



# PRODUCTS AND CAPABILITIES







# PRODUCTS AND CAPABILITIES



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# ABOUT US

ASFAT is a project management company in defence industry that is highly capable of rapidly generating result-oriented solutions based on specific operational requirements, via its wide range of capabilities on air, land and naval platforms as well as infrastructure solutions.

Established on January 12, 2018 under the Ministry of National Defence, as a government owned entity, ASFAT has set out with the mission of bringing the capabilities, experience and excellence of 26 Military Factories and 3 Shipyards in the fields of production, maintenance and repair as well as modernization and sustainability to the national economy through export.

ASFAT, with one of its most important competencies “the ability to generate business models”; generates valid, realistic, applicable and feasible business models; by working with the principle of “completing the best in the shortest time” with its qualified project teams.

Having completed both national and international projects since its establishment, ASFAT is administrated by the Ministry of National Defence of the Republic of Turkey and has a capital that is 100% public. The strength of government administration and public capital, combined with the private sector decision making reflexes and dynamism provides ASFAT with its unique position.

With the products, services and added values, ASFAT provides innovative solutions not only for the Turkish Armed Forces (TSK), but also for the national security of friendly and allied countries. While providing result oriented, innovative and rapid solutions to high-distinguished decision makers and end-user from Turkey and allied countries, ASFAT also aims to improve the already-strong operational excellence via creating a synergy between public and private sectors, and developing facilities, improving capabilities and capacities of military factories and shipyards via significant investments over the revenues of accomplished projects.

Thanks to the dynamism brought by its efficient organization and competent staff with international experience, ASFAT aims to contribute to the strong growth and expansion of Turkish defence industry. Being entitled to sign “Government-to-Government Agreements”, ASFAT not only aims to export its various capabilities, but also aims to plays an active role to ease export processes of products designed, developed and manufactured by Turkish defence industry companies and hence serving as a bridge between the public and private sector. As of today, in addition to the military factories and shipyards, more than 200 private sector companies of different scales are involved in the ASFAT projects, via their wide-range of capabilities and solutions.









# LAND MAINTENANCE FACTORIES







2

ND

**MAIN MAINTENANCE  
FACTORY DIRECTORATE**

## DEPOT LEVEL MAINTENANCE AND REPAIR ACTIVITIES

2<sup>nd</sup> Main Maintenance Factory Directorate provides sustainable and reliable products and services with high quality for defence industry of tracked vehicles.

### TECHNOLOGICAL APPLICATIONS

- Disassembly and Sanding
- Maintenance and Repair
- Spare Parts Preparation
- Spare Part Production
- Hull and Subsystem Assembly
- Painting Process
- Quality Control

### PRODUCT RANGE

M60T TANK



M48 A5T1/T2 TANK



SERIES OF M113



AAPC/ACV



TAMAY M-48 RECOVERY VEHICLE



## ENGINE DEPOT LEVEL MAINTENANCE

Overhaul of 4 and 2 stroke engines, diesel engines of available tracked vehicles in Turkish Armed Forces inventory.

### TECHNOLOGICAL APPLICATIONS

- Hard chrome plating and grinding operations of crank shaft's and camshaft's trunnions through chemical methods
- Special welding method repair and grinding operations of crank shaft's trunnions which has a surface crack
- Cylinder head grinding methods
- Valve grinding methods
- Fuel pump adjustments
- Electric systems of diesel engines adjustment and controls
- Cylinder liner operations
- Cylinder honing operation

### PRODUCT RANGE

■ AVDS 1790 2C/2CA



DETROIT DIESEL 6V53



DETROIT DIESEL 6V53T ■



### ENGINE OVERHAUL AND TESTING ACTIVITIES

■ HYDRAULIC HONING MACHINE



- It is used for honing the AVDS 1790 cylinder.

HIGH-SPEED TURBOCHARGER BALANCING MACHINE ■



- It is used for balancing turbocharger fan blades.

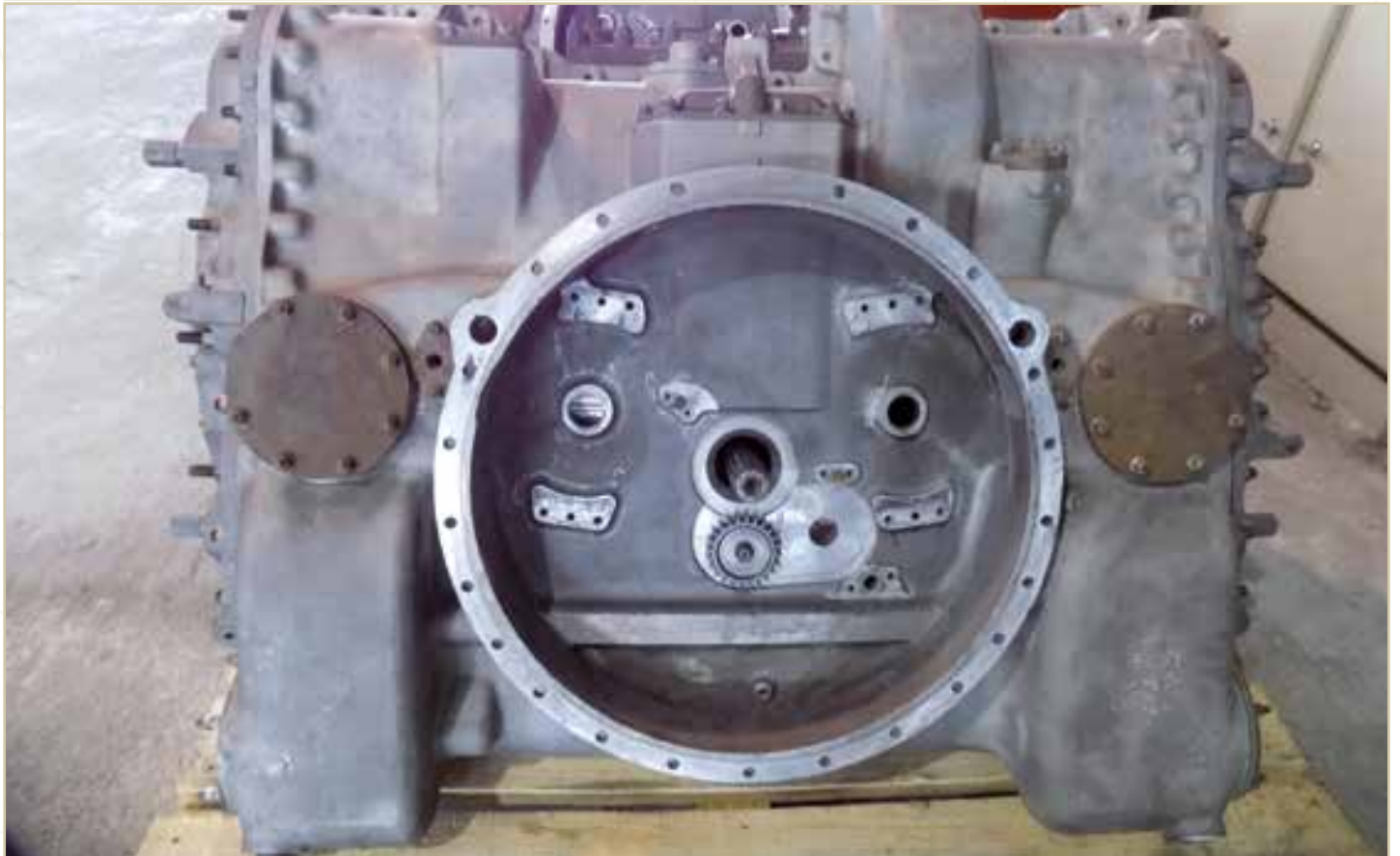
## TRANSMISSION DEPOT LEVEL MAINTENANCE

### TECHNOLOGICAL APPLICATIONS

- Overhaul of transmission body
- Overhaul of transmission covers
- Overhaul of torque converter
- Overhaul of differential
- Overhaul of transmission valve body
- Overhaul of gears (Grinding, bushing and machining)

### PRODUCT RANGE

#### ■ ALLISON CD 850-6A TRANSMISSION



#### ■ ALLISON X200-4 TRANSMISSION



#### ALLISON TX 100-1 TRANSMISSION ■



## ENGINE AND TRANSMISSION TEST UNIT

Performance tests are made for engines and transmissions after overhaul activities are made in the related cells.

### TECHNOLOGICAL APPLICATIONS

Parameters which are checked in the Engine Test Cells:

- Power
- Oil Temperature and Pressure
- Air Suction Pressure
- Fuel Pressure
- Exhaust Gas Temperature
- Exhaust Pressure
- Turbo Pressure
- Turbo Air Inlet Temperature

Parameters which are checked in Transmission Test Cells:

- Power
- Fuel Temperature and Pressure
- Right and Left Movement Capability
- Gear Shifting Ranges



## OVERHAUL OF ELECTRIC AND HYDRAULIC EQUIPMENTS

Maintenance, repair and overhaul activities for Hydraulic and Electrical Systems of tracked vehicles are performed.

### PRODUCT RANGE

#### Hydraulic

- Hydraulic Cylinder
- Hydraulic Pump
- Hydro-Motors
- Servo valve
- Pressure Control Valves
- Directional Control Valves
- Proportional Valves

#### Power

- Power Distribution Boxes
- Cable Harnesses
- Electric Motors
- Lighting and Warning Lamps
- Display Panels
- Heating Systems
- Fire Extinguishing Systems
- Command and Control Panels
- Power Control Systems



### TECHNOLOGICAL APPLICATIONS

#### Hydraulic

- Pressure Test
- Leak Test
- Flow Test
- Torque Test
- Round Test

#### Electric

- Broken and Short Circuit Control
- Precise Soldering
- Relay Contact and Switch maintenance and repair





# OPTICAL MATERIALS OVERHAUL, MAINTENANCE REPAIR AND PRODUCTION

Maintenance, repair and overhaul activities for the optical day vision systems used in tracked vehicles are performed.

## PRODUCT RANGE

### Daytime Surveillance Periscopes

- M17
- M27
- M26
- M336
- M13
- M37
- M45
- M24
- Gepanzert 2A4 Driver Periscope
- Gepanzert 2A4 Gunner Periscope

### Classic Optical Materials

- |                 |                          |
|-----------------|--------------------------|
| M19 Periscope   | M20T Modified Periscope  |
| M24 Periscope   | M28E2 Azimuth indicators |
| M36 Lighting    | M10A6 Ballistic Drive    |
| M120T Telescope | M105 Lighting            |



## TECHNOLOGICAL APPLICATIONS

- Lamination Process
- Thiokol Process
- Polyurethane Bonding Process
- Precise Soldering
- Periscope Vision Test
- Periscope Leak Test



# MANUFACTURING

The capability of manufacturing spare parts for tracked vehicles and other military equipment.

## MACHINE/UNMACHINED MANUFACTURE

### CNC VERTICAL MACHINING CENTERS



The capability of precision machining of spare parts by using Vertical Machining Centers which have 5-axes, automatic turret changing unit and turnplate.

### CNC WIRE EROSION BENCH



The capability of manufacturing cutting molds and some precision spare parts.

### CMM 3D COORDINATE MEASUREMENT MACHINE



The measurement of the hulls laying systems and turrets are checked tracked vehicles out automatically with computer-controlled.

### CNC HORIZONTAL MACHINING CENTER



The capability of precise machining of all tracked vehicles hulls and turrets with using 6-axes.

## MANUFACTURING

### TECHNOLOGICAL APPLICATIONS

- Material analysis of the casting are carried out with atomic emission spectrometry test bench.
- The resin and sand hardener are mixed together automatically in the molding unit.

### Casting capacity of foundry at a time:

- 300 kg iron casting
- 300 kg steel casting
- 300 kg nodular cast iron
- 80 kg aluminum casting
- 300 kg brass casting
- 300 kg bronze casting

### CASTING PROCESS



### CNC Machining Center

- It is used for modelling of material to be cast.



# MANUFACTURING

## TECHNOLOGICAL APPLICATIONS

- **TIG Welding:** the parts for which leaktightness is important this welding method is applied with less temperature.
- **MIG Welding:** It is a welding method which is used for welding the aluminum parts.
- **MAG:** It is a welding method which is used for welding the armor steel parts.
- **Manual Arc Welding:** It is the welding method which provides opportunity to work in open areas.
- **Shielded Carbon Electrode Welding:** It is the welding method which is used for repair of crankshafts.
- **Resistance Welding:** It is the welding method which is used to make point welding with spot weld.
- **Acetylene Welding:** It is the welding method which is used to repair small cracks on the material.

## WELDING PROCESS



### Plasma Cutting Machine

Plasma Cutting Machine that is in size 2m x 6m, is capable of

- Drilling Capacity: 40mm Aluminium ve Stainless Steel, 50mm Sheet Metal Cutting
- Breakout Capability: 50mm Aluminium, 75mm Stainless Steel, 80mm Sheet Metal Cutting



# PLATING AND PAINTING PROCESS

## TECHNOLOGICAL APPLICATIONS

- **Hard Chrome Plating**  
The parts (various engine parts, shafts etc.) which are rusted and lost its standard dimension because of usage are ensured by this activity that they get to standard dimension and provide the required strength.
- **Manganese Phosphate Plating**  
It is performed in order to protect steel and steel alloy materials against corrosion and preparation of the surface for painting.
- **Aluminum Chromating**  
It is performed in order to protect aluminum parts against corrosion and to make preparations for painting.
- **Zinc Plating**  
It is performed in order to protect steel and steel alloy materials against corrosion and provide a decorative view.
- **Silver Plating**  
It is performed in order to increase electrical conductivity of parts by using electrolysis method.

## HEAT TREATMENT PROCESSES

- |                  |               |
|------------------|---------------|
| Normalization    | Aging         |
| Stress Relieving | Carburization |
| Hardening        | Annealing     |
| Tempering        |               |

## TECHNOLOGICAL APPLICATIONS

- Hull and spare parts painting by using heat controlled painting cabin
- Primer and camouflage finishing painting for hull, turret and spare parts
- Static Painting

## PLATING PROCESS



## PAINTING PROCESS



# RUBBER MANUFACTURING

## TECHNOLOGICAL APPLICATIONS

- Silicon Manufacturing  
It is resistant against water.
- Neopren Rubber Preparation (EU)  
It has high electrical insulation capability.
- Styrene Butadiene Rubber (SBR) Preparation  
It is impact resistant.
- Nitrile Butadien Rubber (NBR) Preparation  
It is resistant against oil and fuel.

## PRODUCT RANGE

### ■ PERISCOPE GASKET



### ■ VARIOUS RUBBER MANUFACTURED SAMPLES



### VARIOUS RUBBER MANUFACTURED SAMPLES ■



# MODERNIZATION PROJECT

## PROCESSES APPLIED

- Disassembly and Sanding
- Machining operations on the hull
- Welding operations on the hull
- Painting operations on the parts and hull
- Vehicle assembly operations
- Vehicle road performance and system tests

## FIRE SUPPORT AUTOMATION PROJECT (FSAP)/ NETWORK ENABLED CAPABILITY PROJECT (NECP)



■ M113 NECP



■ M113 FSAP



## MODERNIZATION PROJECTS

### DEVELOPED SYSTEMS

- Hull Additional Reactive Armors
- Turret Additional Reactive Armors
- Fire Control System
- Stabilization System
- Sprocket and Track
- Final Drive
- Engine (1000 BG)
- Transmission
- Tower Ring Gear
- 120 mm Artillery

### M60T PROJECT





# MODERNIZATION PROJECTS

## TECNOLOGICAL APPLICATIONS

- Hull machining operations
- Hull welding operations
- Modification of the components
- Layer system parts;
  - Laying Arm
  - Commander cupola
  - Rear Fixed and Rear moving arm manufacturing
- Support blade welded manufacture
- Fork welded manufacture
- Laying system machining operations
- Laying subsystem assemblies
- Hull and bridge system assemblies
- Vehicles test

## BRIDGE LAYING TANK



## ACTIVITIES OF QUALITY MANAGEMENT DIRECTORATE

### LABORATOIRES OF QUALITY MANAGEMENT DIRECTORATE

#### Physics – Chemistry Laboratory

- Measurement of element values in iron, aluminum and copper based materials by Optical Emission Spectrometer
- Tensile strength tests of materials by pulling – pressing device (up to 30 tons)
- Tensile tests of rubber-plastic materials
- Spring tension and compression tests with spring tension device
- Determining of surface roughness of metallic materials
- Rockwell hardness measurement of metallic materials
- Carbon and Sulphur analysis of casts whose carbon ratio up to %5
- Wet Method Analyses in Chemistry Laboratory

#### Oil Analysis Laboratory

- Test of metal increase in engine and transmission oils by spectrometer
- Analysis of water, soot, oxidation, fuel, antifreeze and nitration values in oils by FT-IR device
- Analysis of viscosity values of oils

OPTICAL EMISSION SPECTROMETER



PULL-PUSH DEVICE



ATOMIC EMISSION SPECTROMETER



VISCOSIMETER



FT-IR SPECTROMETER DEVICE



ATOMIC ABSORPTION SPECTROMETER



## CALIBRATION LABORATORY

Mechanic and Electronic Calibration Laboratories calibrate and control measuring instruments used in military units supported by these laboratories according to determined standards. Moreover, they have international traceability.

### Electric – Electronic

- Multimeters, Analog & Digital (Up to  $7^{1/2}$  Digit)
- Oscilloscopes, Analog & Digital (Up to 600 MHz)
- Spectrum Analyzer (Up to 2 GHz)
- Frequency Meters (Up to 2 GHz)
- LCR Meters
- Clamp Meters (Up to 450A, AC & DC)
- AC & DC Power Sources

### Oscilloscopes

- Digital and analog oscilloscopes are calibrated.
- In accordance with Technical Order, measured values of oscilloscopes are calibrated up to 600 MHz.

### Frequency Meters

- Frequency meters are calibrated.
- In compliance with the Technical Order, measured values of frequency meters are calibrated up to 2 GHz.

### Multimeters

- Digital and analog multimeters are calibrated.
- In accordance with Technical Order, measured values of multimeters are calibrated.



## CALIBRATION LABORATORY

### Dimensional

- Micrometers
- Calipers
- Surface gauges
- Comparator/Dial Indicator
- Protractors
- Water Balances

### Pressure

- Air Manometers (0-1000 Bar)
- Oil Manometers (0-1200 Bar)

### Pressure Measurement Testing Device

- It is used for Gas Manometer's ((-1)-1600 bar) calibration.

### Force

- Torque (0-2000Lbft)

### Temperature

- Thermometers and temperature indicators
- Moisture Meters



## DRIVE TESTING CAPABILITIES

Within the scope of maintenance, repair, overhaul and modernisation activities of our factory final inspection and test activities are performed for all tracked vehicles.

Following tests are performed for the tracked vehicles in the tank test areas numbered 1 and 2:

- Road Test, Braking and Acceleration
- %60-%45 steep slope
- %30 side slope
- Water Crossing
- Vertical obstacle Crossing
- Trench Crossing
- Slalom test
- Fire control system test
- Stabilization test



## NON-DESTRUCTIVE INSPECTION TEST AND CAPABILITIES

Non-destructive inspection operation are executed in compliance with the contracts signed between 2<sup>nd</sup> MMFD and customers.

- **Magnetic Particle Control:** 6000 Ampers AC, DC ve HWDC with 30 cm diameter and 2 m height of machine, ferromagnetic materials crack control
- **Penetrant Control:** Crack Control of all types of metal and nonmetal materials (wood and sponge excluding)
- **X-ray Control:** Crack Control of steel materials up to 5 cm thickness with 300 KWP machine
- **Ultrasonic Control:** Crack Control of metallic and nonmetallic materials with a thickness up to 1 m

PENETRANT CONTROL



MAGNETIC PARTICLE CONTROL



ULTRASONIC CONTROL



X-RAY CONTROL



# CERTIFICATES

## EFQM

RECOGNISED FOR EXCELLENCE 3 STAR

## AQAP-2110

NATO QUALITY ASSURANCE REQUIREMENTS FOR DESIGN, DEVELOPMENT AND MANUFACTURING

## ISO 45001

OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT SYSTEM

## ISO 14001

ENVIRONMENTAL MANAGEMENT SYSTEM





4  
TH

MAIN MAINTENANCE  
FACTORY DIRECTORATE



## SURVEY ACTIVITIES

For weapons, communication, electronic and information systems requirements in its field, 4<sup>th</sup> Main Maintenance Factory Directorate conducts engineering services, plans, controls, carries out and follows all the projects executed in 4<sup>th</sup> Main Maintenance Factory Directorate takes precautions to simplify the production, determines needs to support the ordnance newly entered to the inventory and prepares project offers.

### FORMING AN INFORMATION PACKAGE

- Preparing technical drawings of main materials, spare parts, apparatus and tools to be manufactured in compliance with principles and procedures determined according to standards
- Supply scouting for main materials, spare parts, apparatus and tools to be manufactured
- To determine manufacture method and preparation of information package

### MECHANICAL DESIGN

Mechanical part designs required for integration and development projects by using Computer Aided Design – (CAD) software

### ACTIVITIES WITH PROJECT

- Planning, controlling and following all executed projects by system engineers
- Executing comprehensive engineering services to develop maintenance, repair and manufacture possibilities and capabilities related to their specialty



## SURVEY ACTIVITIES

### DESIGN ACTIVITIES

- MPT-76 National Infantry Rifle Rack Design
- Machine Gun Stand Work
- 20mm Oerlikon integration to armoured pick-up vehicles (Not used weapons in the Navy Inventory are transferred to the Land Forces in order that they are used in operations.)
- Weapon system with stand (Weapons in the Air Force Inventory becoming useless because of F4 and F5 aircrafts' becoming scrap are transferred to the Land Forces to be used.)
- Surveillance System design for old generation Cobra
- Energy Bag Design



### SYSTEMS FOLLOWED

- Weapon Systems
- Radar Systems
- Electronic Systems
- Electronic Warfare Systems
- Mine Detector Systems



## MANUFACTURE ACTIVITIES

4<sup>th</sup> Main Maintenance Factory Directorate performs design and manufacture activities for light weapons and subassemblies/parts & spare parts of communication, electronic and information systems in its responsibility field.

Furthermore military paints which are used for painting military vehicles, equipment and weapons are manufactured.

### TECHNOLOGICAL APPLICATIONS

- Part modeling and design with computer-aided Design (CAD) (3D)
- CNC machine processing program with computer-aided manufacture (CAM)
- Forming aluminium, steel sheet materials in molds with the pressing machine
- Plastic parts manufactured by injection method
- Rubber paste is molded in the pressing machines in order to obtain finished goods.
- Mold and part manufacture in CNC wire and immersion erosion machines
- Spring winding up to 2,5 mm wire diameter in CNC machine
- Writing on metal with laser stand
- Dimension measurement activities with computerised 3D laser

### MACHINING

For various spare parts and electronic materials of light weapons:

- Processing in 5 axis-CNC machine
- Manufacture with turning, milling, drilling, bending and grinding methods
- Welding activities for aluminum and steel materials with tig, mig, electrode and oxygen welding machine

### HEAT TREATMENT PROCESSES

- Normalisation
- Stress Elimination
- Hardening
- Tempering
- Aging
- Cementation
- Annealing

### COATING PROCESSES

- Hard Chrome
- Black Chrome
- Nickel Sulphamate
- Zinc Coating
- Black Oxide
- Manganese Phosphate
- Copper
- Sulphuric Acid Anodized
- Silver

### OTHER PROCESSES

- First product manufacture with 3D printer
- Electro static powder and lac-dying
- Sanding with steel ball

## MANUFACTURE ACTIVITIES

### PAINT MANUFACTURE

#### IR Paint

- Concealment against night vision devices
- Appropriate for MIL-C-46168D standard
- Manufactured as polyurethane resin-based and binary component
- Brown 383,30051
- Green 383,34094
- Black 37030
- Earth Yellow 33245,
- Skin 686,33440
- Aircraft 36300 coloured IR paints are produced.

#### Advantages

- Resistance against atmospheric conditions (aerospace)
- Chemical strength (alkaline, acid)
- Light sensitivity
- Five-year (5) service life after application

#### Laboratory Tests

- Appearance
- Thickness degree
- Viscosity
- Application
- Covering Strength
- Drying
- Coating Strength
- Sticking
- Flexibility
- Brightness

#### Epoxy Primer

- It is used for polyurethane paint application.
- It is produced in compliance with MIL-PRF-23377J standards.

#### Polyurethane Paint

- Its colors are gray, white, red, bright white, black and produced in compliance with MIL-PRF-85285 standard.



## QUALITY MANAGEMENT ACTIVITIES

4<sup>th</sup> Main Maintenance Factory Directorate gives priority for customer satisfaction and the system certificates. The certificate awarded to the factory is AQAP 2110 NATO Quality Assurance Requirements for Design, Development and Manufacture.

### PHYSIC, CHEMISTRY AND METAL LABORATORY

#### Paint/paint raw material analysis

- Covering/Coating strength, Brightness, Volatile Material Amount, Viscosity determination with Brookfield and Krepes Devices, Touch/ Dryness/Dust collection determination, density, pH analysis etc.

#### Coating Chemicals and Solvents Analysis

- Density, melting, boiling point determination specified in the national and international standards, pH Analysis etc.

#### Process Control Test and Analysis

- Chemical Coating Analysis (Phosphate, Chrome, Nickel, Anodized, Rust elimination and oil elimination and activation bath)

#### Metal/Plastic Analysis

- Spark-OES, Elemental analysis of steel, aluminum and copper alloys with Carbon-Sulphur Device
- According to TS EN ISO 6507-1-2-3 and TS EN ISO 6508-1 hardness analysis with Rockwell Hardness device and Vickers Micro-hardness device
- According to TS EN ISO 6892-1-2, tensile & rupture strength of metal materials with 20 kN Tensile - Rupture Test Device
- According to TS ISO 37, tensile & rupture strength of plastic materials with 1kN tensile – rupture test device
- Shore A Hardness Analysis of Plastic Materials with Durometer



## REPAIR ACTIVITIES

4<sup>th</sup> Main Maintenance Factory Directorate performs design and manufacture activities for light weapons and subassemblies/parts & spare parts of communication, electronic and information systems in its responsibility field.

### FREQUENCY MODE RADIO REPAIR

#### SK2 Radio Family (1<sup>st</sup> Generation)

- 4014 / 4018 VHF / UHF Handheld Radio
- 4411 / 4415 VHF /UHF Handheld Radio
- 4024 / 4028 VHF / UHF Vehicle Radio
- 4034 / 4038 VHF / UHF Base Radio Station
- 4841 / 4845 VHF / UHF Relay + SK Card

#### SK2 Radio Family (2<sup>nd</sup> Generation)

- 4711 / 4715 VHF / UHF Handheld Radio
- 4721 / 4725 VHF / UHF Vehicle Radio
- 4731 / 4733 VHF Base Radio Station
- 4735 / 4737 UHF Base Radio Station
- 4441 / 4445 VHF / UHF Repeating Radio
- 4741 Repeating Radio
- 4742 VHF Mobile Repeating Radio
- 5712 Squad Radio
- 4900 EHHAS Handheld Radio
- VRC 9611 5 Watt Vehicle Radio
- VRC 9612 50 Watt Vehicle Radio
- VRC 9613 5+5 Watt Vehicle Radio
- VRC 9614 5+50 Watt Vehicle Radio
- VRC 9615 50+50 Watt Vehicle Radio
- VRC 9621 5 Watt Armoured Vehicle Radio
- VRC 9622 50 Watt Armoured Vehicle Radio
- VRC 9623 5+5 Watt Armoured Vehicle Radio
- VRC 9624 5+50 Watt Armoured Vehicle Radio
- VRC 9625 50+50 Watt Armoured Vehicle Radio
- 9661 V/UHF Software-based manpack radio/Vehicle and Base Radio Station
- 9651 Software-based Handheld Radio



## REPAIR ACTIVITIES

### AMPLITUDE MODE RADIO REPAIR

- MARCONI and HARRIS series radios
- They are used as vehicle radio and base radio. They can provide safe ground wave and skywave communication.
- 9661 HF software based manpack/vehicle and Base Radio Stations.



## REPAIR ACTIVITIES

### REPAIR OF MULTI-CHANNEL COMMUNICATION SYSTEMS

It is a mobile communication system which was designed domestically to meet the voice, data and video communication needs of the TAF users from the battalion levels to the army levels.

- PRC 5114 personal communication switchboard (225-400 MHz.)
- Aselsan GRC 5520 micro wave receiver transmitter
- TASMUS G+ magn mobile subscriber input switchboard
- E-VOiP 2121 safe voip telephone
- VRC 5101 mat/M radio mobile subscriber terminal M radio (225-400 MHz.)
- VRC 9661 M radio
- TASMUS (Tactical Field Communication Systems) MAGN shelter





## REPAIR ACTIVITIES

### RADAR REPAIR

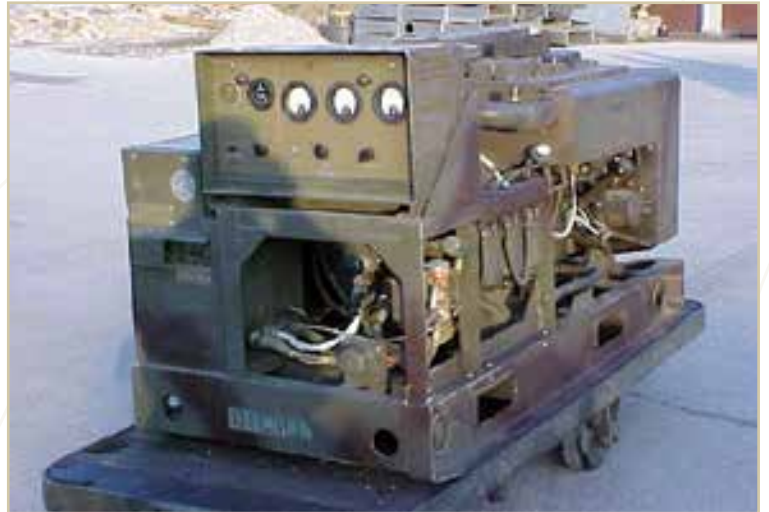
- AN/TPQ-36 radar detects the location of enemy mortars, artillery and rockets.
- COBRA radar detects the location of enemy mortars, artillery and rockets.
- AN/MPQ-64 Radar tracks the aircrafts and sends their print information.
- First Speed Measurment Radar measures the first artillery speeds of heavy weapons.
- GPS device sends the coordinates and altitude information of its location.
- P-Star radar tracks the aircrafts and sends their print information.



## REPAIR ACTIVITIES

### GENERATOR REPAIR

- Meets the energy need of MEP-112A, AN/TPQ-36 V9 Radar ( 110-208V 400HZ 10KVA)
- Meets the energy need of GENPOWER GYM-10, AN/TPQ-36 V9 Radar 110-208V 400HZ 10KVA)
- Meets the energy need of MEP-813, AN/TPQ-36 V8 and AN/MLQ-64 Radar (110-208V 400HZ 10KVA )
- Meets the energy need of WHECSELS, COBRA Radar (380V 50HZ AC-28V DC output 40KVA)



# REPAIR ACTIVITIES

## ELECTRONIC WARFARE SYSTEMS

- AT-02 G Manpack Snow/Blind System
- AT-03 Self Contained Jammer System for Vehicle Protection
- AT-11 Manpack Snow/Blind System
- AT-22A Manpack Snow/Blind System
- ELKAR Radio Frequency Jamming System
- KANGAL RF Jamming Attenuation (Jammer) System
- MILKAR 5T5 Portable Jammer Attenuation System
- MILKAR 3A Jamming System
- MILKAR-4 Jamming System
- MILKAR 5A2 Jamming System
- MILKAR-5A4 Jamming System
- MILKAR-5A5 Active/Passive Convoy Protection System
- MILKED 3A2 Listening and Direction Finding System
- MILKED 3T2 Listening and Direction Finding System
- MILKED-3T4 Portable V/UHF Listening and Direction Finding System
- MILKED 4A Listening and Direction Finding System
- RADAR Electronic Support (ED) System
- RADAR Electronic Attack (ET) System
- SIRTOKAR 2300 B0 Manpack Jammer



## REPAIR ACTIVITIES

### MINE DEDECTORS

With high accuracy and precision mine Detector detects explosives under the soil and shallow water, plastic mines, bombs, munitions and other objects.

- Vallon VMH3 Mine Detector
- Vallon Mine Detector
- Schiebel Mine Detector
- Portable Mine Detection System-2 (ETMTS-2)
- Portable Mine Detection System -2 (ETMTS-3)
- CEIA Mine Detector



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735

# REPAIR ACTIVITIES

## REPAIR OF MATERIALS MANUFACTURED BY FACTORY

- Radio Controlled Target System
- Moving Target System
- Tank audio warning system
- Wide band antenna (MARCONI)
- Radio controlled infantry rifle night fire lighting system
- LEOPARD 2A4 tank fire simulator
- Charger (Micro processor card)
- Rapid Charge/Discharge device (HŞDC-4)
- Under vehicle searching device (AAC-700)
- Under vehicle searching device (AAAC-700)
- Unit Security Systems (BGS-700)
- Unit Security Systems (BGS-4)



## REPAIR ACTIVITIES

### SWITCHBOARD AND TELEPHONE REPAIR

DIGINET DX-1/2/3 Switchboard family

- DX-1A ARCADE
- DX-1G GALLERY
- DX-2B BUSINESS
- DX-2C COMPANY
- DX-3 PLAZA

KAREL switchboard family

- MS 38
- MS 48
- MS 128
- DS 200
- IPG 1000

SAHRA switchboard

- 30 subscribers, 2 CO lines, 2 PRI lines



## LIGHT WEAPON RENOVATION ACTIVITIES

4<sup>th</sup> Main Maintenance Factory Directorate performs renovation of light weapons in its responsibility area. Renovation activities include examination of weapons by disassembly of all parts even the smallest ones, making the failed parts operable or replace them with the new, renovated or repaired ones and then re-assembling such parts and bring them into a good condition where they can be comparable to the new ones.

### RENOVATED WEAPONS

#### Infantry Rifles

- 7,62 mm G3A3/G3A4 Rifle
- 7,62 mm AK-47 Kalashnikov Rifle
- 5,56 mm HK33 Rifle

#### Machine Guns

- 7,62 mm MG3 Machine Gun
- 7,62 mm PKMS (Bixi) Machine Gun
- 7,62 mm FN Machine Gun
- 12,7 mm Anti-aircraft Machine Gun (M2,M3,M85)

#### Bomb Launchers

- 40 mm MK19 Bomb launcher
- 40 mm T40 Bomb launcher
- 40 mm Drum bomb launcher

#### Sniper Rifles

- 7,62 mm Dragunov Kannas Sniper Rifle
- 8,59 mm Accuracy Sniper Rifle

#### Mortars

- 60 mm Mortar
- 81 mm Mortar
- 106 mm Mortar
- 120 mm Mortar

#### Roket Launchers

- 40 mm RPG7 Rocket Launcher
- 107 mm multi launcher rocket system

#### Pistols and Machine Pistols

- 9 mm MP5A3 Machine Pistol
- Various Pistols



## LIGHT WEAPON RENOVATION ACTIVITIES

### TECHNOLOGICAL APPLICATIONS

- Adjusting line of fire with aiming sight
- Changing barrel activities by using barrel pressing, fixing and drilling machines
- Adjusting headspace process
- Balancing weapons by balancing machine
- Fixing front sight operation by front sight fixing machine
- Oxygen and gas welding operations
- Making weapons ready by sanding machine before phosphate coating and lac-dye painting process
- Phosphate coating and lac-dye painting process
- In 25 mt polygon executing firing tests of rifles, machine guns and various pistols by fixing on gun rest. Firing tests of weapons like anti-aircraft weapons, machine guns which can not be performed in the shooting range are done in open shooting areas that Turkish Land Forces have.





## CERTIFICATES

### AQAP-2110

NATO QUALITY ASSURANCE  
REQUIREMENTS FOR  
DESIGN, DEVELOPMENT AND  
MANUFACTURING





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**MAIN MAINTENANCE  
FACTORY DIRECTORATE**

## OVERHAUL ACTIVITIES

Maintenance, repair, overhaul and test activities of engines, powertrain of the Tactical Wheeled Vehicles and generators, explosive ordnance disposal robot systems and sub-systems, which belong to Turkish Armed Forces inventory and in the 6<sup>th</sup> Main Maintenance Factory Directorate's responsibility area are made by using automated technology.

It includes the services of disassembly, repair and replacement/renovation of engines, transmissions, transfers, differentials, axles of Tactical Wheeled Vehicles which are in a defective state or that have a predetermined overhaul time and it is ensured that the systems or materials on which those activities are applied are brought to a good condition level where they could be comparable to the new ones.

### VEHICLES

■ KIRPI



COBRA



MERCEDES TANK ■  
TRANSPORTER



■ 1,5-2,5 TONS  
MERCEDES



LODER MASTAŞ  
HİDROMEK



VOLAT TANK ■  
TRANSPORTER



■ 2,5-5-10 TONS  
BMC



DOZER CAT  
GREYDER CHAMPION



10 TONS RECOVERY ■  
VEHICLE M984 A2



■ 5-10 TONS  
MAN



LANDROVER  
110-130 SERIES



LANDROVER ■  
DEFENDER SERIES



## ENGINE OVERHAUL

It includes the services of overhaul, maintenance and test, repair and modernization of Tactical Wheeled Vehicle, Tactical Wheeled Armored Vehicle and heavy duty vehicle engines, marine engines, generator engines, compressor engines.

### PRODUCT SPECTRUM

COBRA ENGINE



MERCEDES UNIMOG ENGINE



KIRPI ENGINE



BMC ENGINE



GENERATOR ENGINE



LANDROVER DEFENDER ENGINE



TANK TRANSPORTER ENGINE



HEAVY DUTY VEHICLE ENGINE



BORDO MARINE ENGINE



COMPRESSOR ENGINE



### ENGINE ASSEMBLY LINE-1



# ENGINE OVERHAUL

## TECHNOLOGICAL APPLICATIONS

- Disassembly and assembly operations along the conveyor line supported by sensors
- Test, adjustment and troubleshooting operations with the fault detection and diagnostic devices used in new generation electronic controlled vehicle engines (ECU)
- Rectification, honing and crank grinding applications
- Nondestructive testing (magnetic, ultrasonic) operations for the crack inspection on cylinder heads and engine blocks
- Test operations of parts made of ferromagnetic materials such as iron, nickel, cobalt and some alloys thereof at 20-240 cm in length and 2-63 cm in diameter and 620 kg in weight with a magnetic particle test device



ENGINE ASSEMBLY LINE-2



## POWERTRAIN OVERHAUL

It includes the services of overhaul, maintenance and test, repair and modernization of Tactical Wheeled Vehicle, Tactical Wheeled Armored Vehicle, Heavy-Duty Vehicles and Tank Transporter Vehicles transmissions, differentials, axels, transfers.

### TECHNOLOGICAL APPLICATIONS

- Disassembly, modernization and assembly operations on conveyor lines
- Test operations on modern test benches
- Test, adjustment and troubleshooting operations with the fault detection and diagnostic devices used in new generation electronic controlled vehicle transmissions

### PRODUCT SPECTRUM

AUTOMATIC TRANSMISSION



TRANSFER



TACTICAL WHEELED VEHICLE AXLE



MECHANICAL TRANSMISSION



### POWERTRAIN ASSEMBLY LINE



## GENERATOR OVERHAUL

It includes the services of overhaul, maintenance and tests, repair and modernization of various generators at diesel and gasoline-powered type whose powers range is between 5,5 KVA (not including 5,5 KVA) and 1500 KVA, it also includes part repair and replacement services.

### PRODUCT SPECTRUM

#### MANUAL GENERATOR



#### DUAL GENERATOR



### TECHNOLOGICAL APPLICATIONS

- Design and overhaul of standardized control and power panels appropriate to generators' power
- Performance test operations of overhauled generators with charge banks

#### AUTOMATIC GENERATOR



## EXPLOSIVE ORDNANCE DISPOSAL ROBOT REPAIR AND OVERHAUL

It includes the services of overhaul, maintenance and tests, repair and modernization of bomb disposal robots on brand of Telexmax and Teodor besides parts repair and replacement services.

### PRODUCT SPECTRUM

TELEXMAX EXPLOSIVE ORDNANCE DISPOSAL ROBOT



TEODOR EXPLOSIVE ORDNANCE DISPOSAL ROBOT



ELECTRONIC CARD MODULE TEST DEVICE





# SUB-SYSTEM OVERHAUL

It includes the services of overhaul and test of sub-systems which belong to tactical wheeled vehicles and tactical wheeled armored vehicles.

## PRODUCT SPECTRUM

■ ALTERNATOR



HUB



STEERING PUMP ■



■ TORQUE CONVERTER



TRANSMISSION CONTROL MODULE



PARKING BRAKE UNIT ■



■ TURBOCHARGER



OIL RADIATOR



OIL PUMP ■



■ INJECTOR



FUEL PUMP



COOLANT PUMP ■



## SUB-SYSTEM OVERHAUL

### TEST BENCHES USED IN TESTING

■ PNEUMATIC COMPRESSOR TEST MACHINE



TURBOCHARGER ■ TEST MACHINE



■ COMMON RAIL FUEL PUMP TEST MACHINE



CRANKSHAFT ■ MEASUREMENT BENCH



# MANUFACTURING ACTIVITIES

It includes the operations of cutting, bending, plastering of spare parts used in either engine, powertrain and generator overhaul activities or various vehicles, as well as mold manufacturing at 3 and 5 axis CNC and conventional machines.

## TECHNOLOGICAL APPLICATIONS

- Arc welding, TIG welding, oxy-acetylene welding and MIG-MAG welding, soldering operations
- Cutting capability at the desired design with computer controlled plasma/oxy-acetylene optical cutter for iron, steel, brass and chrome-nickel materials
- Static and dynamic balance adjustment on rotary components like brake disc, pressure plate, involutes etc.
- Turning in 5 and 3 axis CNC, milling, CNC plunge erosion, NC surface/cylinder grinding and leveling applications
- Chemical test capability using Carbon-Silica device

## PRODUCT RANGE

LANDROVER FLYWHEEL



BRAKE DISC



CYLINDER BARREL



FORK GEAR



REAR GEAR COVER



HYDRAULIC AND FUEL PUMP



AXLE CONNECTION



HUB



## MANUFACTURING ACTIVITIES

### PRODUCT SPECTRUM



### TECHNOLOGICAL APPLICATIONS

- Casting Operations
- Cast iron, nodular cast iron, aluminum, bronze and brass casting capability
- Monoblock (single piece) casting between the capacity of 50 g and 850 kg
- Metal melting with the system which has 500 kg and 350 kg crucibles and 1350 kg melting capacity by 2 unrelated inductions

### METALLURGY WORKSHOP



# MANUFACTURING ACTIVITIES

## MACHINES USED IN MANUFACTURING ACTIVITIES

■ HARDENING WITH INDUCTION MACHINE



■ CNC PLUNGE EROSION MACHINE



■ CNC TURNING LATHE



■ CNC VERTICAL MILLING MACHINE



■ 5-AXIS CNC MACHINE



■ CNC GRINDING MACHINE



## TEST ACTIVITIES



### TECHNOLOGICAL APPLICATIONS

- All kinds of test software, test cell design and manufacturing
- Capability to simulate the disassembled and overhauled engine – powertrains – generator – sub-systems at different revolutions and loads by automatic controlled computerized test benches
- Capability of monitoring 24 different parameters like revolution, torque and temperature of engines, cooling water temperature, lube oil temperature, fuel temperature and pressure, exhaust temperature, brake water temperature and pressure

TEST CELL UNIT PRODUCED BY 6<sup>TH</sup> MAIN MAINTENANCE FACTORY DIRECTORATE



TEST CELL UNIT



AUTOMATIC TRANSMISSION TEST CELL UNIT



AUTOMATIC TRANSMISSION TEST CELL UNIT



## RESEARCH AND DEVELOPMENT ACTIVITIES

Overhaul, test, production in the responsibility area, process control system design and manufacturing, software development and modernization activities are performed by the Technical Project and Management Directorate.

### PRODUCT RANGE

#### ENGINE TEST CELLS



### TECHNOLOGICAL APPLICATIONS

- PLC based process control system design
- Engine test cell design and manufacturing
- Transmission test cell design and manufacturing
- Turbocharge test bench design and manufacturing
- Transmission control module test bench design and manufacturing
- Viscose test bench design and manufacturing
- Oil pump test bench design and manufacturing
- Torque converter repair and test bench design and manufacturing
- Design and production of conveyor lines of production lines
- Design and production of Sandblasting Unit
- Design and production of Dismantling and Mounting of Run-Flat Tire Machine

#### CONVEYOR LINE



#### OIL PUMP TEST BENCH



# RESEARCH AND DEVELOPMENT ACTIVITIES

## PRODUCT SPECTRUM

■ TORQUE CONVERTER TEST BENCH



■ VISCOSE TEST BENCH ■



■ DISMANTLING AND MOUNTING OF RUN FLAT TIRE MACHINE



■ SANDBLASTING UNIT





# CALIBRATION ACTIVITIES

## MECHANICAL CALIBRATION PRODUCT RANGE AND TECHNOLOGICAL APPLICATIONS

### DIMENSIONAL CALIBRATION SET



- At 0.01 Micrometer Resolution
- 0-700 mm Measurement Range

### CALIBRATED DEVICES



CALIPER

COMPARATOR

SCREW GAUGE

RING GAUGE



MICROMETER

MARKING GAUGE

BLOCK GAUGE

### TORQUE METER CALIBRATION SET



- 0-2000 ft/lb Measurement Range
- Manual and Digital Torque Meter Calibration
- At 0.01 inch/oz Resolution

### CALIBRATED DEVICES



CLICK-TYPE TORQUE METER

DIRECT READING TORQUE METER

SCREWDRIVER TORQUE METER

### PRESSURE CALIBRATION SET



- -1 and 1200 bar Measurement Range
- At 0.005 bar Resolution
- Gas, Liquid, Vacuum and Reference Meters are measured.

### CALIBRATED DEVICES



LIQUID MANOMETER

VACUUMMETER

REFERENCE MANOMETER



GAS MANOMETER

# CALIBRATION ACTIVITIES

## ELECTRONIC CALIBRATION PRODUCT RANGE AND TECHNOLOGICAL APPLICATIONS

### SIGNAL SOURCES AND ANALYZER CALIBRATION SET AND ITS CAPABILITIES



THE CALIBRATION OF SIGNAL AND SPECTROMETER IN THE RANGE OF FREQUENCY: 1 HZ – 20 GHZ  
LEVEL: -127 dBm, +25 dBm

### CALIBRATED DEVICES



- Modulation Analyzer
- Distortion Analyzer
- Spectrum Analyzer
- Audio Analyzer
- Signal Generator
- RF Communication Test Set
- Test Oscilloscope

### OSCILLOSCOPE CALIBRATION SET AND ITS CAPABILITIES



THE CALIBRATION OF ANALOG AND DIGITAL OSCILLOSCOPE TO 600 MHZ

### CALIBRATED DEVICES



- Analog Oscilloscope
- Digital Oscilloscope

### MULTIMETER CALIBRATION SET AND ITS CAPABILITIES



DC VOLTAGE: 0-1000 V  
DC CURRENT: 20  $\mu$ A – 550A  
AC VOLTAGE: 1 mV – 1000 V  
AC CURRENT: 200  $\mu$ A – 550A  
RESISTANCE: 0 $\Omega$  – 200m  $\Omega$   
CAPACITY: 0,33 Nf – 1,1 mF  
INDUCTANCE: 10 mH-100 Mh  
TEMPERATURE: -200  $^{\circ}$ C – 1200  $^{\circ}$ C

### CALIBRATED DEVICES



- Voltmeter
- Ammeter
- Pensammeter
- Digital Multimeter
- Analog Multimeter
- Thermometer

### FREQUENCY COUNTER CALIBRATION SET AND ITS CAPABILITIES



THE CALIBRATION OF 1 HZ – 20 Ghz FREQUENCY COUNTERS

### CALIBRATED DEVICES



- Frequency Counter
- Microwave Counter
- Universal Counter

### RLC AND AC/DC POWER SOURCE CALIBRATION SET AND ITS CAPABILITIES



THE CALIBRATION OF DC VOLTAGE: 0 – 1000 V  
DC CURRENT: 0 A – 10 A  
AC VOLTAGE: 0 – 1000 V  
AC CURRENT: 0 A – 10 A  
RESISTANCE: 0  $\Omega$  – 330M  $\Omega$   
CAPACITY: 0.33 nF – 1.1 mF

### CALIBRATED DEVICES



- Power Supply
- AC Power Source
- Megaohmmeter
- RLC Meter
- Earthing Test Devices

## LABORATORY ACTIVITIES

### TECHNOLOGICAL APPLICATIONS

- Calibration possibility of Signal Sources, Multimeter, Signal Analyzers, Time and Frequency Counter, Oscilloscope Devices
- Calibration possibility of Torque meter, dimensional (Caliper, Comparator, Block Gauge, Micrometer, Height Gauge) and Pressure (Manometer) devices
- In situ hardness measurement by Rockwell-Brinell and Vickers hardness measurement devices in the laboratory
- Determination of chemical composition of steel, bronze, cast iron, brass and aluminum alloys by Optical Emission Spectrometer Device
- Micro structure examination and determination of cementation thickness, grain size, graphite form and size in the image analysis device; taking photos of micro structure
- Viscosity measurements of oils, density measurements of liquids, PH values measurement of solutions



## CERTIFICATES

### AQAP-2110

NATO QUALITY ASSURANCE  
REQUIREMENTS FOR DESIGN,  
DEVELOPMENT AND MANUFACTURING

### TS-11954 / TS-12047

ENGINE DISASSEMBLY FACILITY  
QUALIFICATION CERTIFICATE  
MOTOR VEHICLE MAINTENANCE FACILITY  
QUALIFICATION CERTIFICATE





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**MAIN MAINTENANCE  
FACTORY DIRECTORATE**

## MOBILE FIELD UNITS MANUFACTURING ACTIVITIES

For 27 years, a total of 2.157 units were produced and submitted to the Turkish Armed Forces (TAF) inventory (donated to 103 friendly and allied nations), 5 types of mobile unit are already in production capability and can be manufactured if requested.

- Mobile Field Kitchen Units
- Mobile Field Bath Units
- Mobile Field Bakery Units
- Mobile Field Laundry Units
- Cold Air Cabinets with Trailer



## MOBILE FIELD UNITS MANUFACTURING ACTIVITIES

### NEW PRODUCTIONS

Trailer mounted cold storage container designed as an alternative to existing 9 m<sup>3</sup> trailer cold air cabinets in the inventory for the purpose of storing food and beverages within the scope of the operations carried out, with a volume of 25 m<sup>3</sup> (15,5 m<sup>3</sup> vegetables and 9 m<sup>3</sup> meat section) and a cooling capacity in the range of -18 degrees to +5 degrees, provides a higher technology and long life to serve the needs of the unit.



## ON-VEHICLE MOUNTED UNITS

Mobile Field Furnaces and Laundry Units can be used on various types of vehicles.

- 10 Tons Tactical Wheeled Man Truck-Mounted Units
- 25 Tons BMC Truck-Mounted Units
- 25 Tons Mercedes Truck-Mounted Units
- 25 Tons Ford Truck-Mounted Units





## MOBILE FIELD UNITS FACTORY LEVEL REPAIR / MODIFICATION ACTIVITIES

The factory level repair and modification activities of the 5 main units in the inventory of Turkish Armed Forces have been carried out since 2003.



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## MOBILE FIELD UNITS MODERNIZATION ACTIVITIES

Units that are mounted on old generation vehicles which expire their economic and physical life and which cannot be used effectively in the field of operation are transferred to vehicles of a new generation with high mobility.

BEFORE



NOW



BEFORE



NOW



LAUNDRY VEHICLE



BAKERY VEHICLE



# MOBILE FIELD UNITS DEVELOPMENT AND DESIGN ACTIVITIES

The design and development processes of container-mounted trailer and / or vehicle units are carried out as a continuous activity in order to make the field units suitable for today's conditions and to use more effectively in accordance with the needs of the units in the operation areas.

- Factory-produced Container-mounted 10 Bath Units with shower (with Vehicle)
- Factory-produced Container-mounted 6/8 Bath Units with shower (Without Vehicle)



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## MOBILE FIELD UNITS DEVELOPMENT AND DESIGN ACTIVITIES

Bathroom units that are developed for shower needs which are one of the important staff needs are improved by using different materials and in types according to the requirements of the military unit and the land conditions.

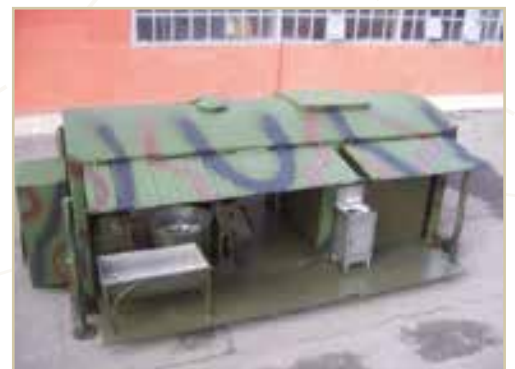
- Market-Type  
Container-mounted 8  
Bath Units with  
shower
- Trailer-mounted  
4 Bath Unit  
with shower



# MOBILE FIELD UNITS DEVELOPMENT AND DESIGN ACTIVITIES

Container type oven unit is designed to be mounted on the vehicle with a hydraulic foot and can be installed on the vehicle in order to meet the bread needs of the troops in the field.

- Oven Mounted to a Unit with Hydraulic Foot Container



## MOBILE FIELD UNITS DEVELOPMENT AND DESIGN ACTIVITIES

There is also a trailer mounted toilet/shower unit for meeting toilet and short shower needs, a single bathroom cabin that can be mounted externally to modular living room containers and a single modular toilet cabinet that can be used around the living area.

- Trailer-mounted 2/4 Cabinet Toilet
- Single bathroom cabin that can be mounted externally to modular living room containers
- Single modular toilet cabinet



## DESIGN ACTIVITIES FOR OPERATIONS

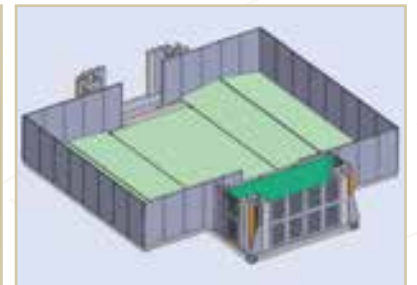
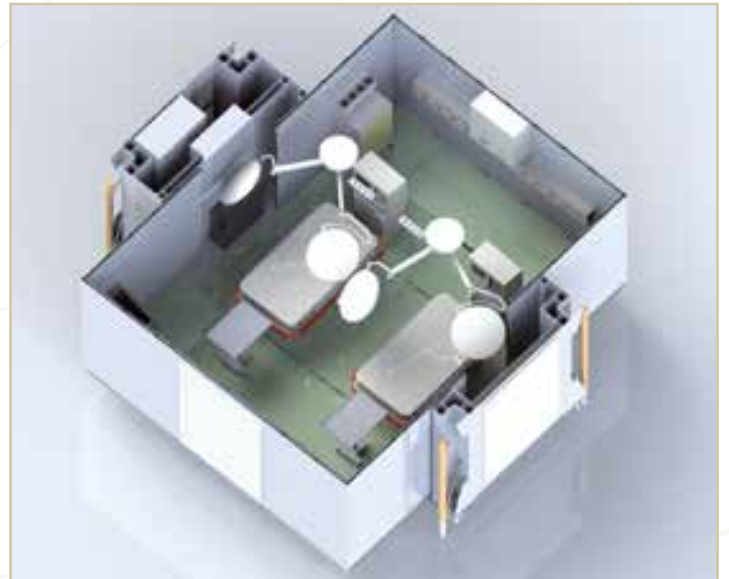
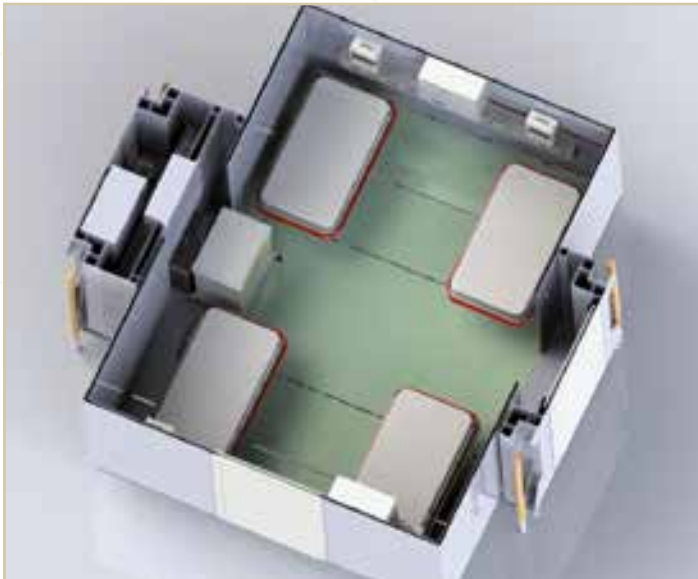
Container protection cage and modular site materials designed for the safety needs of the troops in the operation area are being developed to provide protection against mortar attacks and gun fire.

- Container Protection Cage
- Modular Position



## MOBILE HOSPITAL DESIGN AND PRODUCTION FACILITIES

The production of the mobile field hospital system serving at Role 2 level, modular, lightweight, highly maneuverable, can be used in all kinds of operations, can be increased with additions and capabilities, mobile as much as the unit it supports, rapidly responding to the type and urgency of the given task, easily carried on vehicles, capable of life and limb-saving surgery, designed in a structure that can be established and assembled in all kinds of areas in a very short time and can adapt to Technologies of today and future, was included in the planning of 2021 by the Ministry of National Defence and the Ministry predicted that additional hospital needs will be met by our factory in the following period.





## TAF CEREMONIAL SWORDS AND CADET RAPIERS PRODUCTIONS

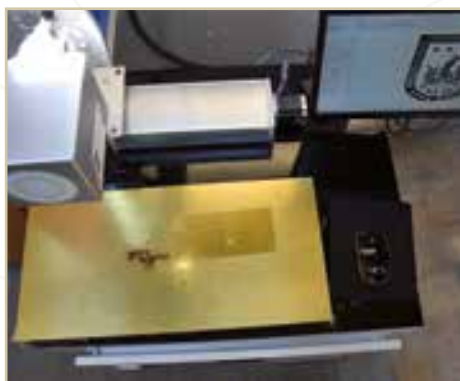
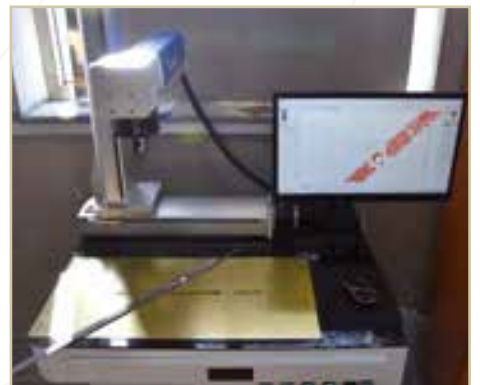
Production activities of ceremonial swords given to the staff of the General Command of the Gendarmerie and all Forces' Commands of the Turkish Armed Forces due to the ceremonies since 1991 and the production of the cadet rapiers manufactured for the use in the ceremonies of the students who have been studying at Naval and Military Academies since 2006 are performed at the 7<sup>th</sup> Main Maintenance Factory Directorate. The work load assigned varies from year to year, with an average of 3.000 to 4.500 swords and 300 to 1.200 pieces of rapier production.

- Turkish Land Forces Ceremonial Sword (Long-Short)
- Turkish Air Forces Ceremonial Sword (Long-Short)
- Turkish Naval Forces Ceremonial Sword (Long-Short)
- Gendarmerie Forces Ceremonial Sword (Long-Short)
- Turkish Land Academy Cadet Rapier
- Turkish Naval Academy Cadet Rapier



## SWORD MANUFACTURING / REPAIR AND CEREMONY RIFLE / BAYONET REPAIR ACTIVITIES

The Sword Production Workshop is also responsible for repairing swords and rapiers that have been manufactured in the previous periods and deformed over time, as well as coating and renovation of ceremonial firearms, various weapons and bayonets.



## OTHER MANUFACTURING CAPABILITIES

7<sup>th</sup> Main Maintenance Factory Directorate is responsible for meeting storage, heating, housing, kitchen, archiving, etc. needs of the units. It is capable of manufacturing various sheet materials which will be needed to be used in its existing facilities.

- Adjustable Rack Unit
- Yukon Type Tent Stove
- Food Hot Service Bank
- Tent Metal Parts
- Archieve Cabinet
- Various Spare Parts and Mold
- Mobile Carrier
- 5-Tabletop Tray
- Fixed Plant Oven



## PRODUCTION ACTIVITIES

The activities carried out in the manufacturing workshop were provided with a technological infrastructure with the machines supplied within the scope of the “Bench Modernization Project” carried out by the General Directorate of Military Factories, while increasing the product variety and increasing the quality to the highest level.



# CERTIFICATES

## AQAP-2110

NATO QUALITY ASSURANCE  
REQUIREMENTS FOR  
DESIGN, DEVELOPMENT AND  
MANUFACTURING





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**MAIN MAINTENANCE  
FACTORY DIRECTORATE**

## DEPOT LEVEL MAINTENANCE & REPAIR (DLM) ACTIVITIES

They include the services of maintenance, manufacture, modernization and test of ballistic protective products (helmet, vest, helicopter floor armor etc.) and manufacture/renovation of inflatable rubber boats under the responsibility of 8<sup>th</sup> Main Maintenance Factory Directorate.

### TECHNOLOGICAL APPLICATIONS

- Ballistic Protective Composite Helmet Manufacturing / Repair
- Ballistic Protective Vest (armor plate and vest) Manufacturing / Repair
- Mine Protective Equipment Manufacturing / Repair
- Helicopter Floor Armor Manufacturing / Repair
- Inflatable Rubber Boats Manufacturing / Repair
- Painting/Coating Activities

### PRODUCT RANGE

- Ballistic Protective Helmet
- Ballistic Protective Vest
- Helicopter Armour Plate
- Inflatable Rubber Boat



## STRUCTURAL MODERNIZATION PROGRAMS

**Ballistic Protective Composite Helmet:** New type composite helmet is manufactured by using polyethylene armour fabric for lightness, accessory (night vision, ear protection accessories etc.) carrier apparatus mounted on the polyethylene helmet. We can make production in different colours and three (3) sizes.

**Ballistic Protective Vest:** New type commando vest, A-Type and Z-Type modular vests are manufactured with the aim of increasing the mobility capabilities and possibilities of the personnel in operations. We can make production in different colours and sizes.





## MANUFACTURING CAPABILITIES

They include the services of maintenance, manufacture, modernization and test of ballistic protective products (helmet, vest, helicopter floor armor etc.) and renovation and manufacture of inflatable boats under the responsibility of 8<sup>th</sup> Main Maintenance Factory Directorate.

### TECHNOLOGICAL APPLICATIONS

- 3D modelling of parts and tool design by CAD software program
- Special manufactured molds used for manufacturing ballistic protection armour plates and helmets in Composite Helmet Workshop
- Vest manufacturing and ballistic protective material assembly in Composite Vest Workshop
- Helmet accessory carrier apparatus and various plastic materials are manufactured by plastic injection presses.
- Ballistic protection levels are tested at ballistic laboratory.
- Inflatable boats are manufactured in rubber boat workshop.
- Helmets and armor plates are painted and coated in paintworks with IRR finish coating.
- Marking on the product by laser
- Cutting the parts of ballistic products using Waterjet Cutting Machine

### MACHINING

Screws, nuts and required spare parts having various size are produced by turning and milling processes.



## MANUFACTURING CAPABILITIES

### POLYETHYLENE COMPOSITE HELMET (FULL-CUT MODEL)

New type composite helmet manufactured by using polyethylene armour fabric for lightness. In the design of the helmet, a night vision mount accessory mount, fixing clamp, and a new type interior equipment group that provides a more ergonomic structure during usage in order to mount accessories suitable for tactical operations.

#### Technical Features

Weight : 1310-1450 g  
 Armor Material : UHMW-PE / Aramid / Carbon Fabric  
 Ballistic Protection : NIJ Standard 0101.04 Level III-A

### POLYETHYLENE COMPOSITE HELMET (HIGH-CUT MODEL)

The polyethylene based Modular Ear Protection High Cut Ballistic Composite Helmet manufactured for operations in line with the needs of the TAF personnel, provides the opportunity to be used with headphones, one of the communication systems that Commando Units need during operations.

#### Technical Features

Weight : 1190-1330 g  
 Armor Material : UHMW-PE / Aramid / Carbon Fabric  
 Ballistic Protection : NIJ Standard 0101.04 Level III-A

### BALLISTIC EAR PROTECTOR

Ballistic Ear Protector Panels, which are produced to be used with High-Cut Model Ballistic Composite Helmets, provide the opportunity to be used with communication systems that are important in the execution of tactical operations.

#### Technical Features

Weight : 270 g  
 Armor Material : UHMW-PE / Carbon Fabric  
 Ballistic Protection : NIJ Standard 0101.04 Level III-A



# MANUFACTURING CAPABILITIES

## MODULAR COMMANDO VEST

Designed for operation in line with the needs of Commando Units, the Tactical Vest has more ergonomic, lighter and better abilities to fulfill the needs.

During the design phase of the vest and accessories, the opinions and suggestions of the personnel working in the Commando Units were received and the configuration was clarified in line with these opinions.

### Technical Features

- Total Weight : 10740 ± 100 g
- Hard Armor Weight : max. 7500 g
- Hard Armor Materials : Ceramic+UHMW-PE
- Vest Weight : 1320 ± 50 g
- Ballistic Protection : NIJ Standard 0101.04 Level IV



## A-TYPE MODULAR VEST

The modular ballistic composite vest, produced for operations in line with the needs of the TAF personnel, provides ergonomics by mounting the desired accessories on the vest as desired.

### Technical Features

- Soft Armor Weight : max. 3550 g
- Soft Armor Materials : Aramid
- Hard Armor Weight : max. 4500 g
- Hard Armor Materials : UHMW-PE
- Vest Weight (with soft armor) : 4200 - 5300 g
- Total Weight (M-L-XL) : 7900-8800-9800 ± 100 g
- Ballistic Protection : NIJ Standard 0101.04 Level III



## Z-TYPE MODULAR VEST

Designed for the use of armored vehicle crews, the vest's outer cover is made of flame retardant fabric. Thus, it is aimed to protect the crew inside the armored vehicle against flames in case of possible threats.

### Technical Features

- Soft Armor Weight : max. 1950 g
- Soft Armor Materials : Aramid
- Hard Armor Weight : max. 5200 g
- Hard Armor Materials : Ceramic+UHMW-PE
- Vest Weight (with soft armor and accessories) : 3750 g
- Total Weight : 9000 ± 100 g
- Ballistic Protection : NIJ Standard 0101.04 Level IV



## MANUFACTURING CAPABILITIES

### BALLISTIC INSERT PLATES

Using with the ballistic protective vests, hard armor plates provide protection of personnel against infantry rifles shots in NIJ 0101.04 Level III standard.

#### Technical Features

Hard Armor Material : UHMW-PE

Dimensions & Weights

M: 23 x 28 cm<sup>2</sup> : 1220 ± 50 g

L: 25 x 30 cm<sup>2</sup> : 1400 ± 50 g

XL: 27 x 32 cm<sup>2</sup> : 1640 ± 50 g

Side plate : 600 ± 50 g

Ballistic Protection : NIJ Standard 0101.04 Level III

### HELICOPTER FLOOR ARMOR

Helicopter Floor Armor is produced in order to protect various helicopter models against shooting by infantry rifles during air operations.

#### Technical Features

Total Weight

S-70 : 150 - 170 kg

Cougar : 205 - 232 kg

Mi-17 : 210 - 230 kg

Armor Material : UHMW-PE

Ballistic Protection : NIJ Standard 0101.04 Level III

### HELICOPTER WATER COLLECTION POOL

It is produced in order not to damage the electronic components of the helicopter from the wetness on the personnel during the launching and embedding of S.A.T. (Underwater Offence) / S.A.S. (Underwater Defence) and Amphibious Units during air operations.

The water above the personnel taken out of the water and put in the helicopter, it flows into the helicopter water collection pool and is discharged outside.

#### Technical Features

Weight : 20-23 kg

Helicopter Models : AB-412 EP  
AS-532 Cougar

Material : Neopren

### FLIGHT STAFF VEST

The configuration of the ballistic protective vest, which is produced to protect the pilot and technical personnel involved in air operations against the threats they may be exposed to, has been made considering the requirements necessary for the flight personnel to perform the operation in an ergonomic and functional way.

#### Technical Features

Total Weight : 5050 ± 80 gr.

Soft Armor Weight : 880 ± 20 gr.

Hard Armor Weight : max 2600 gr.

Soft Armor Materials : Aramid Fabric

Hard Armor Materials : Ceramic + UHMW-PE

Vest Weight : 1570 ± 20 gr.

Ballistic Protection : NIJ Standard 0101.04 Level IV



# MANUFACTURING CAPABILITIES

## MINE PROTECTION EQUIPMENT

It is designed and produced in order to protect personnel from the flame and shrapnel effects that may be created by mine/IEDs. It includes a Ballistic Composite Helmet with a ballistic protective visor, Protective Suit and Mine Boat. The Protective Suit is made of non-flammable (flame retardant) Nomex fabric. In addition, there is soft armor inside the Protective Suit to provide NIJ O101.04 Level III-A protection against shrapnel that may occur as a result of mine/IED explosion.

### Technical Features

Total Weight	: 14300 ± 200 g
Suit Weight	: 9450 g
Helmet Weight (with visor)	: 2700 g
Boot Weight	: 2150 g/piece
Suit Material	: Nomex Fabric
Armor Material	: Aramid Fabric + UHMW-PE
Ballistic Protection	: A/P Mine protection (114 grams TNT eqt.) MIL SPEC 662-F (Frag.)



## UNDER-SHIRT VEST

It is designed to protect personnel exposed to shots with pistol/submachine gun against threats during duty, provide the opportunity to be used with clothing thanks to its ergonomic structure.

### Technical Features

Total Weight	: 3500 g
Vest Weight	: 360 g
Soft Armor Weight	: 3140 g
Soft Armor Material	: Aramid fabric
Ballistic Protection	: NIJ Standard O101.04 Level III-A



## G 470 COMBAT BOAT

G 470 is a product of passing water, produced by 8<sup>th</sup> Main Maintenance Factory Directorate in line with the needs of the Commands.

### Technical Features

Crew	: 10 Person
Payload	: 1250 kg
Number of Airtight Chambers	: 5+2+1
Material	: Neopren
Floorboard	: Roll-up (Aluminium)
Weight (Empty)	: 135 kg
Length	: 470 cm
Width	: 192 cm



## TECHNOLOGY AND DEVELOPMENT ACTIVITIES

8<sup>th</sup> Main Maintenance Factory Directorate performs research and development projects required to increase economical use and efficiency of the products and carries out armoring and manufacturing activities.

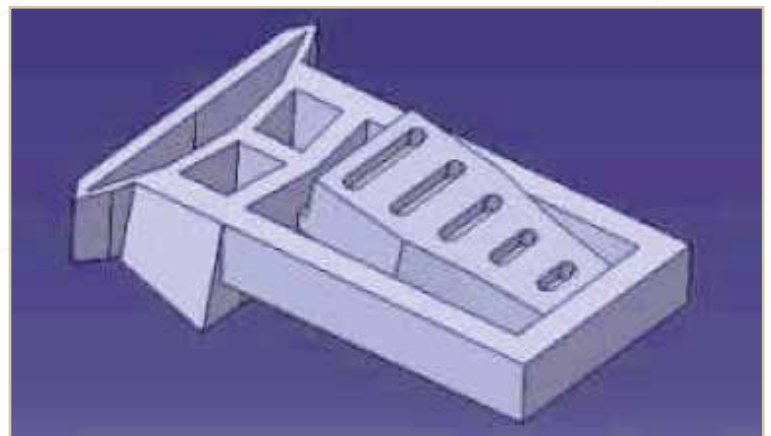
### MECHANICAL CAPABILITIES

#### Mechanical Design

Mechanical parts designs required for the integration and development projects are performed by using Computer Aided Design (CAD).

#### Recent Projects

- Level IV Armor Plate - Increasing the protection level of armor
- 4 sizes for helmet (M-L-XL-XXL)
- New helmet design
- Lightweight helmet - Lighter, more comfortable, more protective
- Light and ergonomic accessories



## TEST ACTIVITIES

Quality Control Directorate performs all kind of test and process controls of the products under the responsibility of 8<sup>th</sup> Main Maintenance Directorate. Determination of the ballistic products capabilities and ballistic test activities of other TAF/private sector institutions and organizations are also conducted.

Test that are made include: ballistic bullet tests as per NIJ 0101.04, NIJ 0101.06, NIJ 0108.01, TS EN 1063, STANAG 4569 and test of fragment as per MIL662F, TS-13349, STANAG 2920 standards are applied.

### PRODUCT RANGE

- Ballistic Protection Helmet
- Ballistic Protection Vest
- Mine Protection Equipment
- Helicopter Floor Armor
- Equipment not produced by 8<sup>th</sup> Main Maintenance Factory Directorate



## QUALITY ASSURANCE ACTIVITIES

Activities of maintenance, manufacture, modernization and test of ballistic protective products quality controls are performed by Quality Management Directorate.

### QUALITY ASSURANCE LABORATORIES

#### Physical Test Laboratory

- Tensile Test
- Climate conditioning devices
- Water immersion conditioning
- Test bullet preparing

#### Ballistic Test Laboratory

- Composite Helmet Tests:
  - Bullet Test
  - V50 Fragment Test
- Composite Vest Tests:
  - Bullet Test
  - V50 Fragment Test
- Products not produced by 8<sup>th</sup> Main Maintenance Factory Directorate (Shield, glass, vehicle armor etc.)
  - Bullet Test
  - V50 Fragment Test





## CERTIFICATES

8<sup>th</sup> Main Maintenance Factory Directorate which gives priority for personnel life security and customer satisfaction at overall activities has been awarded or applied to the certificates below:

### AQAP-2110

NATO QUALITY ASSURANCE REQUIREMENTS FOR DESIGN, DEVELOPMENT AND MANUFACTURING

### TS EN ISO/IEC 17025

GENERAL REQUIREMENTS FOR THE COMPETENCE OF TESTING AND CALIBRATION LABORATORIES (In the process of application)





# **ELECTRO-OPTICAL SYSTEMS MAIN MAINTENANCE FACTORY DIRECTORATE**

## AIR DEFENCE MISSILE SYSTEMS MAINTENANCE AND REPAIR

Depot/company level maintenance and repair of Portable Stinger Training Aids and ATILGAN/ZIPKIN weapon systems of pedestal mounted stinger in TAF inventory (Land Forces, Air Forces and Navy) are performed.

### PORTABLE STINGER TRAINING AIDS

- Repair/Maintenance of Gas Charging Unit (GCU)
- Repair/Maintenance of Gas Pumping Unit (GPU)
- Repair/Maintenance of power supply unit (PSU)
- Repair/Maintenance of Gas Charging Unit (GCU)
- Repair/Maintenance of M 160 Seeker Head training unit
- Pedestal mounted Stinger ("Zipkin"/ "Atilgan") subsystems Maintenance/ Repair/Test



## ARTILLERIES, MISSILES AND ROCKETS MAINTENANCE AND REPAIR

Depot/Company level maintenance and repair activities are carried out for 122mm SAKARYA, 302mm KASIRGA multiple launch rocket system (MLRS) and K+, 600mm YILDIRIM, 610mm BORA missiles and weapon systems in the Turkish Armed Forces inventory.

### SUBSYSTEMS UNDER OUR MAINTENANCE/REPAIR AND CALIBRATION RESPONSIBILITY

- Repair/maintenance of fire control systems
- Repair/maintenance of satellite and navigation systems
- Repair/maintenance of automatic meteorology station systems
- Repair/maintenance of automation control systems
- Update and loading of computer and software
- Repair/maintenance and test of missile/rocket fire systems
- Repair/maintenance of ground test equipment



## BARRELED AIR DEFENCE WEAPON SYSTEMS MAINTENANCE AND REPAIR

Depot/Company level maintenance and repair activities of 35mm Oerlikon Weapon Systems in Turkish Armed Forces inventory are conducted.

### REPAIR & MAINTENANCE ACTIVITIES FOR 35 MM OERLIKON

- Maintenance/Repair of weapon section
- Maintenance/Repair of loader
- Maintenance/Repair/Test of Barrel
- Maintenance/Repair of Electronic drawer
- Maintenance/Repair of starter
- Maintenance/Repair/Test of Speed regulator
- Maintenance/Repair of radar section
- Maintenance/Repair of computer section
- Maintenance/repair of tracking section



## ANTI-TANK MISSILE SYSTEMS MAINTENANCE AND REPAIR

Maintenance/repair, test, modification, structural parts repair and replacement of anti-tank systems, mechanical, electrical and electronic systems under Electro-optical Systems Main Maintenance Factory Directorate responsibility are performed.

### PRODUCT RANGE

#### TECHNOLOGICAL APPLICATIONS

- Maintenance, repair and tests of trigger systems, missile guidance sets, optical sight, night vision and training sets of MILAN, ERYX and KORNET-E Anti-tank systems
- Maintenance, repair and tests of battery charger
- Maintenance, repair, tests and modification of anti-tanks systems batteries and cables
- Maintenance, repair and tests of mechanical systems of anti-tank systems
- Test/repair and maintenance of night vision, weapon trigger system, missile guidance set, training set, optic vision set of TOW weapon systems
- Side/elevation test, 2W1 cable test, training sets test and self-test of guidance electronic system of TOW weapon system



# MECHATRONIC AND FIRE CONTROL SYSTEMS MAINTENANCE AND REPAIR

Maintenance, repair, sustainment activities for electronic cards, mechanical parts, mechatronic and fire control systems of Leopard and M-Series Tanks, armoured combat vehicles towers, tactical wheeled armoured vehicle towers under the responsibility of Electrooptic Systems Main Maintenance Factory Directorate are performed during their life cycles.

## MECHATRONIC AND FIRE CONTROL SYSTEMS

- Leopard 2A4, Leopard 1T, Leopard 1A3T1, M60A3, M60T, M48A5T2 Main Combat Tanks fire control systems and tower hydraulic/pneumatic systems repairs and test
- Armoured combat vehicles (ZMA DAF, ZMA DRAGAR), tactical wheel armoured vehicles (KOBRA) and Stabilized Advanced Remote Weapon Platform (SARP) fire control systems and tower pneumatic/hydraulic systems repairs and test
- Repair and test of:
  - Leopard (Leopard 2A4, Leopard 1T, Leopard1A3T1) and M-Series (M60A3, M60T, M48A5T2) tanks
  - Armoured combat vehicles (ZMA DAF, ZMA DRAGAR)
  - Tactical Wheeled Armoured Vehicles (COBRA),
  - Stabilized Advanced Remote Weapon Platform (SARP)
  - Fire control systems electronic cards, pneumatic/hydraulic systems and gyroscope



## LASER INTEGRATED SYSTEMS MAINTENANCE AND REPAIR

Maintenance, Repair and Sustainment activities for on-vehicle/on-platform laser systems are performed by the Electro-optical Systems Main Maintenance Factory Directorate during their life cycles.

### LASER INTEGRATED SYSTEMS

- Repair and test of target coordinate positioning systems
- Repair of laser distance measurement systems
- Repair of goniometer
- Repair of laser distance determination systems
- Repair of Laser target pointing system
- Repair and tests of optical sections and electronic cards





## VISION SYSTEMS MAINTENANCE AND REPAIR

Depot/company level maintenance, repair, modernization and modification activities for surveillance systems, night vision goggles and their equipment are performed.

### NOT ON-VEHICLE/ON-PLATFORM VISION SYSTEMS SHOP

- TV/MON3L Monocular Night Vision Goggles
- TV/MAM 14.93 Binocular Night Vision
- DORUK Handheld Thermal Binoculars
- A600 Night Vision Attachment
- TSD35 Mini Thermal Weapon Sight
- TSD-E60 Mini Thermal Vision Sight
- 6X Sniper Night Vision Weapon Sight
- TV/NVS 4X Night Vision Weapon Sight
- DRAGONEYE Electro-Optic Sensor System
- PARS660 Thermal Weapon Sight
- TYPE-1 Thermal Light Weapon Sight
- M983 Night Vision Goggles
- M972 Night Vision Goggles
- AN/PVS-7B Night Vision Goggles
- M929 Pilot Night Vision Goggles
- AN/AVS-6 Pilot Night Vision Goggles
- PUHU A-500 Pilot Night Vision Goggles
- M930 Pilot Night Vision Goggles
- Artillery Night Vision Binoculars M995
- Light arm Night Vision Binoculars M993
- M9865 Artillery Night Vision Binoculars
- M9866 Light arm Night Vision Binoculars
- M9885 Long distance Surveillance Binoculars
- M978 Night Vision Hand Binoculars
- M1505 Night Vision Hand Binoculars

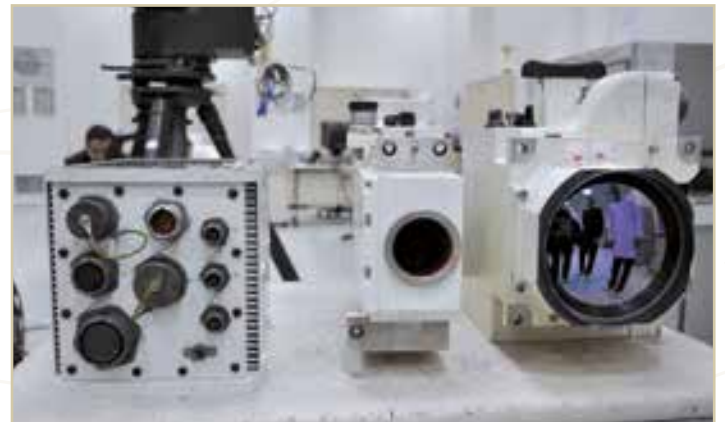


## VISION SYSTEMS MAINTENANCE AND REPAIR

Depot/company level maintenance, repair, modernization and modification activities for surveillance systems, night vision goggles and their equipment are performed.

### ON-VEHICLE/ON-PLATFORM VISION SYSTEMS SHOP

- New Generation Stationary Thermal Camera (Kerkenez)
- Thermal Monitoring Unit Coral
- Thermal Monitoring Unit Gözcü
- Baykuş Thermal Camera
- Hawk Eye E/O Reconnaissance and Surveillance System
- Thermal Camera System ASIR-SH2K
- Hawk eye OD E/O System
- M48A5T2 Tank Vision System
- M60A3 Tank Vision System
- M60T 120mm Tank Vision System
- LEOPARD2A4 Tank Vision System
- LEOPARD1T Tank Vision System
- Armoured Combat Vehicle Vision System
- Strengthened APC Vision System
- TTZA COBRA Vision System
- SAPR Tower Vision Systems (ATS 70, ATS 71)



# CALIBRATION ACTIVITIES

Internationally-traceable calibration activities for the precise measurement instruments in the responsibility field of EOS MMFD are performed in compliance with the determined standards.

## ELECTRONIC CALIBRATION

- AC/DC Voltage Calibration (AC 1100V /DC 0-10 KV)
- AC/DC Current Calibration (AC 11A /DC 11A)
- Resistance Calibration (0Ω-330 MΩ)
- Inductance Calibration (10μH-1H)
- Capacitance Calibration (1000pF-1,111μF)
- Phase/Angle Calibration (1Hz-200kHz)
- Digital/Analog Multimeter Calibration
- Calibrator Calibration
- High Voltage Calibration (0-50 GHz)
- Attenuator Calibration
- Low/High Level RF/Microwave Power Calibration (Low: 0-50GHz High:0-250MHz)
- Time/Frequency Calibration (DC-50GHz)
- Spectrum Analyser Calibration (DC-50GHz)
- Analog/Numerical Oscilloscope Calibration (DC 10Hz-6GHz)



## MECHANIC CALIBRATION

- Pressure ( (-1) - (1200) Bar)
- Dimensional ( (0-800) mm)
- Torque ( (0-1200) Nm)
- Angle ( (0-360) Degree)
- Temperature ( (-40) °C - (1000) °C)
- Optic



## CERTIFICATES

### AQAP-2110

NATO QUALITY ASSURANCE  
REQUIREMENTS FOR  
DESIGN, DEVELOPMENT  
AND MANUFACTURING





# AIR MAINTENANCE FACTORIES







1

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**AIR MAINTENANCE  
FACTORY DIRECTORATE**

## AIRCRAFT DEPOT LEVEL MAINTENANCE, REPAIR AND OVERHAUL (MRO&U) ACTIVITIES

The activities include maintenance, repair, test and modification of hydraulic, pneumatic, mechanic, electrical and avionic systems along with repair and replacement of structural parts of aircraft belong to 1<sup>st</sup> Air Maintenance Factory Directorate.

### TECHNOLOGICAL APPLICATIONS

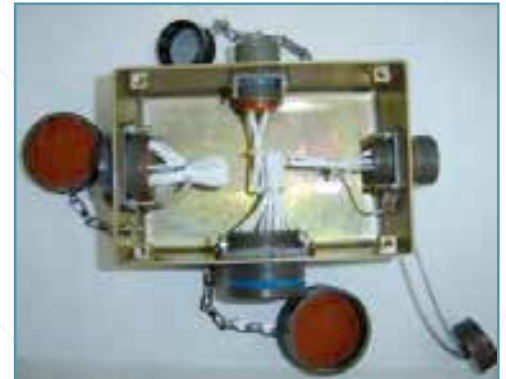
- Depot Level Maintenance (F-4E, NF-5, T-38M)
- FS 341 Bulkhead Repair and Replacement (F-16)
- FS 479 Bulkhead Replacement (F-16)
- FS 161, 189 and 218 Longeron Repair, Replacement and Enforcement (F-16)
- Analytical Condition Inspections (F-16, T-38)
- Weapon and Avionic System Integration
- Avionic Integration Projects Application
- Avionic Modernization (F-4, F-5, F-16, T-38)
- Structural Upgrade/Enforcement (F-4, F-5, T-38M)
- Paint Removal (Chemical, Bead-Blasting)
- Painting Process



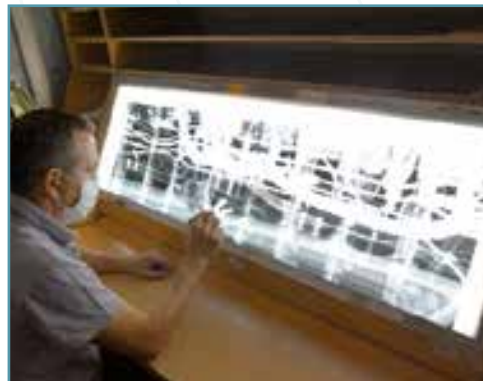


# AIRCRAFT DEPOT LEVEL MAINTENANCE, REPAIR AND OVERHAUL (MRO&U) ACTIVITIES

- Matrix, Panel, Cable and Harness Assy. Repair, Production and Test



- Non-Destructive Control
  - X-Ray, Real Time X-Ray,
  - FPI, MPI, ECI, Ultrasonic Control



- Composite Repair and Production (F-16, F-4E, NF-5, T-38M, KT-1T)



- Weapon System Units Maintenance and Overhaul



## AIRCRAFT DEPOT LEVEL MAINTENANCE, REPAIR AND OVERHAUL (MRO&U) ACTIVITIES

- External Fuel Tank Maintenance



- Canopy Aft Arch Production and Replacement (F-16)
- Canopy / Windshield Maintenance (F-16, F-4E, NF-5, T-38M, KT-1T)



- Ejection Seat Depot Level Maintenance (F-16, F-4E, NF-5, T-38M, KT-1T)



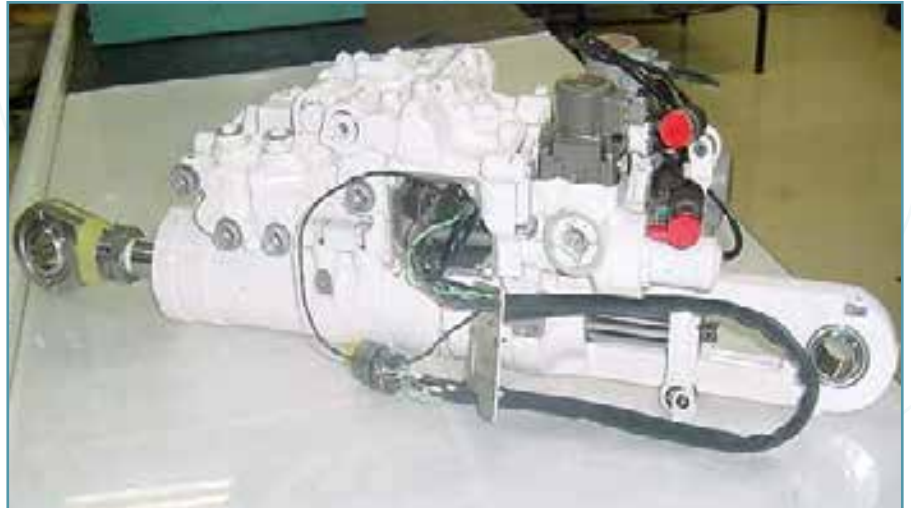
## ACCESSORY DEPOT LEVEL MAINTENANCE

It includes the services of maintenance, overhaul, repair, upgrade and functional test of the accessories related to the aircraft and ground support systems with their power plants under the responsibility of 1<sup>st</sup> Air Maintenance Factory Directorate.

### PRODUCT RANGE

#### HYDRAULIC AND LANDING GEAR SYSTEM ELEMENTS

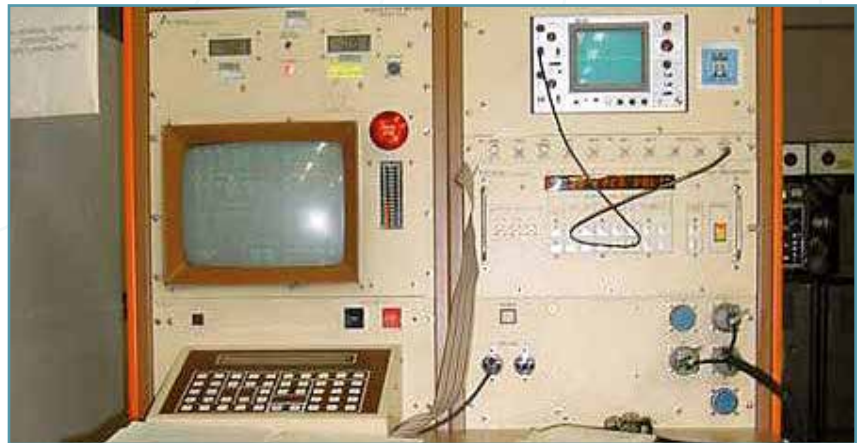
- Pumps and Motors
- Servo and Solenoid Valves
- Cylinders
- Servo Actuators
- Hydraulic Reservoirs
- Filters
- Dampers
- Accumulators
- Brake Elements
- Rims
- Struts / Cylinders



## ACCESSORY DEPOT LEVEL MAINTENANCE

### ELECTRICITY POWER SYSTEM ELEMENTS

- AC/DC Generators
- Control Panels
- Illumination Elements
- Regulators
- Linear and Rotary Actuators
- Pilot Control Elements (Throttle Quadrant /Grip)
- Starters



## ACCESSORY DEPOT LEVEL MAINTENANCE

### PNEUMATIC SYSTEM ELEMENTS

- Cooling Turbines / Air Conditioning
- Cabin Pressurizing Units and Safety Valves
- Heat Exchangers / Separators
- Anti-Icing Valves
- Oxygene Regulators/Convertors



## ACCESSORY DEPOT LEVEL MAINTENANCE

### ENGINE SYSTEM ELEMENTS (OIL, FUEL, MECHANIC)

- Fuel Control Units
- Main Engine Control Unit
- Pumps
- Valves
- Actuators
- Fuel Nozzle / Spraying Units
- Fuel/Oil Coolers
- Gear Boxes / Constant Speed Drives



FIRST AIG  
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CRIME - ESTABLISHMENT  
TERRY

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14 February 2001

## ACCESSORY DEPOT LEVEL MAINTENANCE

### TECHNOLOGICAL APPLICATIONS

- Ball Bearing Inspection / Repair
- Honing Machine
- Bead Blast
- Non-Destructive Inspections
- Computer Controlled Profile Measurement
- Surface Smoothness / Profile Test

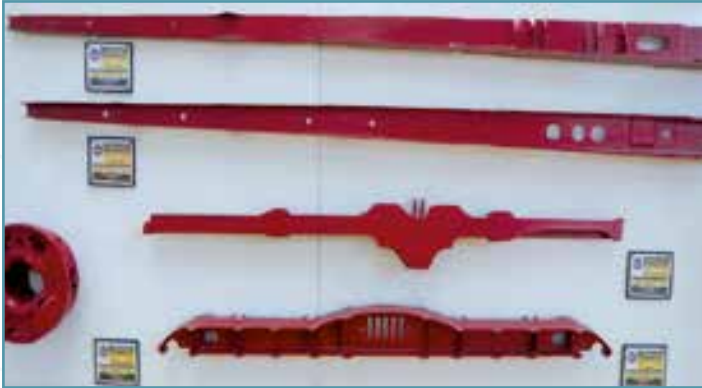


## MANUFACTURING CAPABILITIES

1<sup>st</sup> Air Maintenance Factory Directorate renders manufacturing services for aircraft, helicopter, air and ground support systems and their structural parts, spare parts, special tools under its responsibility.

### TECHNOLOGICAL APPLICATIONS

- 3D Modelling and design with NX CAD software program
- CNC machining programming with NX CAM software program
- Shaping of aluminum and steel sheets by rubber diagram and tension application
- Manufacturing honeycomb, sheet and structural parts of cure parts such as rudder and wing by autoclave method





## MANUFACTURING CAPABILITIES

- Tube manufacturing/bending/test processes and manufacturing of aluminium fuel and hidrolic tubes by CNC machines
- Manufacturing and test process of aircraft/engine hose assemblies
- Mold and part manufacturing with CNC wire cutting/EDM
- Aircraft control cable coating and test processes
- Vacuum plastic forming processes
- Laser cutting operations

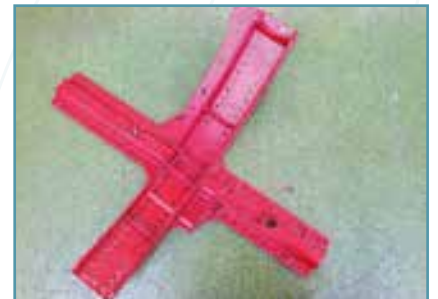


## MANUFACTURING CAPABILITIES

### MAIN MACHINING PRODUCTION METHODS

Manufacturing of aircraft structural and engine parts such as attach fitting, pylon rib, bulkhead, pin by;

- 5 Axis Machining
- C-Y Axis Turning/Milling
- Grinding
- Manufacturing various aircraft and fixture with TIG-MIG and spot welding by using aluminium and steel.



# MANUFACTURING CAPABILITIES

## MAIN HEAT TREATMENT PROCESSES

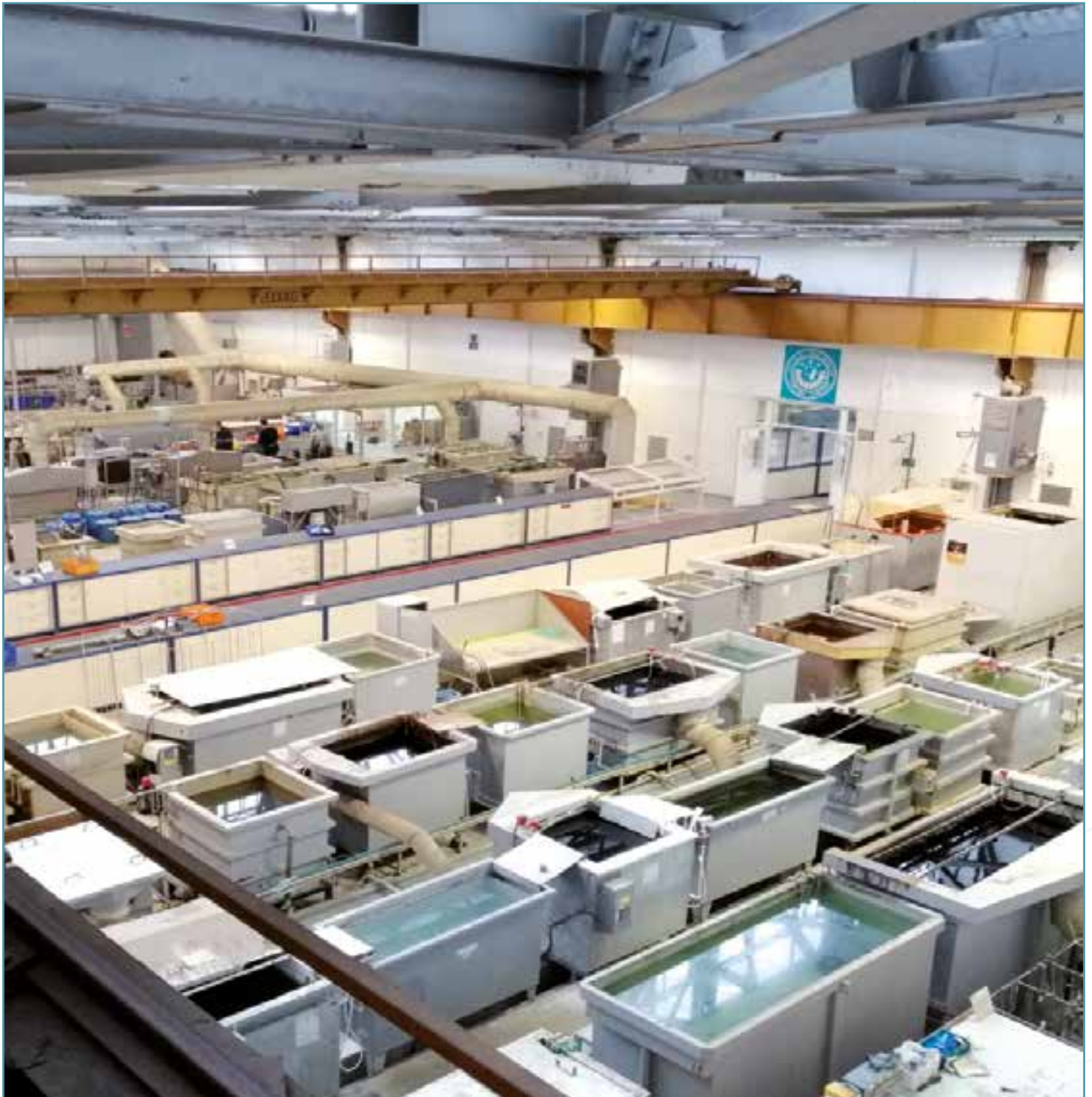
- Normalization
- Stress Relief
- Hardening
- Tempering
- Aging
- Sementation
- Solution Making
- Annealing



## MANUFACTURING CAPABILITIES

### MAIN COATING PROCESSES

- Black Oxide
- Hard Chrome
- Phosphate
- Copper
- Cadmium
- Silver
- Borazon
- Currentless, Nickel
- Cromic Acid Anodized
- Sulphuric Acid Anodized
- Chemical Abrasion



# MANUFACTURING CAPABILITIES

## OTHER MAIN PROCESSES

- Repairing and testing of aircraft fuel tanks
- Laser scanning technology in the field of reverse engineering
- Measuring by CMM
- Forging steel and aluminium parts in 500 and 1000 tons presses
- Polyurethane and cellulosic painting



## AVIONICS DEPOT LEVEL MAINTENANCE

It includes the services of maintenance, repair, overhaul, functional test services and new capability acquisition efforts for F16, KT-1T, F4E-2020, F5-2000, T-38 (TurAF equipment) avionic systems and their avionic parts and cards of aircraft in the inventory of 1<sup>st</sup> Air Maintenance Factory Directorate.

### FIRE CONTROL SYSTEMS

It carries out the maintenance, repair and overhaul activities for the radar units and ECM Pod units of F-4E/2020 aircraft which are modernized.

### CAPABILITIES

- Radar Processor
- Transmitter
- Magnetic Compass
- ECM POD Systems
- Mode Selector
- Compass Adapter Compensator
- Nav Inlet
- Flight Director Computer
- Air Weapon Release Unit
- Electronic Compensator Adapter
- Light Vertical
- Gun Control
- Adapter Power Supply
- Radar Antenna
- Trim Control Unit



# AVIONICS DEPOT LEVEL MAINTENANCE

## FLIGHT CONTROL AND INDICATOR SYSTEMS

Maintenance, repair and overhaul of the flight control and indicator systems of the aircraft (F-16, F-4E/2020, NF-5 ve T-38) in its inventory are carried out.

### CAPABILITIES

#### Flight Control

- T-38 SAS ECA
- F-5 SAS ECA
- F-4 HUD
- T-38 HUD
- F-16 AOA Transmitter
- F-4 AOA Transmitter
- F-5 AOA Transmitter
- CN235 AOA Transmitter
- C160 AOA Transmitter
- F-4 CADC
- CN-235 EFD
- T-38 UFCP
- F-5 MADC
- F-4 UFCP

#### Indicator Systems

- Altimeters
- Attitude Director Indicators
- Variometers
- Horizontal Situation Indicator
- Vertical Velocity Indicator
- Bearing Indicator
- RPM Indicator
- Tachometer Indicator
- Fuel Quantity Indicator
- Fuel Flow Indicator
- Oxygen Quantity Indicator
- Transmitter



## AVIONICS DEPOT LEVEL MAINTENANCE

### AIRCRAFT COMMUNICATION & NAVIGATION SYSTEMS

It renders maintenance, repair, overhaul, functional test services and new capability acquisition efforts for F16, KT-1T, F4E-2020, F5-2000, T-38 (TurAF vehicles) communication systems and their avionics parts and cards in the inventory of 1<sup>st</sup> AMFD.

### CAPABILITIES

- KT-1T MC (Mission Computer)
- F16 MATRIX Units
- KT-1T MFD (Multi Function Display)
- KT-1T – BFI (Bearing Flight Inst.)
- KT-1T, F-16, T-38 Avionic Panels
- KT-1T Battery-2
- T-38 EFI (Engine Flight Inst.)
- Joystick and Throttle levers
- F4E-2020, F5-2000 and T-38 Avionic Cards





# AVIONICS DEPOT LEVEL MAINTENANCE

## EGI SYSTEMS & PCB REPAIR



### CAPABILITIES

- F4-2020 / F-16 Radar/Avionic Units
- F4-2020 / VTR
- F4-2020 / Cougar LN100GT INS/GPS
- T-38 Electronic Cards
- KT-1T / AWACS / UAV /SEA HAWK & BLACK HAWK INS/GPS
- KT-1T / AVSR
- F-16 / DVR (MDR-80) and DVR-RMM
- T38 / DDR
- F-16 / F-4 / F-5 MATRIX, Power Panel, LRU, Relay Board



# AVIONICS DEPOT LEVEL MAINTENANCE

## ENGINE AVIONIC SYSTEMS

It renders maintenance and overhaul services for aircraft engine avionic units.

### CAPABILITIES

- DEC (Digital Electronic Control)
- Ignition Exciter / LEAD
- M-EMSC (Modernized- Engine Monitoring System Control)
- Spark Igniter
- Temperature/Speed/Flame Sensors
- Pyrometer
- Oil Pressure Transmitter
- Wiring Harness
- Temperature Amplifier
- Stator/Rotor
- Tachometer Generator
- LVDT
- Thermocouple
- T5 Engine



# AVIONICS DEPOT LEVEL MAINTENANCE

## TECHNOLOGICAL APPLICATIONS

Software, hardware and manufacturing of the following systems were made by 1<sup>st</sup> AMFD.

- Automatic Test Station (OTC)
- Engine Warning Test Set (EWTS)
- Underwater Locator Beacon (ULB Test Set)
- Upgraded of GENRAD

■ AUTOMATIC TEST STATION (OTC)



EWTS ■



ULB TEST SET ■



■ Upgrade of GENRAD



## PRECISION MEASUREMENT EQUIPMENT CALIBRATION

1<sup>st</sup> Air Maintenance Factory Directorate Calibration Laboratory provides its customers the calibration services they need to ensure safe, accurate, reliable and traceable measurements.

The quality of the calibrations performed is secured through adherence to the quality principles, procedures and practices detailed in USA Air Force Metrology and Calibration (AFMETCAL) Program. Compliance to the requirements is guaranteed through biennial assessments performed on-site by AFMETCAL auditors. An unbroken traceability chain to national and/or international metrology system is offered through the use of reference standards calibrated by Turkish National Metrology Institute (UME) or USA Air Force Primary Standards Laboratory (AFPSL) which is on its behalf traceable to USA National Institute of Standards and Technology (NIST).

**Calibration Laboratory works in three main skill areas. Which are:**

- Physical/Mechanical calibration
- Electrical/Electronic calibration
- On-Site calibration

### PHYSICAL CALIBRATION

High precision dimensional calibrations are performed in an environment of  $20^{\circ}\text{C} \pm 0.56^{\circ}\text{C}$  ( $68^{\circ}\text{F} \pm 1.0^{\circ}\text{F}$ ) and  $35\% \text{RH} \pm 15\% \text{RH}$



CALIBRATION FIELD	MEASUREMENT CAPABILITY	ACCURACY
DIMENSION	0,010 - 4 in	$\pm 12 \mu\text{in}$
	5 - 20 in	$\pm 3 \mu\text{in}$
	0 - 30 in	$\pm 50 \mu\text{in}$
INSIDE DIAMETER	0 - 14 in	$\pm 50 \mu\text{in}$
OUTSIDE DIAMETER	0 - 20 in	$\pm 30 \mu\text{in}$
PARALLELISM	-	$\pm 50 \mu\text{in}$
ROUNDNESS	Diameter: 7 in	Axial/Radial: $\pm 5 \mu\text{in}$
	Tilt: 6 in	Coning: $3 \mu\text{in/in}$
FLATNESS	1-6 in (OPTICAL FLAT)	$\pm 4 \mu\text{in}$
TEMPERATURE	$-20^{\circ}\text{C} - 0^{\circ}\text{C}$	$0,005^{\circ}\text{C}$
	$0^{\circ}\text{C} - 450^{\circ}\text{C}$	$0,004^{\circ}\text{C}$
	$450^{\circ}\text{C} - 600^{\circ}\text{C}$	$0,013^{\circ}\text{C}$
ANGLE	$0 - 360^{\circ}$	$\pm 0,25 \text{ arc sec}$
SCALE	1mg - 50kg	ASTM E617 Class2
	1/32oz - 50lb	ASTM E617 Class1
MASS	1mg - 1100gr (Comparator)	$\leq 0,15 \text{ mg}$
	0 - 10kg (Comparator)	$\leq 4 \text{ mg}$
	10 - 64kg (Comparator)	$\leq 7 \text{ mg}$
	1mg - 50kg	ASTM E617 Class2
	1/32oz - 50lb	ASTM E617 Class1
OPTICS (Transit, Theodolite, etc.)	4ft - 50ft	$\pm 0,001 \text{ in}$
	50ft - $\infty$	$\pm 2 \text{ sec}$

# PRECISION MEASUREMENT EQUIPMENT CALIBRATION

## MECHANICAL CALIBRATION

Pressure/Vacuum, Force/Torque and Flow measurements are performed under the environmental conditions of 22.8°C ± 3.3°C and 35 %RH ± 15%RH.



CALIBRATION FIELD	MEASUREMENT CAPABILITY	ACCURACY
AIR FLOW	0,01 to 0,1 SLPM	±0,75% of rdg
	0,1 to 1 SLPM	
	1 - 10 SLPM	
	10 - 100 SLPM	
	100 - 1000 SLPM	
PRESSURE	1 - 380kpa Automatic Air Data Calibration	±0,0039% of reading + 0,06Pa
	0 - 1000psi Primary Pressure (Gauge and Absolute)	±0,004% of reading + 0,19Pa
	100 - 15000psi High Pressure	±0,01% of reading
	(to - 10000psi Pneumatic)	
	(to - 15000psi Hydraulic)	
VACUUM	1x10 <sup>-2</sup> Torr - Atmospheric	±0,05 Torr
TORQUE	0,5in oz - 2000lbft (cw/ccw)	%±0,25 of reading
	2000lb.ft - 14000lb.ft (cw/ccw)	±0,5% reading
FORCE	50lb - 2000lb	±%0,1 of reading
	2000lb - 20000lb	±%0,1 of reading
	5000lb - 50000lb	±%0,1 of reading
	10000lb - 50000lb	±%0,1 of reading

# PRECISION MEASUREMENT EQUIPMENT CALIBRATION

## ELECTRICAL/ELECTRONIC CALIBRATION

Electrical/Electronics Calibration Division is located in an environment kept at  $22.8^{\circ}\text{C} \pm 3.3^{\circ}\text{C}$  and  $35\% \text{RH} \pm 15\% \text{RH}$ .

CALIBRATION FIELD	MEASUREMENT CAPABILITY	ACCURACY
AC/DC Voltage Calibration	AC 0,1mV - 1000V	$\pm 0,005\%$
	DC 0 - 1000V	$\pm 0,001\% + 20\mu\text{V}$
AC/DC Current Calibration	AC 1mA - 20A	$\pm 0,1\%$
	DC 10mA - 100A	$\pm 0,0025\%$
Resistance Calibration	$1\Omega - 100\text{k}\Omega$	$\pm 35\text{ppm}$
Inductance Calibration	100mH	$\pm 0,1\%$
Capacitance Calibration	0,0001 to 0,5 $\mu\text{F}$	$\pm (0,1\% + 0,5\text{pF})$
Digital/Analog Multimeter Calibration	Included all voltage, current, resistance, inductance, capacitance values	
Calibrator Calibration		
Aircraft Test Set Calibration		



# PRECISION MEASUREMENT EQUIPMENT CALIBRATION

## ELECTRICAL/ELECTRONIC CALIBRATION

CALIBRATION FIELD	MEASUREMENT CAPABILITY	ACCURACY
Low/High Level RF/Microwave Power Calibration	10MHz to 18GHz Power 20dBm to 90dBm	
Time/Frequency Calibration	1Hz - 10MHz	$2 \times 10^{-12}$
	10MHz - 10GHz	$5 \times 10^{-12}$
Spectrum Analyzer Calibration	3Hz to 26,5 GHz	
Analog/Digital Oscilloscope Calibration		
Vibration Transducer Calibration	1Hz to 10kHz	$\pm\%1,1$
Phase/Angle Calibration	0 to 999,999°	$\pm 0,010^\circ$ at 1Hz to 200kHz
High Voltage Calibration	1kV to 15kV DC	$\pm 0,05\%$
Attenuator Calibration	10MHz to 18GHz/0 to 110 Db	0,6dB + 0,09dB/GHz



## PRECISION MEASUREMENT EQUIPMENT CALIBRATION

### ON-SITE CALIBRATION

On-Site Calibration Division serves the needs of customers whose equipment needs to be serviced on-site.

Jet Engine Test Stands deployed all around the country deciding the airworthiness of jet engines and several types of Test Benches located in workshops accepting or rejecting units depending on the measurement results obtained by the equipment calibrated constitute the major workload of this group.

Jet Engine Test Stand and the other Test Bench calibrations are made in accordance with their respective procedures under locally monitored environmental conditions.





## PRECISION MEASUREMENT EQUIPMENT CALIBRATION

Major Capabilities of On-Site Calibration Division are as follows:

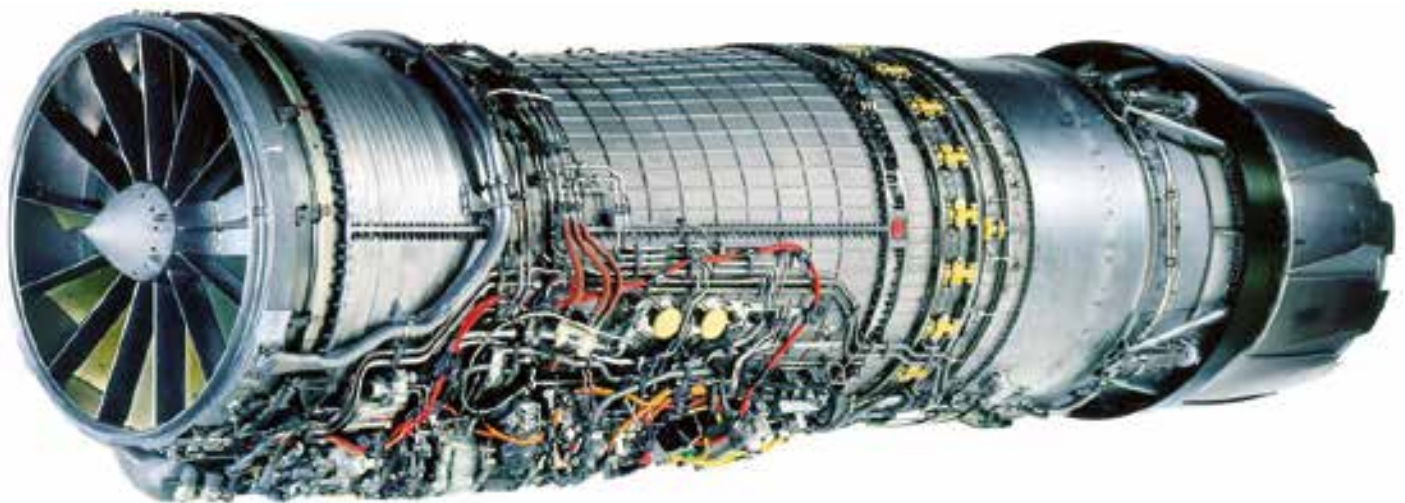
- Turboprop/Turbofan/Turbojet Engine Test Cell Calibration of J79, J85, F110, CT7/T700
- T56/TYNE22, PGB, GTC and ADG type engines
- Functional Check/Test Benches Calibration
- Hydraulic Analysis Device Calibration
- Oil Analysis Device Calibration



## JET ENGINE OVERHAUL

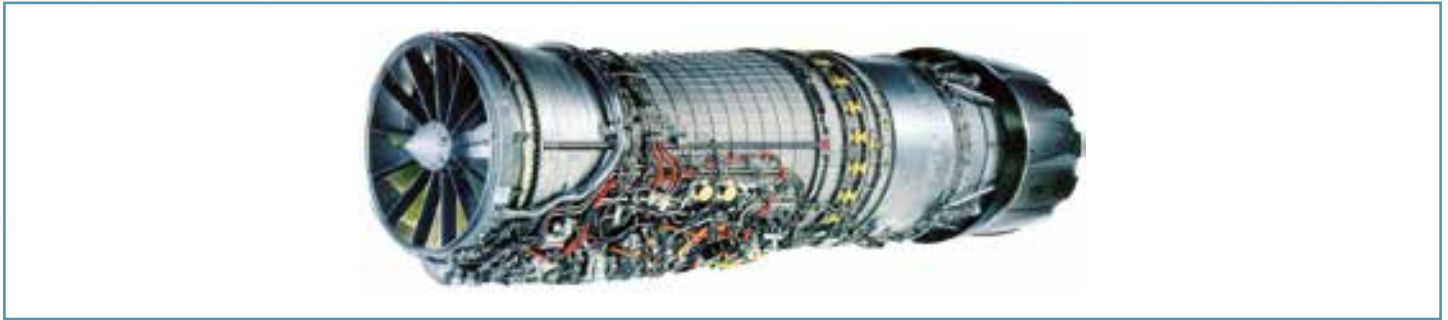
### Jet Engine (Propulsion) Department conducts;

- Depot level maintenance and test
- Repair
- Modification
- Replacement
- Inspection and
- Upgrade of;
  - Turbofan (F110-GE-100 /129, TF33-PW-100A)
  - Turbojet (J79-GE-17C, J85-GE-5H, J85-CAN-15N)
  - Turboprop (TYNE-MK-22, T56-A-15LFE, CT7-9C)
  - Turboshaft (T700-401/701)
  - Gas Turbine Compressor (GTC85-70A/71/160A/180)
  - Jet Fuel Starter (JFS)
  - And replacement of repairable parts of those engines



# JET ENGINE OVERHAUL

## TURBOFAN



ENGINE MODEL	AIRCRAFT TYPE
F110-GE-100/B/C	F-16C/D Blok 30-40
F110-GE-129/-129B	F-16C/D Blok 50/50+
TF33 PW-100A	AWACS

## TURBOJET



ENGINE MODEL	AIRCRAFT TYPE
J79-GE-17	F-4E/2020
J85-CAN-15	NF-5A/B
J85-GE-5H	T-38A/M

## TURBOPROP



ENGINE MODEL	AIRCRAFT TYPE
T56-A-15	C-130
TYNE-MK-22	C-160
CT7-9C	CN-235

# JET ENGINE OVERHAUL

## TURBOSHAFT



ENGINE MODEL	AIRCRAFT TYPE
T700-GE-701C	Sikorsky

## AIRCRAFT STARTER



ENGINE MODEL	AIRCRAFT TYPE
GTCP85-180	A/M32A
GTC85-70	MA1A
GTC-71	C-130
GTC-160A	C-160
JFS	F-16C/D

## PROPELLER GEAR BOX



ENGINE MODEL	AIRCRAFT TYPE
T56-A-15	Reduction Gear Box (RGB)
CT7-9C	Propeller Gear Box (PGB)

# JET ENGINE OVERHAUL

## ENGINE OVERHAUL CAPABILITIES

- Engine Disassembly and Assembly
- Engine Part Inspection
- Video Borescope



## JET ENGINE OVERHAUL

### ENGINE OVERHAUL CAPABILITES

- Static and Dynamic Balancing
- Engine Testing



# JET ENGINE OVERHAUL

## ENGINE REPAIR CAPABILITIES

- Chemical Cleaning and Stripping
- Mechanical Cleaning
- Grit Blasting
- Fluoride Ion Cleaning

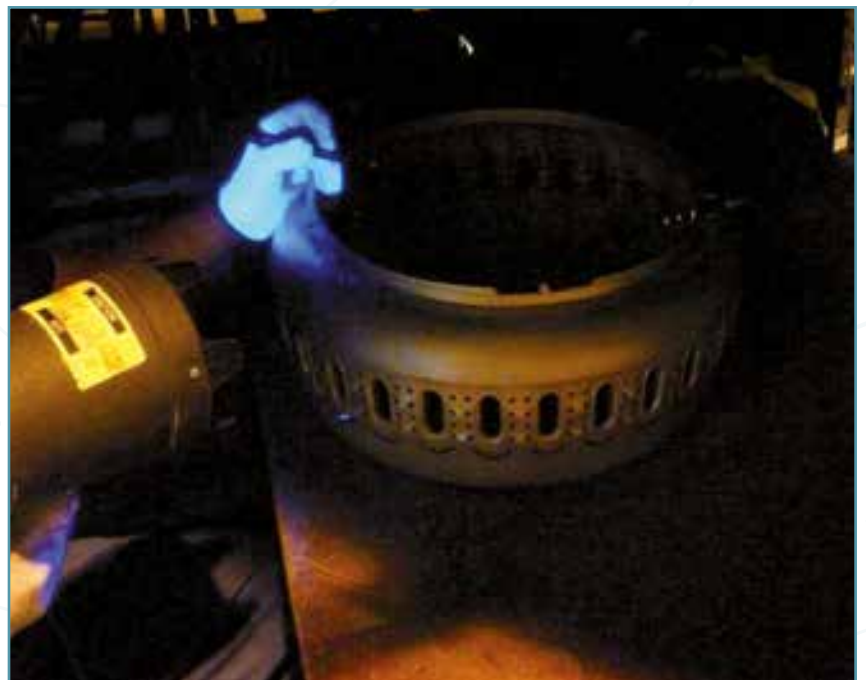


# JET ENGINE OVERHAUL

## ENGINE REPAIR CAPABILITES

### Non Destructive Inspections

- Fluorescent Penetrant Inspection-FPI
- Ultrasonic Inspection-UI
- Magnetic Particle Inspection-MPI
- Eddy Current Inspection-ECI





# JET ENGINE OVERHAUL

## ENGINE REPAIR CAPABILITIES

### Welding

- Electron Beam Welding-EBW
- Tungsten Inert Gas Welding-TIG
- Induction Braze
- Furnace Braze & Activated Diffusion Healing –ADH

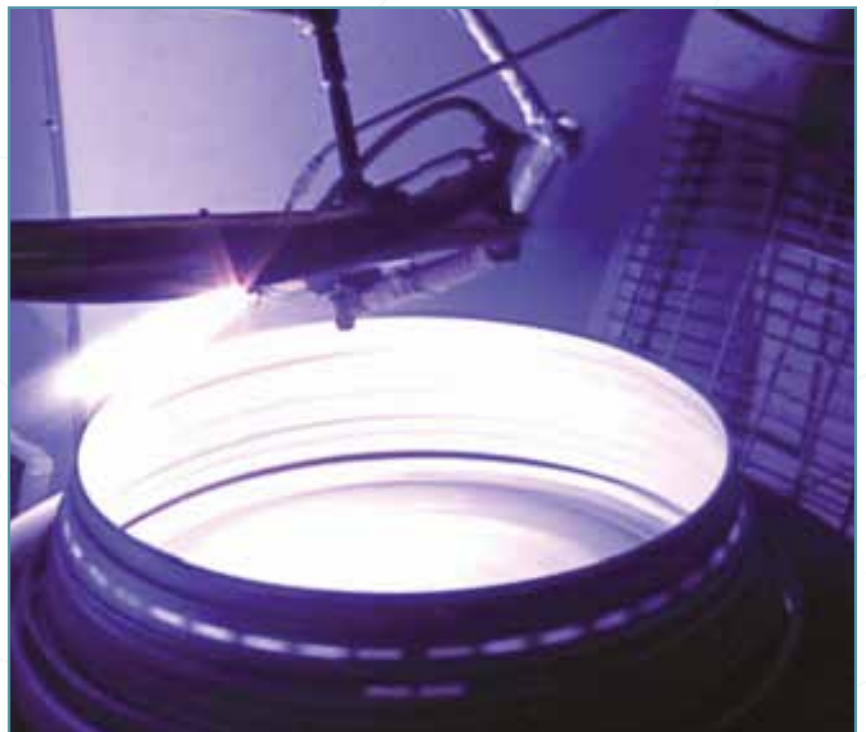


# JET ENGINE OVERHAUL

## ENGINE REPAIR CAPABILITES

### Coating-Heat Treatment

- Atmosphere Controlled Heat Treatment
- CODEP Coating
- Plasma Spray
- Flame Spray



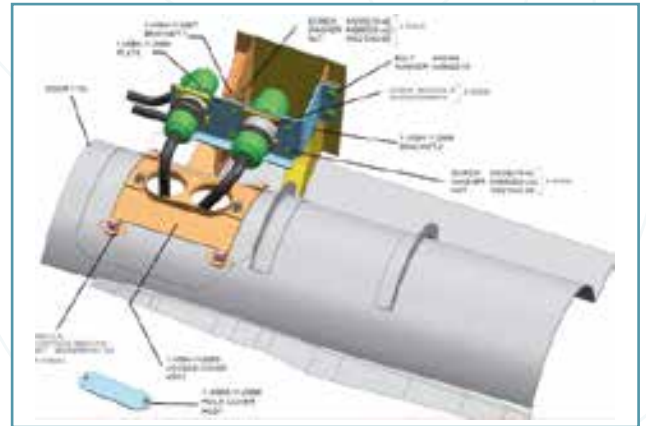
# TECHNOLOGY AND WEAPON SYSTEM DEVELOPMENT

Technology and Weapon Systems Development Directorate is responsible for integration and development projects that improve flight safety, economical usage and operational performance of aircraft under the responsibility of 1<sup>st</sup> Air Maintenance Factory Directorate.

## MECHANICAL CAPABILITIES

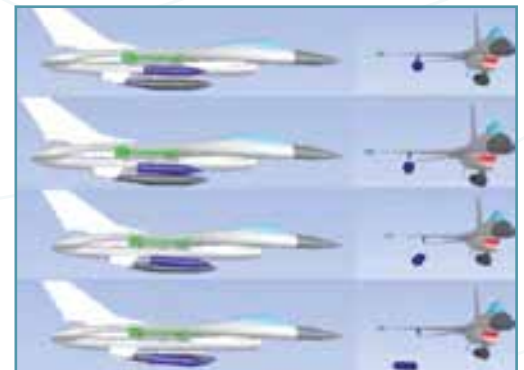
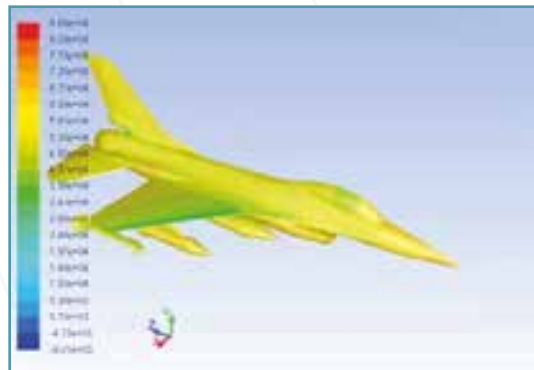
### Mechanical Design

Mechanical parts are designed for integration and development projects. Computer Aided Design (CAD) tools are used for design work.



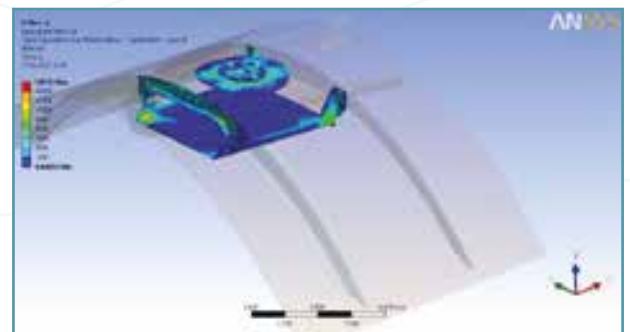
### Structural Analysis

Structural analyses are performed for validation of strength properties in new designs and existing structures. ANSYS and MSC Software products which are finite elements method softwares are used for the structural analyses.



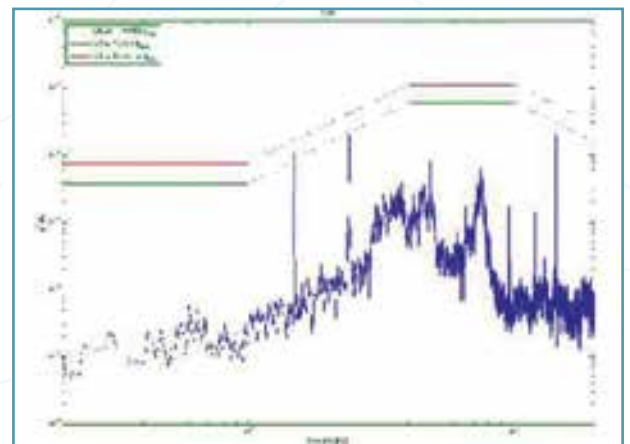
### Aerodynamic Analysis

Computational Fluid Dynamics – (CFD) analysis are performed for flight performance for aircraft and loads, drag coefficients and safe separation characteristics. ANSYS Fluent software package is used for the analyses.



### Integration and Certification Activities

Certification analyses and tests are carried out for integration of avionic systems and external stores (munition and pods). External stores certification and environmental conditions qualification activities are based on MIL-HDBK-1763 and MIL-STD-810 standards respectively.



## TECHNOLOGY AND WEAPON SYSTEM DEVELOPMENT

### AVIONICS INTEGRATION CAPABILITIES

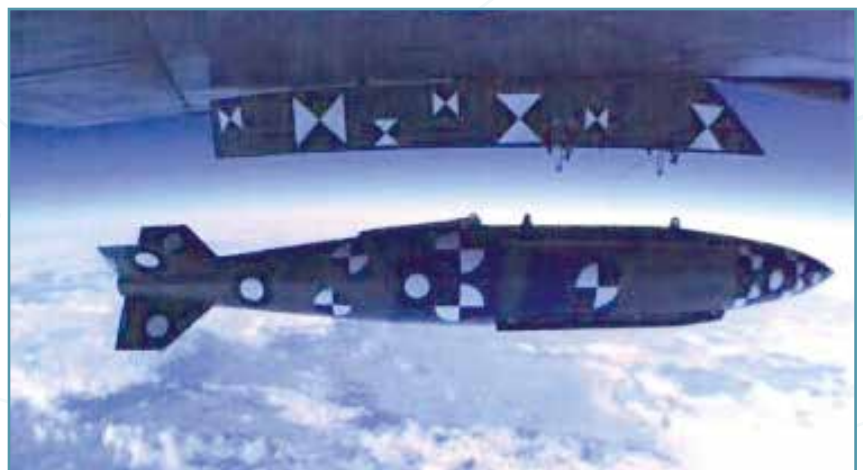
Activities performed for avionics Integration of modern avionics and Weapon Systems on aircraft in TurAF inventory:

- Electrical Group-A Design and Installation on Aircraft (MIL-W-5088)
- Pilot-Aircraft Interface Design
- Operational Flight Program Development (AQAP-2210 and IEEE 12207)
- System Integration Laboratory Tests
- Electrical Load Analysis (MIL-STD-704)
- Aircraft Ground Testing (MIL-HDBK-1763)
- Electro-magnetic Interference/ Compatibility Tests (MIL-STD-464)
- Preparation of Technical Data Package for Serial Production

### Flight Test Instrumentation

#### Capabilities :

- On-board High Speed Camera Application for Safe Separation of Munitions
- 1553 Bus Data Recording
- On-board Sensor application to collect data (vibration, temperature, pressure etc.)
- Analysis of Collected Data



## TECHNOLOGY AND WEAPON SYSTEM DEVELOPMENT

### FLIGHT TEST CAPABILITIES

Development and integration projects flight tests are performed by 401<sup>st</sup> Test Flight Fleet of 1<sup>st</sup> Main Jet Base in coordination with 1<sup>st</sup> Air Maintenance Factory Directorate.

- Planning and execution of flight tests of the modernization activities, avionic system integration and upgrade and structural upgrade projects of jet aircraft
- Planning and execution of the flight tests related to determine the cause of an anomaly
- Real time data/image transmission, data processing and evaluation in test flights
- Mobile Telemetry System capability
- Ability to follow and to direct the flights

In the scope of external store certification, planning and execution of the flight tests:

- Flight Loads Test
- Flutter Test
- Environmental Tests
- Flying Qualities Test
- Performance and Drag Tests
- Captive Flight Profile Tests
- Employment Tests
- Jettison Test
- Ballistics Tests according to MIL-HDBK-1763



## TEST AND PRODUCTION SYSTEMS DEVELOPMENT ACTIVITIES

All kinds of test, production and process control systems design, manufacture, software development and modernization activities of weapon systems and their auxiliary systems are carried out by the Test and Production Systems Development Division included by 1<sup>st</sup> Air Maintenance Factory Directorate.

Atılım Test Cell which is the first and the only national Turbojet-Turbofan engine test cell system is also designed and produced by this division.

### CAPABILITIES AND PRODUCTS

- Turbojet / Turbofan Engine Test Cell
- Turboprop / Turboshaft Engine Test Cell
- Tank Engine Test Cell
- Piston Engine Test Cell
- APU Engine Test Cell
- Engine Accessories Test Systems
- Aircraft Hydraulic Test Systems
- Aircraft Fuel-Oil Test Systems
- Aircraft Pneumatic Test Systems
- Aircraft Electric Test Systems
- F-16 ISA (Integrated Servo Actuator) Test Systems
- F-16 OBOGS (On Board Oxygen Generating System) Test Stand
- CRU-120/A Test Stand
- F-16 REOS (Regulated Emergency Oxygen System) Test Stand
- CT7 PGB (Propeller Gear Box) Test System Modernization
- Universal Pump Test Stand
- J-85 VEN (Variable Exhaust Nozzle) Test Stand
- Heat Treatment Workshop/Furnace Control System Design
- Tension-Compression Stand Design and Manufacture
- PLC (Programmable Logic Controller) Based Process Control System Design
- DAQ (Data Acquisition) System Design up to 3000 Channels
- Mobile Test System Designs
- Engine Throttle Control System Designs
- Fuel System Designs
- Lubrication System Designs
- Sound-Proof Control Rooms Design and Manufacture
- CFT Analysis



## TEST AND PRODUCTION SYSTEMS DEVELOPMENT ACTIVITIES

### ATILIM TURBOJET-TURBOFAN ENGINE TESTCELL

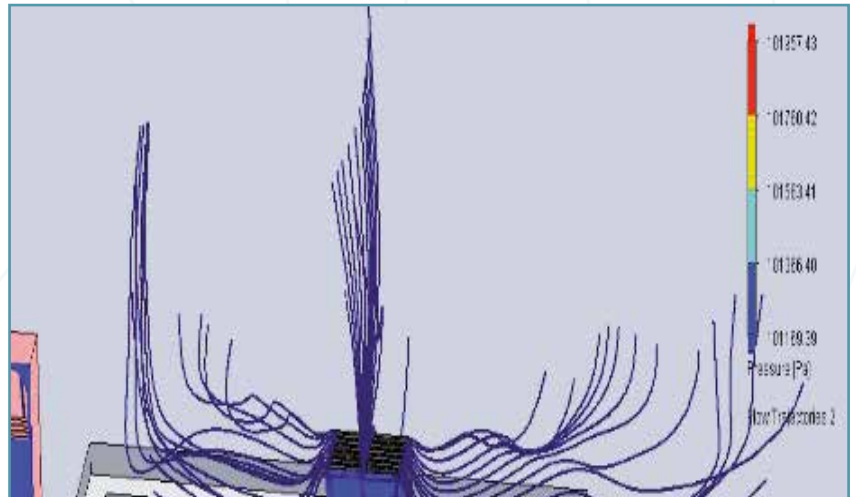
- Test system provides that several turbofan engines and turbojet engines are tested.
- It can be used as mobile system for testing different environment or fixed system in a test building.
- PLC Based control system
- Ethernet LAN is provided for all systems
- Touch-Screen control for all functions
- Digital servo throttle control
- Redundant power back-up for all systems
- Continuous scan of all the voltages and the critical currents
- Redundant control for critical systems
- Information acquisition systems provided by the NI hardware and software
- MIL-STD-1553B digital communication with engines (ARINC 429, ARINC 629 optional)
- Easily accessible hardwares provided from the leader companies
- User-friendly DAQ and Test Screen
- Automatic and Continuous control of the test parameters and their limits
- Automatic and continuous control and record with cameras throughout the test
- Real-time recording of the test parameters and camera views and replaying
- Automatic and continuous calculation of the performance data
- High speed data scanning
- Automatic calibration program
- Automatic handling of all vibration analysis
- Full PID loop control
- Specific vibration program for all type jet engines
- Graphical showing of all test parameters in the user selected form
- Reporting of all test results in the user selected form



## TEST AND PRODUCTION SYSTEMS DEVELOPMENT ACTIVITIES

### ATILIM TURBOSHAFT-TURBOPROP ENGINE TESTCELL

- Test system provides that several turboshaft engines and turboprop engines are tested.
- It can be used as mobile system for testing different environment or fixed system in a test building.
- Possibility to test different engines with dynamometer solutions of different Powers
- High loading precision even in relatively powerful engines with proportional pneumatic valves and PID control
- Closed-loop dynamometer cooling water system
- High reliability with Redundant Control System
- Upgradable Data Acquisition System
- Test cell design supported by CFD analysis suitable for air requirement

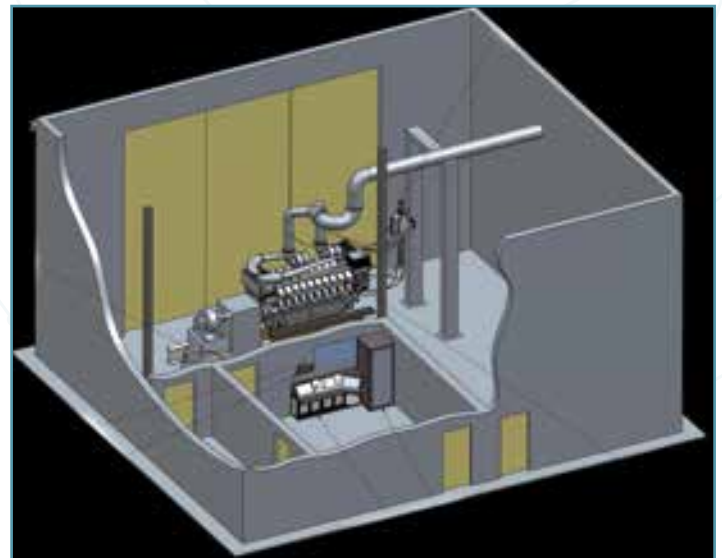




# TEST AND PRODUCTION SYSTEMS DEVELOPMENT ACTIVITIES

## ATILIM PISTON ENGINE TESTCELL

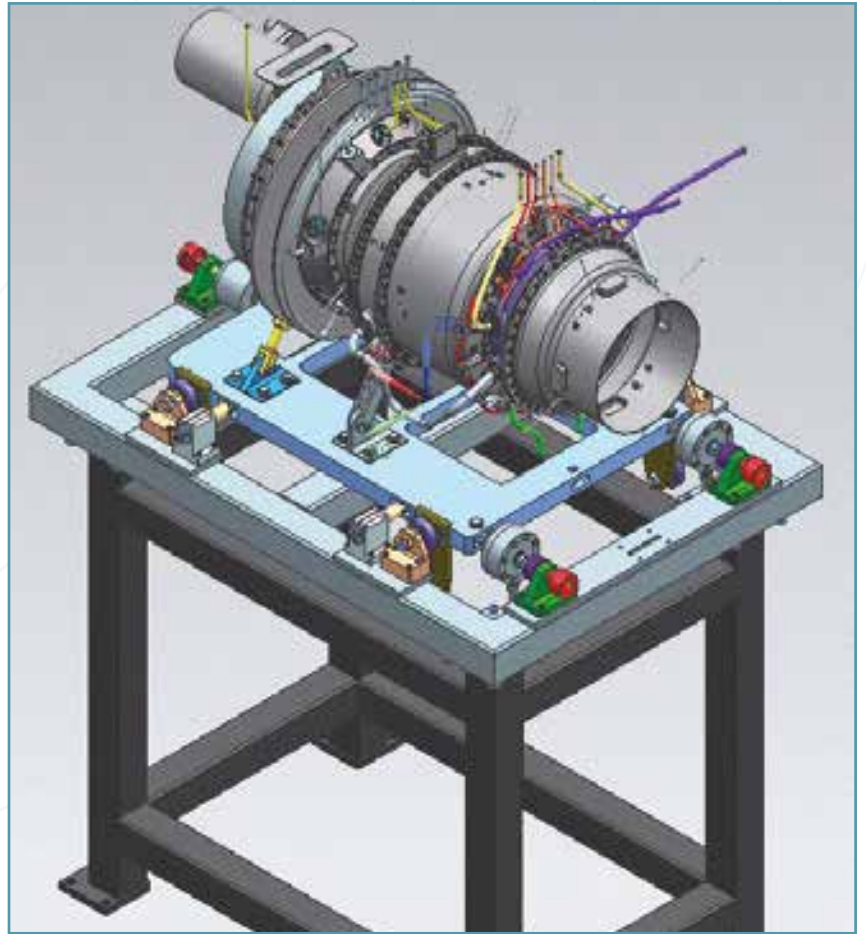
- Test system provides that several piston engines are tested.
- It can be used as mobile system for testing different environment or fixed system in a test building.
- PLC Based control
- Ethernet LAN is provided for all systems.
- Touch-Screen control for all functions
- Digital servo throttle control
- Redundant power back-up for all systems
- Continuous scan of all the voltages and the critical currents
- Redundant control for critical systems
- Information acquisition systems provided by the NI hardware and software
- Easily accessible hardwares provided from the leader companies
- User-friendly DAQ and Test Screen
- Automatic and Continuous control of the test parameters and their limits
- Automatic and continuous control and record with cameras throughout the test
- Real-time recording of the test parameters and camera views and replaying
- Automatic and continuous calculation of the performance data
- High speed data scanning
- Automatic calibration program
- Automatic handling of all vibration analysis
- Full PID loop control
- Vibration program specific for engine types
- Graphical showing of all test parameters in the user selected form
- Reporting of all test results in the user selected form



## TEST AND PRODUCTION SYSTEMS DEVELOPMENT ACTIVITIES

### ATILIM ENGINE TEST STAND

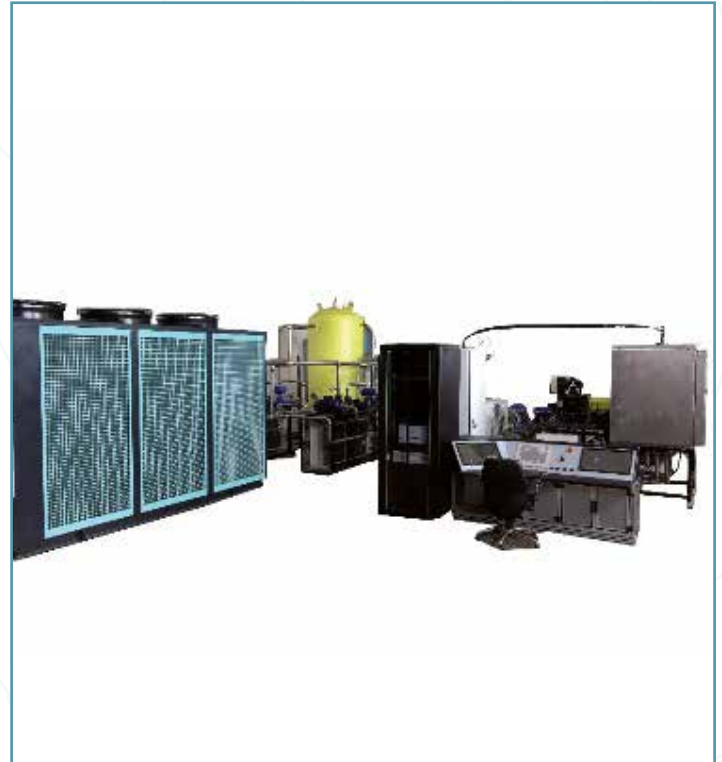
- Atilim can provide all kind of test stands for all kind of engines.
- Atilim piston engine test stand is compatible for all kind of piston engines.
- Atilim offers a variety of different Dyno Testing Tables and Testing Stands suitable for your specific testing needs from Horizontal Test Stands, Vertical Test Stands, Tilt Tables, T-Slot Tables to various XYZ Tables with computer aided solid model design.



## TEST AND PRODUCTION SYSTEMS DEVELOPMENT ACTIVITIES

### ATILIM UNIVERSAL PUMP TEST STAND

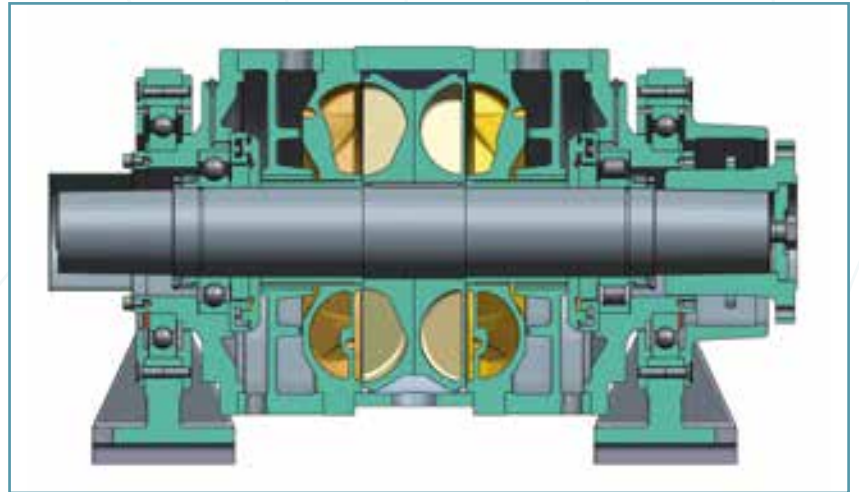
- Atilim Universal Pump Test System can test all kind of lubrication and water circulation pumps in one system.
- Fluid conditioning with powerful heating and cooling systems
- UUT conditioning with insulated test chamber
- User defined limit and alarm definition
- User defined automatic test feature
- Defining unlimited number of user-defined formulas and determining the limits independently
- Characteristic curve determination test, NPSH test, Endurance test and Cold Start test capability
- Variable and user-defined acceleration and deceleration feature



## TEST AND PRODUCTION SYSTEMS DEVELOPMENT ACTIVITIES

### ATILIM DYNAMOMETERS

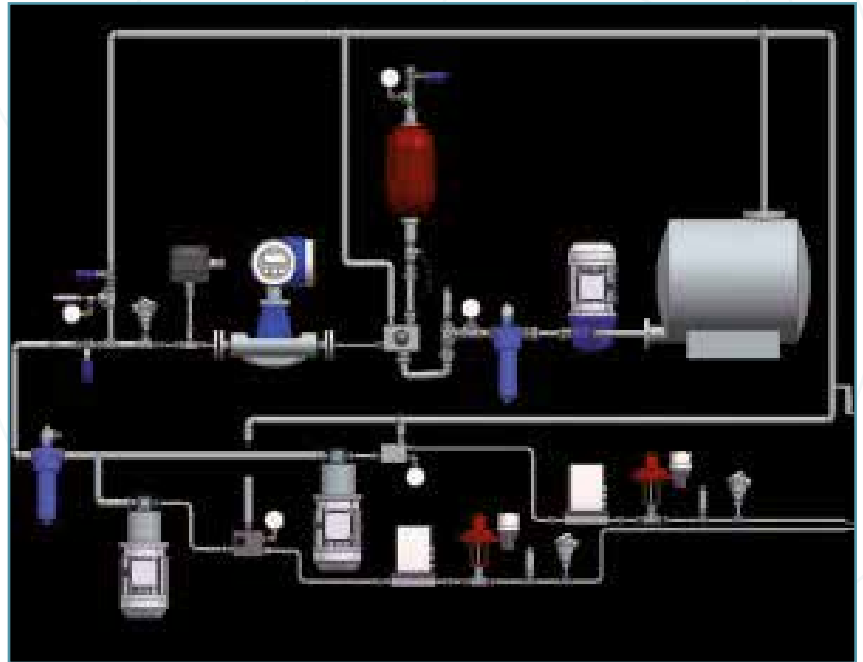
- Atilim can produce dynamometers that can be adjustable from zero to 1500 Hp load range for piston engines.
- It can be produced in the desired load range.
- Tests every rotating portion of the drivetrain
- Confirms the power and torque provided by the engine
- Simulates a real world application of the equipment
- Dynamic load control with precise flow control
- High precision crankshaft power measurement with simulated road conditions
- Low maintenance cost and long maintenance time



# TEST AND PRODUCTION SYSTEMS DEVELOPMENT ACTIVITIES

## ATILIM ENGINE LUBRICATION/FUEL SYSTEM

- Atılım can conduct design and manufacturing activities of engine lubrication/fuel systems for desired all engine types.
- Precise lubrication/fuel flow and pressure control with PID
- Selection of filtration suitable for engine and oil/fuel properties
- User-set lubrication/fuel parameters on the application
- Determination of pump type and pipe diameter according to fluid velocity, pressure and viscosity
- Deaerating system for laminar flow
- Continuity in flow with the use of accumulators



## TEST AND PRODUCTION SYSTEMS DEVELOPMENT ACTIVITIES

### ATILIM F-16 CRU-120/A TESTER

- Performs the functional test of CRU-120/A unit belonging to F-16 +50 A/C Oxygen System according to altitude
- PLC based, touch-screen control for all functions



### ATILIM F-16 ISA BUILT-IN TESTER

- It carries out the tests of ISA (Integrated Servo Actuator) belonging to F-16 on ground which can normally be performed while installed on the A/C.
- PLC based, touch-screen control for all functions



### ATILIM F-16 REOS AND OBOGS HANDHELD TESTER



# TEST AND PRODUCTION SYSTEMS DEVELOPMENT ACTIVITIES

## ATILIM J85 VEN POWER UNIT TEST STAND

- Performs test to VEN (Variable Exhaust Nozzle) of J85 engine according to its limits as half automatic
- PLC based, touch-screen control for all functions



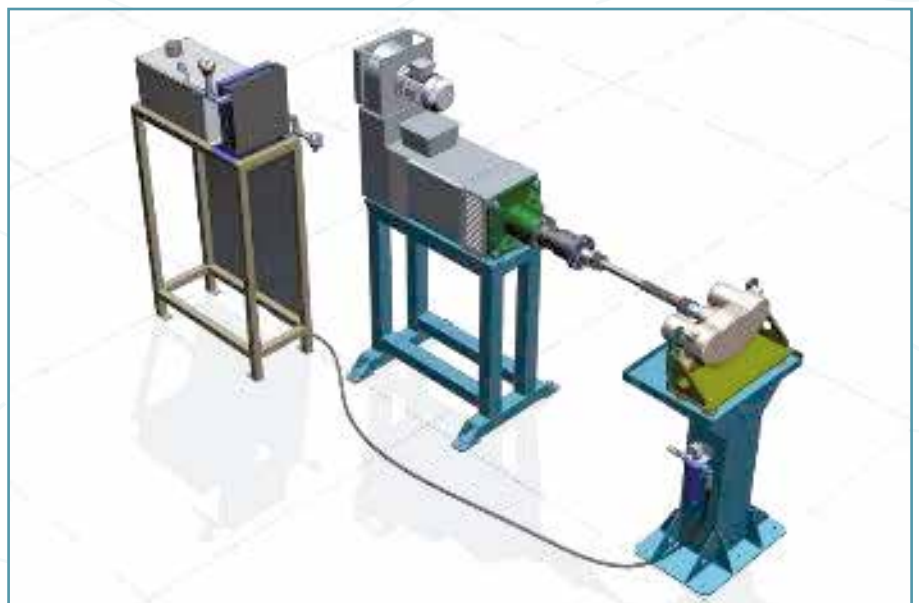
## ATILIM TENSILE MACHINE

- Performs tension and compression tests for sample materials
- Reports mechanical characteristics of samples automatically
- PLC based, touch-screen control for all functions



## ATILIM T-38 GEARBOX TEST STAND

- T-38, F-5 and NF-5 Aircraft main gearboxes can be tested
- Real-time simulation with dynamic speed control.
- PLC based, touch-screen control for all functions



## TEST AND PRODUCTION SYSTEMS DEVELOPMENT ACTIVITIES

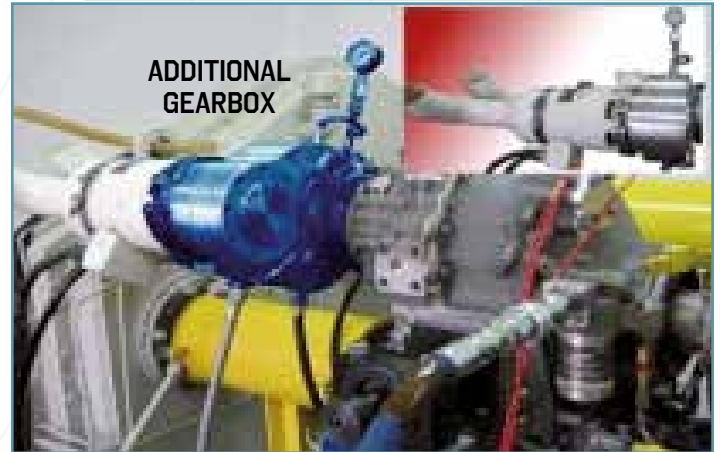
### ACCESSORY TESTING SYSTEMS MODIFICATION/MODERNISATION

Atılım offers cost effective solutions with innovative design and modification suggestions for outdated and obsolete workbenches.

■ F-110 JFS TEST STAND



CT-7 PGB TEST STAND ■



F110 HYDRAULIC PUMP TEST STAND ■





## PRODUCTION SUPPORT DIRECTORATE

The Production support Directorate renders services with the principle of ensuring the serviceability of thousand of machines with maintenance, repair, troubleshooting, engineering activities in 1<sup>st</sup> Air Maintenance Factory Directorate.

### ACTIVITIES PERFORMED

- Maintenance and repair responsibility of X-Ray Devices Used in the structural crack controls of aircraft in the inventory of the Air Force is fulfilled.
- Repair capability for Aerial Photographic Evaluation Equipment used within the scope of national security



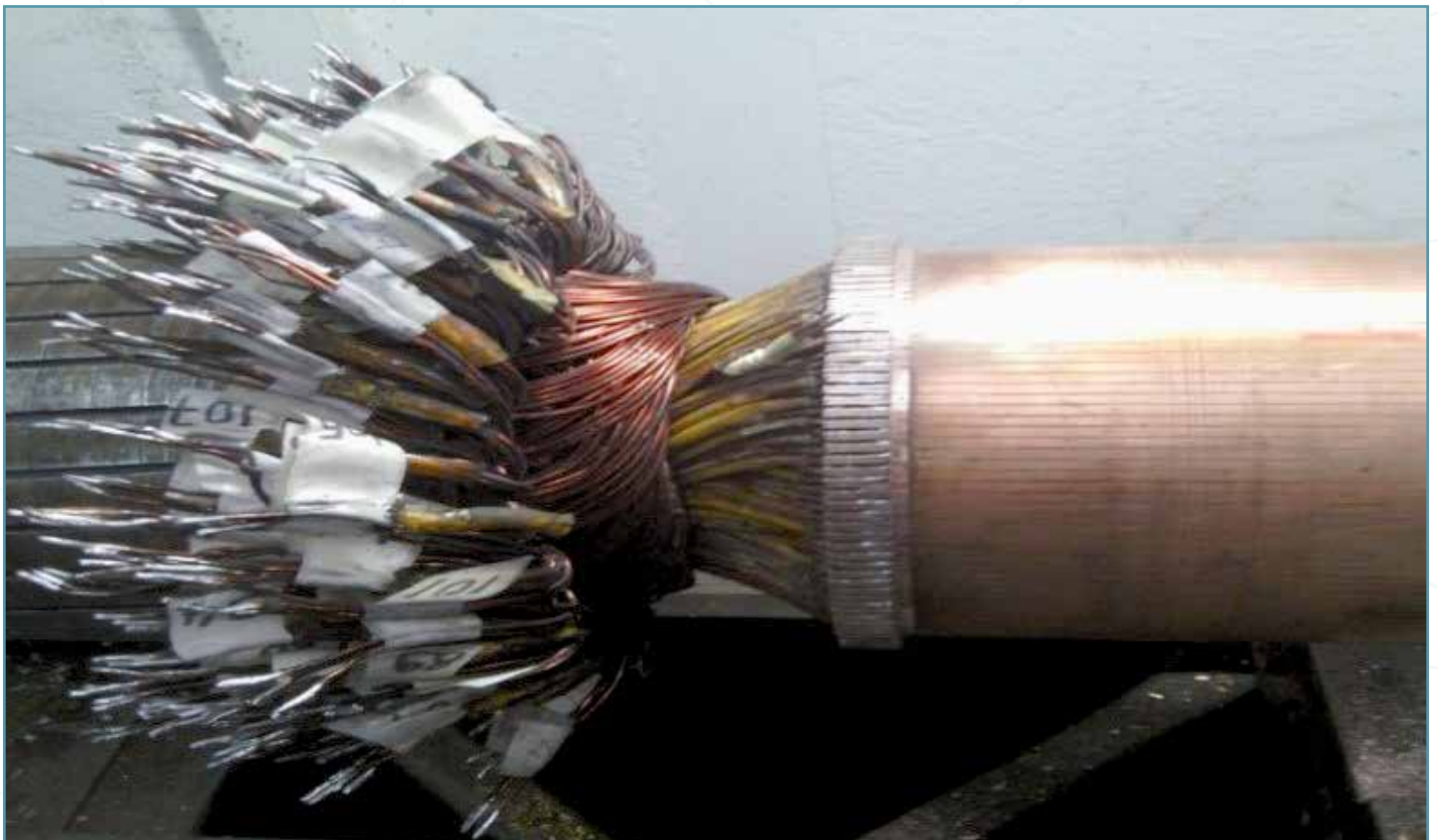
## PRODUCTION SUPPORT DIRECTORATE

- In addition to periodic maintenance, repair and troubleshooting activities of machines and equipment, engineering support is provided for modernization of machines.



## PRODUCTION SUPPORT DIRECTORATE

- Motor winding and maintenance capabilities to Electric motors of machines and equipment



## PRODUCTION SUPPORT DIRECTORATE

### PRODUCTION ACTIVITIES

In the wood workshop, wood works with various sizes are made for the Air Force needs and unit's internal needs.

- Tree Thickness Machines
- Wood Vertical Milling Cutter
- Bendsaw
- Plotter Flat Circle Machine



# PRODUCTION SUPPORT DIRECTORATE

## WOODWORK PRODUCTION ACTIVITIES

- Frame (Various Sizes)
- Panel
- Packing Crate
- Wooden Container
- Wooden Partition
- Equipment Cabinet



## PRODUCTION SUPPORT DIRECTORATE

### SHEET METAL PRODUCTION ACTIVITIES

- Repair of Aircraft Hangar Door
- Depot Door
- Aircraft Maintenance Tables and Ladders
- Table
- Metal Cabin
- Paddle Box
- Boiler
- Platform



## QUALITY MANAGEMENT ACTIVITIES

### CHEMISTRY LABORATORY

#### Aircraft Fluids Test and Analysis

- Spectrometric Oil Analysis
- Jet Fuel Test and Analysis
- Hydraulic Particles Analysis
- Aviator Breathing Oxygen and Nitrogen Analysis
- Fuel Dilution in Aircraft Oil Measurement by Fuel Sniffer

#### Metal Analysis

- Elemental analysis of metal alloys by ICP-OES, Spark-OES, Carbon-Sulfur Instruments

#### Shelf Life Material Quality Control

- FT-IR Spectrometer

#### Process Control Test and Analysis

- Chemical Coating and Cleaning Baths, aircraft paint, penetrant

#### Acceptance Tests and Analysis

- Distillation, Copper-Strip, Brookfield viscosity

### Metallurgical Laboratory

- Failure Analysis
- Process Control Tests
- Certification Tests
- Reverse Engineering
- Metallurgical Investigation
- Scanning Electron Microscope (SEM) Inspections
- Elemental analysis of surfaces or cross section of B5 to U92 materials
- FOD (Foreign Object Damage) Investigation
- Image Analysis
- Image analysis is made to detect the fractured section surface by using various magnifications. The cause of the damage is found by examining the traces of damage mechanisms in the structure.



# QUALITY MANAGEMENT ACTIVITIES

System Documents of 1<sup>st</sup> Air Maintenance Factory Directorate which keeps flight safety and customer satisfaction in the first place in all activities;

- **AQAP 2310** NATO QUALITY ASSURANCE REQUIREMENTS FOR AVIATION, SPACE AND DEFENCE SUPPLIERS
- **AQAP 2110** NATO QUALITY ASSURANCE REQUIREMENTS FOR DESIGN, DEVELOPMENT AND MANUFACTURING
- **AQAP 2210** NATO SUPPLEMENTARY SOFTWARE QUALITY ASSURANCE REQUIREMENTS TO AQAP-2110 OR AQAP-2310
- **AFMETCAL** UNITED STATES AIR FORCE METROLOGY AND CALIBRATION PROGRAM CERTIFICATE OF COMPLIANCE
- **AS 9100(C)** QUALITY MANAGEMENT SYSTEM FOR AVIATION, SPACE AND DEFENCE ORGANIZATIONS
- **AS 9110 (D)** QUALITY MANAGEMENT SYSTEM FOR AVIATION MAINTENANCE ORGANIZATIONS
- **ISO 9001** QUALITY MANAGEMENT SYSTEM
- **ISO 14001** ENVIRONMENTAL MANAGEMENT SYSTEM
- **ISO 45001** OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT SYSTEM
- **GE** CERTIFICATE OF QUALITY CONFORMITY
- **TAI** CERTIFICATE OF QUALITY CONFORMITY
- **TEI** CERTIFICATE OF QUALITY CONFORMITY
- **JOAP** OIL ANALYSIS CERTIFICATION
- **ABO** OXYGENN ANALYSIS CORRELATION
- **TURBOMECA** OIL AND FUEL ANALYSIS CERTIFICATION







2

ND

**AIR MAINTENANCE  
FACTORY DIRECTORATE**

## AIRCRAFT DEPOT LEVEL MAINTENANCE (DLM) & REPAIR ACTIVITIES

Activities include the services of maintenance/test, overhaul, repair and modernization of aircraft, hydraulic, pneumatic, mechanic, electrical and avionics systems under the responsibility of 2<sup>nd</sup> Air Maintenance Factory Directorate (2<sup>nd</sup> AMFD) along with the repair and replacement of structural parts.

### AIRCRAFT UNDER TECHNICAL MANAGEMENT RESPONSIBILITY AND HAVING DEPOT LEVEL MAINTENANCE CAPABILITY

#### TECHNOLOGICAL APPLICATIONS

- Removal and installation procedures for the different types of aircraft heater boots
- Maintenance/repair procedures for propeller spinner and crescents
- Repair procedures for different types of aircraft radomes
- Inspection/repair and maintenance procedures for lifeboats and life vests
- Airframe sealing procedures for different types of aircraft
- Rebuilding damaged composite components (fiberglass and carbon composite laminates, honeycomb etc.) as similar to new ones
- Performing inspection/repair, maintenance and folding procedures on different types of aircraft liferafts
- Canopy and windshield installation procedures
- Bladder type cell repair procedures
- Maintenance and inspection procedures for aircraft tires

C-160



C-130



CN-235



KC-135



T-41



SF-260D



## AIRCRAFT DEPOT LEVEL MAINTENANCE (DLM) & REPAIR ACTIVITIES

### MAINTENANCE CAPABILITY FOR A400M AIRCRAFT

- Due to the experience on aircraft maintenance, the Level H Maintenance Capability for A400M aircraft was obtained in January, 2020.
- As a result of success and experience obtained, the contract which allows A400M modification processes performed by AIRBUS D&S up to now to be accomplished by 2<sup>nd</sup> Air Maintenance Factory Directorate hereafter, was signed accordingly.

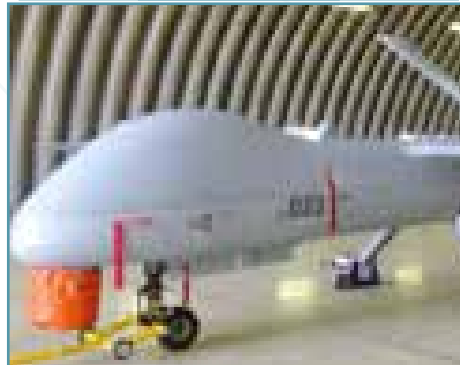


### AIRCRAFT UNDER TECHNICAL MANAGEMENT RESPONSIBILITY

■ E - 7T



ANKA



GÖZCÜ ■



■ GULF IV



CITATION VII



GULF 550 ■



## OVERHAUL OF AIRCRAFT ENGINES

Engine overhaul shop, which performs depot level maintenance and repair activities of aircraft piston engines and accessories, overhaul and maintenance procedures of AEIO-540D4A5 engines used on SF-260D airplanes, IO-360D engines used on T-41D airplanes and Lycoming IO-540-C4D5D engines used on TB-20 airplanes, are performed.

Also, aircraft overhaul shop which possesses the certificate for overhaul and authority of aircraft piston engines up to 450 HP, has the capability for overhauling all series of Lycoming and Continental engines.

### TECHNOLOGICAL APPLICATIONS

With the capability of 0.0005" volume accuracy soft-touch 3-D measurement of aircraft and engine parts & accessories;

- Distance between two points
- Distance between axes
- Distance between two planes
- Coordinates
- Inner/outer diameter
- Out of roundness
- Inclination

- Perpendicularity
- Angle measurements are performed accurately

In the mechanical and chemical cleaning section, aircraft and engine parts are cleaned using following methods;

- Sandblasting
- Glass powder
- Plastic media
- Ultrasonic methods



## OVERHAUL OF AIRCRAFT ENGINES

Test bench procedures are performed by the aid of computer in the Engine Test Cell which has the capability of testing the aircraft piston engines up to 750 HP.

In computer controlled test bench,

- Oil pressure
- Fuel pressure
- Manifold pressure
- Cylinder head temperature
- Oil temperature
- Fuel temperature
- Engine RPM
- Compression leakage control
- Magneto rpm reduction
- External leakage controls of engines of SF-260D airplanes are carried out.

Precision (computer controlled) balancing processes are performed using the Hoffman horizontal and vertical balancing apparatus located in aircraft engine shop. On the vertical balancing apparatus, balancing processes of material up to 153 cm diameter and 113.4 kg weight and on horizontal balancing apparatus, balancing processes of material up to 2.5 m length and 135 kg weight, can be performed accordingly.



## MAINTENANCE AND REPAIR OF AVIONICS SYSTEMS

Maintenance, testing and repair processes of flight instruments, autopilot units, navigation instruments, aircraft engine instruments and general situation instruments of combat, transportation and training aircraft are performed in this shop.

### TECHNOLOGICAL APPLICATIONS & PRODUCT SPECTRUM

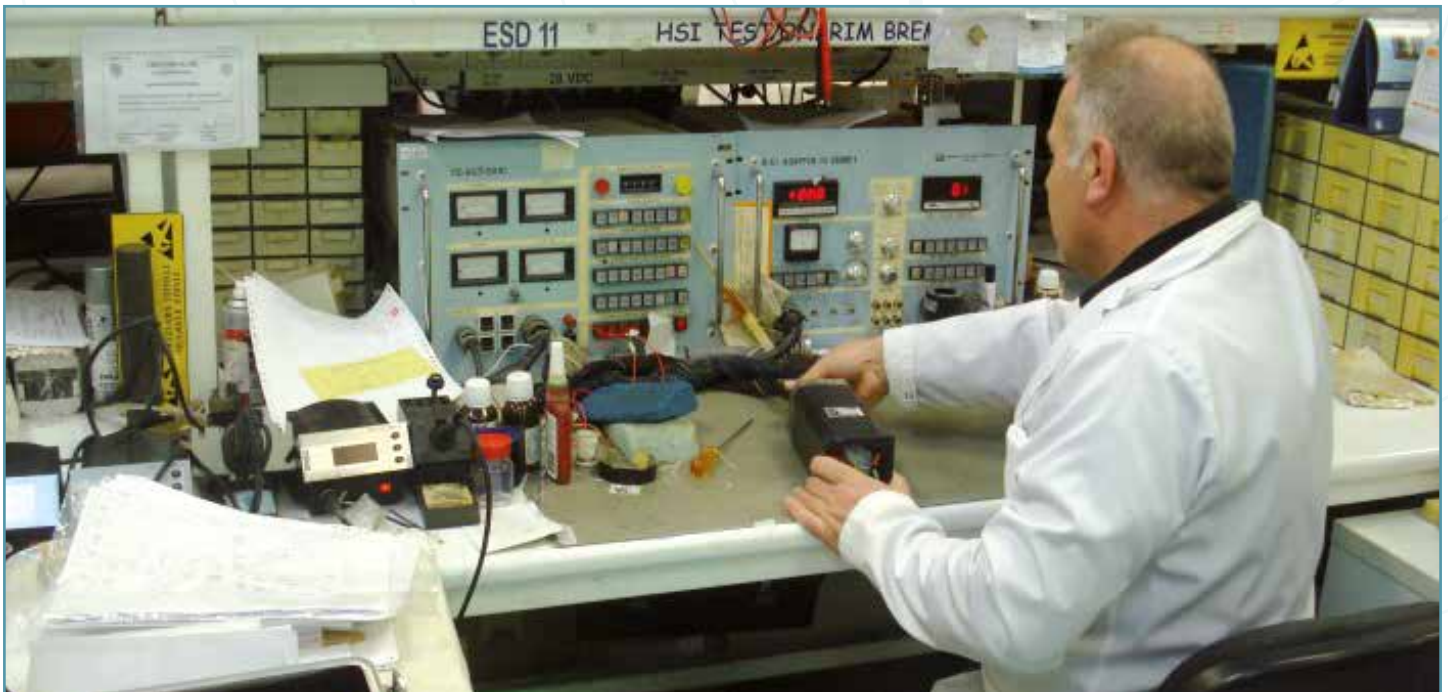
In the flight instruments shops having 300,000 class controlled environmental conditions area of 700 m<sup>2</sup>

- C-130, C-160 aircraft;  
A/P (Autopilot Computers & Access)
- KC-135R aircraft;  
F/D (Flight Director Roll & Pitch Computers)
- C-130, C-160, F-16 and F-4 aircraft;  
HSI (Horizontal Situation Indicator)  
ADI (Attitude Direction Indicator)
- CN-235, C-130, C-160, KC-135R aircraft;  
IAS (Indicated Airspeed)  
TAS (True Air Speed)  
RPM (Revolutions Per Minute)  
FTIT (Fan Turbine Inlet Temperature)  
ACC (Accelerometer)  
AOA (Angle of Attack)  
RMI (Radio Magnetic Indicator)  
ALT (Altimeter)  
PRESS (Indicators, Transmitters,) CLK (Clock)  
FQTY (Fuel Quantity Indicators & Control Amplifiers)
- CN-235 aircraft;  
Servoed Encoding Altimeter,  
CACP (Cabin Area Control Panel)



## MAINTENANCE AND REPAIR OF AVIONICS SYSTEMS

- SALT (Servo Altitude Indicator) of F-16, F-4, KC-135R aircraft
- ENCALT (Encoding Altitude Indicator) of CN-235, C-130, C-160 aircraft are performed.
- At the unique GYRO overhaul center of Turkey, repairs of all types of “Non-inertial”, “Vertical”, “Rate”, “Platform” and “Directional” Gyros are performed accurately. Within the scope of gyrobalancing capability, balancing of gyros up to 25.000 rpm is performed. At GYRO shop which has a 100.000 class clean area of 200m<sup>2</sup>, repair processes of DG (Directional Gyro) of CN-235, C-130, C-160, KC-135R, F-4, F-5, SF-260D aircraft, VG (Vertical Gyro) of CN-235, C-130, C-160, KC-135R, F-4, F-5, SF-260D aircraft and RATE Gyro of F-4, F-5 aircraft are carried out.



## MAINTENANCE AND REPAIR OF ELECTRONICAL SYSTEMS

In the electronical systems shops which have 300.000 class controlled environment and where repairs of systems of communication between aircraft and tower and navigation are performed, the testing, troubleshooting and repair procedures of;

### COMMUNICATION (RADIO) SYSTEMS

- C-130, C-160, KC-135R, UH-1H aircraft; HF (High Frequency)
- C-160, SF-260D, F-4, T-41D aircraft; VHF (Very High Frequency)
- C-130, C-160, KC-135R, F-4 aircraft; UHF (Ultra High Frequency)
- Transceiver control boxes



### RADAR SYSTEMS

- C-130, C-160, CN-235 aircraft; Air Radar units and accessories
- C-130, C-160 aircraft; Doppler Radar units and accessories
- F-16, F-4, C-130, C-160, CN-235, KT-1T aircraft; Altimeter Radar units and accessories

### NAVIGATION SYSTEMS

- C-130, KC-135R, F-16, F-5 aircraft; TACAN (Tactical Air Navigations)
- CN-235, SF-260D aircraft; DME (Distance Measuring Equipment)
- CN-235, SF-260D, C-130, T-41D, C-160 aircraft; ADF (Automatic Direction Finder)
- CN-235, SF-260D, C-130, C-160 aircraft; VOR (VHF Omni-Range) units are carried out.





## RADOME REPAIR AND TESTING LABORATORY

The radome testing laboratory facility, being the only one in its field in our country, can follow currently very high technology such as test program software. The electromagnetic permeability tests of aircraft nose radomes are performed in the radome testing facility. The system which uses microwave technology is controlled by a computer and the refraction angles caused by the tested Radome radar waves are measured. The system consists of a main building where receiver units, radome connection hardware, control console and system computer are located and transmitter tower where X band transmitter, control console are located. Repair and testing of radomes of KC-135R, CN-235, RF-4E, F-4E 2020, F-16C/D, C-130B/E, C-160 aircraft and also radomes of commercial aircraft are performed.

### TECHNOLOGICAL APPLICATIONS

- RFO adjustment with mono pulse bridge
- Testing without radome
- Testing with radome
- Evaluation of measurement results are performed in the computer controlled environment.



## MAINTENANCE, REPAIR AND OVERHAUL OF PROPELLER

At propeller maintenance/repair center, which is the only facility in Turkey and Middle East and which has two each 420 m<sup>2</sup> covered area, maintenance and repair processes of the propellers of piston and turboprop aircraft engines are performed. At propeller shop;

### TECHNOLOGICAL APPLICATIONS

- Maintenance and overhaul processes
- Angle control
- Altitude control
- Balance control
- Parts measurement control
- Adjustment processes
- Corrosion removal
- Control and restoration of propeller anti-ice systems of propellers of C-130, C-160, CN-235, KT-1T, SF-260D, T-41D and commercial aircraft and helicopters are performed



On hydraulic function test bench;

- Angle Adaptation Control
- Feather Angle Control
- Small Pitch Angle Control
- Brake (Reverse) Angle Control
- Hydraulic Pitchlock Control
- Mechanical Pitchlock Control
- Internal and External Oil Leakage Control
- Residual Oil Amount Control on Propellers are performed



Also, material structure and fatigue processes of C-130 aircraft propeller blades by MWM (Meandering Winding Magnetometry) and Sleeve and Spindle revision processes of Cougar helicopters are performed.

## MAINTENANCE AND REPAIR OF AIRCRAFT OIL-FUEL ACCESSORIES

In the oil-fuel shop, maintenance, repair and overhaul of fuel injectors, fuel tanks, fuel filters, oil pumps, oil cooler radiators of aircraft piston engines and oil cooler radiators, fuel level valves, oil and fuel cut-off valves, fuel filters, fuel tanks of Turboprop engines are performed.

- C-130, KC-135R, SF-260D, T-41D aircraft fuel tanks
- C-130, SF-260D, CN-235, F-4E, UH-1H, T-41D aircraft fuel pumps
- C-130, CN-235, KC-135R, SF-260D, T-41D, F-16, F-5, F-4 aircraft fuel cut-off valves
- C-130, CN-235, KC-135R, F-5, F-4 aircraft control valves
- F-16 aircraft; Fuel Transmitter, fuel flow proportioner
- SF-260D, TB-20 aircraft fuel injectors
- C-130, CN-235, TB-20, SF-260D, T-41D aircraft oil radiators repair activities are performed.

On the system of which fuel flow test bench can give flow up to 100.000 PPH, test processes of fuel transmitters, control valves, cut-off valves and fuel pumps are performed by high volume fuel flow bench which has a measurement capability of 0-120 PSI pressure +/- 0.05° with +/- 2.5 % accuracy.

## MAINTENANCE AND REPAIR OF HYDRAULIC SYSTEMS

### PRODUCT SPECTRUM

- Brakes
- Landing Gears
- Batteries
- Valves
- Governors
- Hydraulic Pumps
- Tire Rims
- Pressure and Flow Regulators
- Shock Absorbers
- Cooling Fans



## MAINTENANCE AND REPAIR OF ELECTRICAL SYSTEMS

Maintenance, repair and test of aircraft generators, voltage regulators, control panels, warning relays, alternators, starting motors, spark plugs, cable harnesses, electromechanical power converters, synchronized alternators, magnetos, DC and AC motors, Voltage/Frequency converters, power units, headlights, cranes and starter generators, cooling fans and flow regulators are performed in the electrical systems shop.

### A/C GENERATORS

- Insulation
- Current for revolution control
- Voltage tests

### WIRING HARNESS

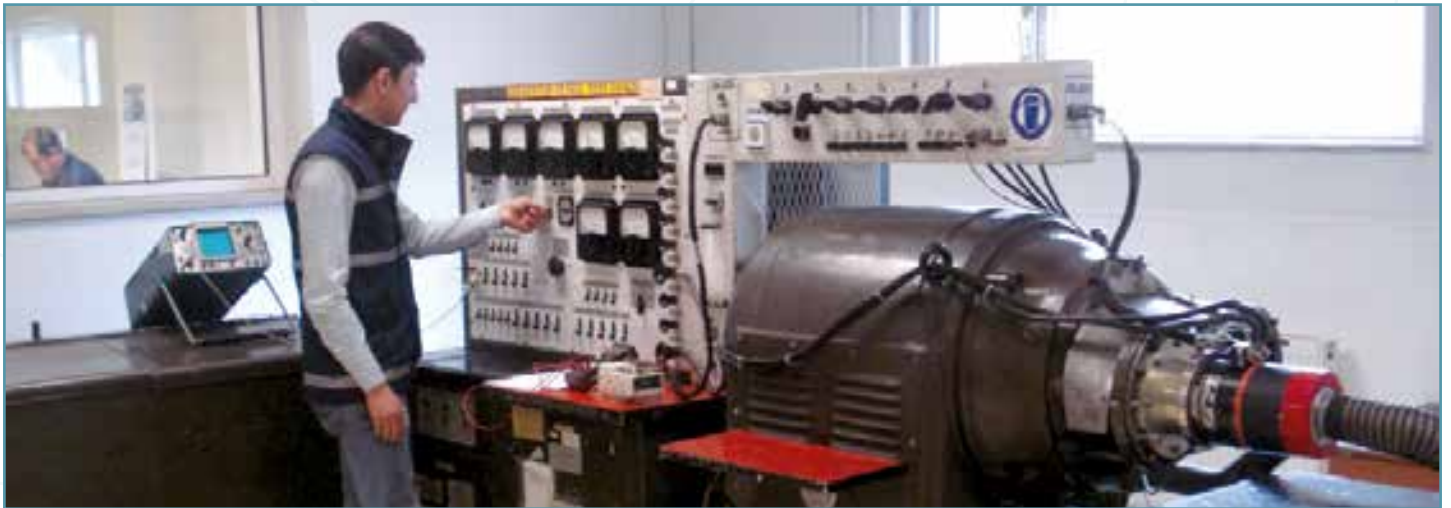
- KC-135R, C-130, CN-235 and F-16 aircraft wiring repair
- Refabrication and reinstallation on aircraft
- Wiring Production

### GENERATOR CONTROL UNIT

- Low voltage
- High voltage
- Frequency
- Short circuit tests

### MAGNETO

- Insulation
- Spark-Plug ignition
- Revolution control tests



## MAINTENANCE AND REPAIR OF AIRCRAFT RUBBER/PLASTIC AND COMPOSITE SYSTEMS

### TECHNOLOGICAL APPLICATIONS

- Propeller heater boots overhaul
- Propeller spinners and crescents
- Aircraft nose radomes
- Liferrafts and life vests
- Aircraft tires maintenance and repair
- canopy mounting and sealing against to the pressure effects on the body and repair of fiberglass parts
- Processes of dehumidifying and baking of radomes and rubber/plastic material
- Repairs of fiberglass parts and revisions of spinners
- Testing and repair of C-130 aircraft liferafts

## MAINTENANCE AND REPAIR OF AIRCRAFT INSULATION AND FURNITURE

### TECHNOLOGICAL APPLICATIONS

For all type aircraft and helicopters

- Cloth and leather shop where sound insulation blankets
- Pilot seats, cushions and pilot beds
- Safety belts are manufactured and repaired.
- Parachutist / passengers seats are manufactured.
- VIP seats are repaired.



## PRECISION MEASUREMENT EQUIPMENT CALIBRATION

The calibration program of AFMETCAL, USAF is applied in PMEL and the calibration procedures are performed IAW technical publications all of which are being updated continually. Environmental conditions for temperature and humidity control and also dust control (100.000 class for 60 m<sup>2</sup> and 300.000 class for 256 m<sup>2</sup> of total area) are obtained 24 hours/365 days in the PMEL which has a covered area of 482 m<sup>2</sup>. Mechanical and electronic calibration procedures are carried out in PMEL which has the Certificate of Superior Success from AFMETCAL.

### MECHANICAL CALIBRATION

#### CAPABILITES

- Micrometers
- Compasses
- Comparators
- Digital and analog scales
- Weights
- Temperature and moisture meter
- Thermocouples
- RPM indicators
- Precision surfaces
- Measurement masters (gages)
- Test adapters
- Torquemeters

### ELECTRONIC CALIBRATION

#### CAPABILITES

- Analog and digital multimeters
- Microwave measurement apparatus
- AC/DC power supplies
- Electronic counters
- Phase meters
- Signal generators
- Panel meters
- Oscilloscopes
- LCR meters
- Special testing systems



## NDI (NON-DESTRUCTIVE INSPECTION)

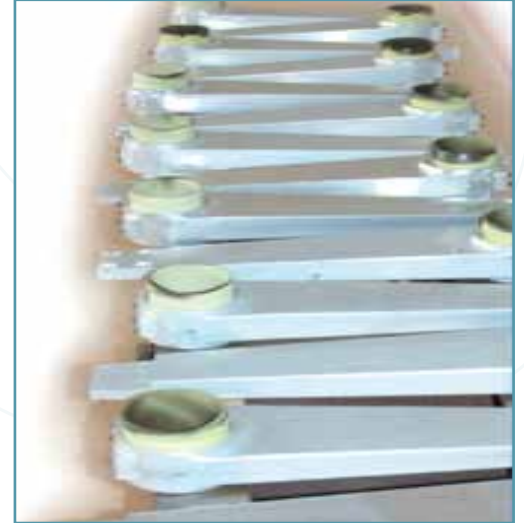
Cracks and foldings, internal voids, all welding defects (penetration defect), corrosion, cold forging and casting defects, forging layers, tears, shrinkage, contraction and other linear defects, raw material and manufacturing defects can be detected during inspections. The personnel who have been certified internationally as LEVEL II carry out NDI (Non-Destructive Inspection) inspection in this shop.

### NDI METHODS

- Fluorescent Penetrant Inspection (ASTM-E-1417)
- Magnetic Particle Inspection (ASTM-E-1444)
- Eddy Current Inspection (ASTM-E-566 & ASTM-E-703)
- Ultrasonic Inspection (ASTM-E-127 & ASTM-E-428)
- Radiographic Inspection (ASTM-E-1742)

### NDI APPLICATIONS

- Aircraft structural parts
- Engines and accessories
- Propellers and their units
- Hydraulic accessories



## MANUFACTURING ACTIVITIES

### AIRCRAFT STRUCTURAL COMPONENTS MANUFACTURING

- Radome manufacturing

### RUBBER TECHNOLOGY

- O-ring
- V-ring
- X-ring
- T-ring
- Bellows
- Packing
- Diaphragm

### COMPOSITE TECHNOLOGY

- Radome manufacturing for ground equipment
- Aircraft canopy manufacturing
- Aircraft structural components manufacturing
- Pilot, parachutist and tank crew helmets





## MANUFACTURING ACTIVITIES

### BALLISTIC PROTECTIVE VEST

- Protection under combat conditions
- Protection in case of armed attacks

### UNDERWEAR VEST

- Weight : 3,000 gr
- Ballistic Resistance (NIJ 0101.04) : II
- Protective Material : UHMVV-PE fabric
- Protection Against : Handguns, MP-5 Automatic Handguns, Automatic Handguns, Sten Automatic Handguns
- Trauma Depth : 30 mm max



### SOLDIER VEST

- Weight : 6,900 gr
- Ballistic Resistance (NIJ 0101.04) : III
- Protective Material : UHMVV-PE Fabric + UHMVV-PE Plate
- Protection Against : Handguns, Automatic Handguns, Rifles
- Trauma Depth : 30 mm Max



## MANUFACTURING ACTIVITIES

### MANUFACTURING TECHNOLOGY

- Milling
- Electrical Discharge
- CNC Wire Erosion
- Grinding
- Turning
- Computer Aided Design and Manufacturing (CAD-CAM)
- Rubber, Plastic, Composite

### HOT WORKS TECHNOLOGY

- Forging
- Casting
- Welding
- Heat Treatment

### FINISHING TECHNOLOGY

- Coating
- Painting



# MANUFACTURING ACTIVITIES

## PARACHUTE MANUFACTURING

- Detachment Landing Parachutes : T-10B ve T-16, T-10R Spare Parachute
- Pilot Parachutes : F-16, F-4E/2020, SF-260D, BA-22
- Seat Parachutes : F-4E/2020, F-16
- Speed Reduction Parachutes : F-16, NF-5 A/B, F-4E/2020 Brake Parachutes
- Load Parachutes : G-12D, 28-15 Feet Load Parachute

## BALLISTIC PROTECTIVE INFANTRY HELMET

- Structure : Composite
- Fiber Material : UHMW-PE
- Matrix Material : Phenolic Resin
- Total Helmet Weight : 1.5 kg
- Average Helmet Thickness : 9-10 mm
- Suspension System : Shock Absorber
- Resistance to Weapons : Resistance to pistols and Hand grenades
- Ballistic Performance : 550-620 m/sec
- Trauma Depth : 25 mm

## PROTECTIVE PILOT HELMET

Protective flying helmet for jet aircraft and helicopters. Communication system available wearable, night vision goggles system, oxygen mask attachable to the helmet with dark and transparent visor options.

- Protective material : Epoxy/fiberglass reinforced plastic
- Weight : 1,050-1,100 gr
- Impact resistance : Shock absorbing polyurethane pads



## MANUFACTURING ACTIVITIES

### ENGINE TRANSPORTATION STAND

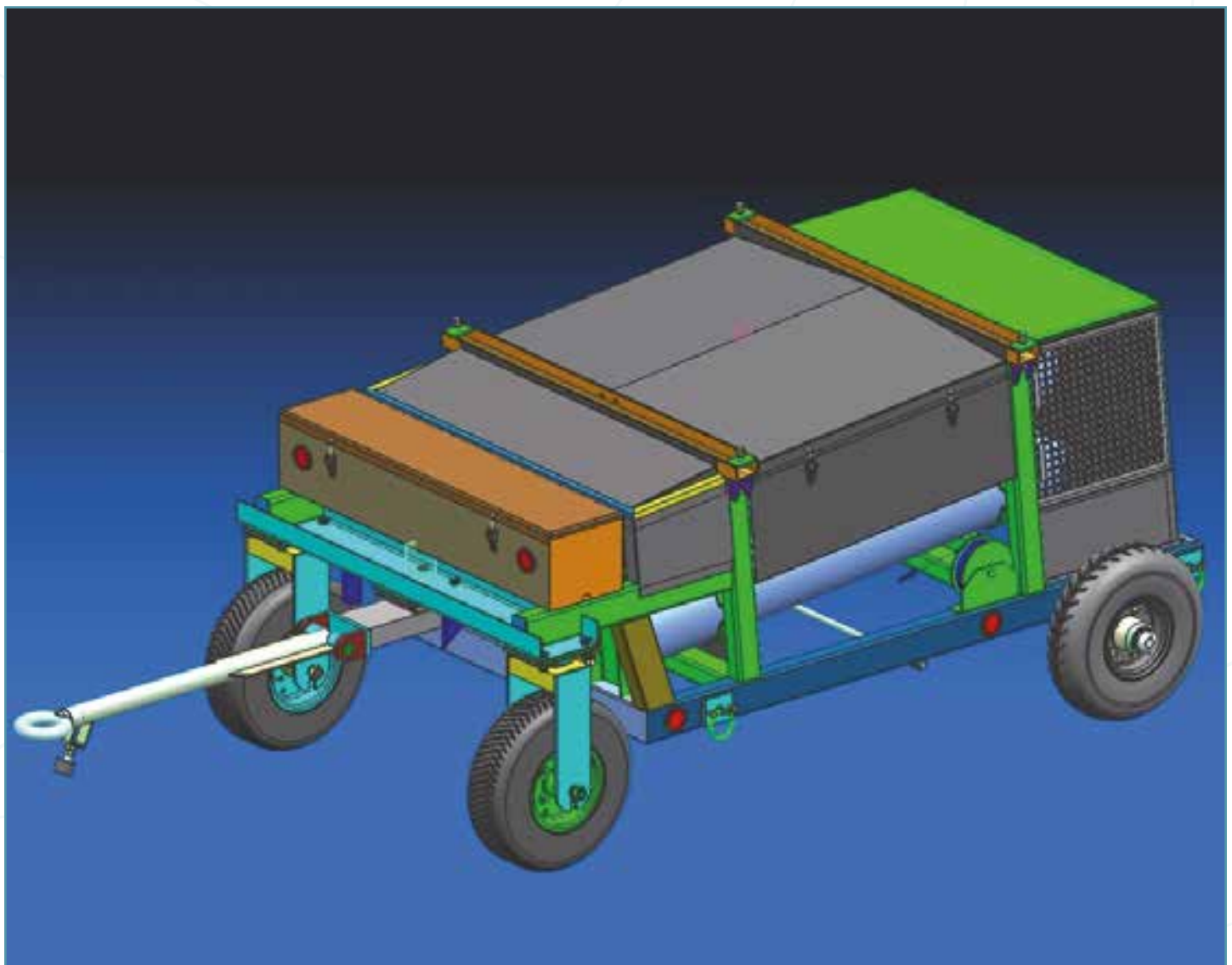
Used to transport F-16 Engine through CN-235 A/C.

Platform Width	: 2,135 mm
Platform Length	: 3,290 mm
Load Capacity	: 2,000 kg
Empty Weight	: 1,190 kg

### GAS OXYGEN TRANSPORTATION TRAILER

Used to fill A/C oxygen cyclinders.

- 8 cyclinders
- Each cyclinder has a pressure of 2800 PSI and a volume of 50 lt.



# MANUFACTURING ACTIVITIES

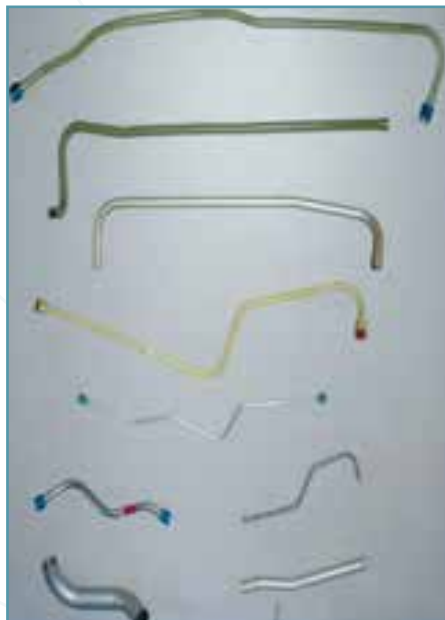


## SHEET METAL FORMING TECHNOLOGY

- Pot die
- Form Press
- Punch Press
- Stretching and Shrinking Bench
- Router

## HOSE/TUBE MANUFACTURING

Manufacturing and testing procedures of low, medium and high pressure tubes belonging to C-130, C-160, KC-135R, CN-235, SF-260D and T-41D are carried out.



# MANUFACTURING AND OVERHAUL OF GROUND SUPPORT EQUIPMENT

## BOMB LOADER (SEYIT ONBAŞI)

The order for producing a bomb loader vehicle that shall cover also the JSF aircraft were given by TurAF in the year 2011, a prototype bomb loader was produced in 2013 and a decision was made to perform mass production as of the year 2014.

Up to now, 22 each were manufactured and total 48 each to be manufactured more until 2023. All of the parts, except the differential system, are domestic production and approximately 75 percent of domestic production parts have been manufactured by 2<sup>nd</sup> AMFD.

It is capable of loading and unloading ammunition such as missiles, bombs and similar external loads on board of all fighters in TurAF inventory. In addition, thanks to the additional capability of the remote control system on the bomb loading vehicle Seyit Onbaşı, which its equivalent bomb loaders MJ-1 and MJ-1TR have no such a feature, Seyit Onbaşı submits safe, accurate and easy loading/ unloading operations for its operators.

### Dimensions

Length	: 3,850 mm
Width	: 1,250 mm
Height	: 1,070 mm
Weight	: 1,800 kg

### Lifting Capacity

On the Plate	: 1,360 kg (3000 lbs.)
On the Prong (Fork)	: 1,020 kg (2250 lbs.)

### Loading Performance

Minimum distance, platform to ground	: 15.8 cm (6,25")
Maximum distance, platform to ground	: 198 cm (78")
Minimum distance, fork to ground	: 2.5 cm (1")
Maximum distance, fork to ground	: 184 cm (72,5")

### Vehicle Mobility

Maximum Speed, Loaded	: 16 km/h (10 mph)
Breaking Distance, Loaded	: 4.88 m (16 ft)
Level of Gradeability, Loaded	: 10 %
Level of Gradeability, Unloaded	: 20 %
Transmission System	: Hydraulic

### Engine

Model No.	: 9LD625-2
Power	: 28 HP
Number of Cylinder(s)	: 2
Cooling System	: Air Cooled
Fuel Type	: Diesel
Noise Level	: 84 db (A) maximum (unloaded 7m 1500 RPM)

### Steering System and Wheels

Steering System	: Hydraulic
Wheel Track (Tread)	: Rear 107 cm Front 73 cm
Tires	: 5.00-8, 8 plies pneumatics rubber tire
Diameter of Steering Wheel	: 35 cm
Turning Radius	: 3,3 m



# MAINTENANCE, REPAIR AND RENOVATION OF GROUND SUPPORT EQUIPMENT AND LIGHT WEAPONS

- Repair and maintenance of air conditioning, ventilation and firefighting systems
- Repair, maintenance and refilling of the fire extinguishers
- Repair and maintenance of the mechanical and electronic benches and equipment
- Production, filling and testing processes for the oxygen and nitrogen
- Maintenance and repair of oxygen and nitrogen generator
- Maintenance and repairs of Aircraft Arrested Systems such as Hook, Net and Mobile Barrier
- Aircraft Starters
- Illuminating Devices
- Generators and Winding
- Compressors
- G-3 Machine Gun
- MG-3 Machine Gun
- Light Weapon Systems



# MAINTENANCE, REPAIR AND OVERHAUL OF MOTOR VEHICLES AND HEAVY DUTY VEHICLES

## MOTOR VEHICLES, HEAVY DUTY VEHICLES

- Aircraft refuellers
- Aircraft towing vehicles
- Aircraft fire-fighting vehicles
- Vacuumed runway scavengers
- Snow plowers and blowers
- Cranes
- Engine overhaul and maintenance
- Runway rubber skid marks removers





## PRODUCTION OF AIRCRAFT TOW TRACTOR, RAHVAN

The Rahvan Aircraft Tow Tractor Project has been initiated by 2<sup>nd</sup> AMFD in 2010 in order to meet the needs for aircraft towing within the national possibilities, which are economical in terms of maintenance, sustainability and operation using common spare parts, easy to use and in a standardized structure in compliance with international standards and it can be repaired and given to service in a short time. After a prototype was manufactured, a mass production concept was started in 2014. 90 units have been manufactured up to now and additionally 47 each shall be manufactured through the new configuration.

### TECHNICAL CHARACTERISTICS

Reversing Camera, Automatic Air Conditioner, Steering Wheel Controlled Rear Differential (Crab, Coordinated Maneuvers), Standard Closed Cabin, 12V Output for Trailer, Inner Cabin Controlled Floodlight, Clutch Parking Brake

Engine	: Tumosan, 4DT39, Turbo-Diesel
Power	: 95 HP @2,500 Rpm
Torque, Maximum	: 370 Nm @1,500 Rpm
Gear Case	: Powershift, Full Automatic
Steering Wheel	: Hydraulic with self-contained pump
Brake	: 5 Pl. Oil Immersed Hydraulic
Thrust	: 4 Wd
Manoeuvre	: 4 Ws
Turning Radius	: 4,400 mm
Speed	: 32 km/h Max. (Forward/Reverse)
Weight	: 5,250 kg
Length	: 4,000 mm
Width	: 2,400 mm
Height	: 2,650 mm (2,350 mm excluding strobe light)
Height Above Ground	: 330 mm
Angle of Approach	: 41°
Angle of Departure	: 28°
Number of Occupants	: 2+4



## SERVICES OF THE QUALITY LABORATORY

### PHYSICS/CHEMISTRY LABORATORY

- Shelf Life Item Inspection
- Strength Tests (Pulling, pressing, cutting)
- Chemical process control tests
- Chemical material analyses
- Hardness checks

PHYSICS LABORATORY



CHEMISTRY LABORATORY



### METALLURGY LABORATORY

- Composition of metal materials
- Damage mechanisms determination
- Process control tests
- Certification tests



### OIL/FUEL LABORATORY

- Water-methanol mixtures control
- Contamination control for hydraulic fluids
- Determining microorganisms in aircraft fuels



## SERVICES OF THE QUALITY LABORATORY

### TEXTILES LABORATORY

- Strength of Breaking, Tearing and Exploding
- Air permeability
- Determining Waterproofness
- Determining burning level
- Sensitivity to washing, dry-cleaning, friction and color photosensitivity
- Determining filling-warp and weaving types
- Material type identification



### RUBBER LABORATORY

- Vulcanization time testing
- Low-temperature testing
- Physical performance tests (hardness, density, tensile strength)
- Tests those applied after ageing in oil, fuel and air
- Purity tests for inhalation oxygen



## QUALITY APPROVALS AND CERTIFICATES

- **AS 9100(C)** QUALITY MANAGEMENT SYSTEM FOR AVIATION, SPACE AND DEFENCE ORGANIZATIONS
- **AS 9110(D)** QUALITY MANAGEMENT SYSTEM FOR AVIATION MAINTENANCE ORGANIZATIONS
- **ISO 9001** QUALITY MANAGEMENT SYSTEM
- **ISO 14001** ENVIRONMENTAL MANAGEMENT SYSTEM
- **AQAP 2110** NATO QUALITY ASSURANCE REQUIREMENTS FOR DESIGN, DEVELOPMENT AND MANUFACTURING
- **SHY-145** APPROVED MAINTENANCE ORGANIZATION CERTIFICATE
- **ISO 45001** OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT SYSTEM
- **AFMETCAL** UNITED STATES AIR FORCE METROLOGY AND CALIBRATION PROGRAM CERTIFICATE OF COMPLIANCE





3

RD

**AIR MAINTENANCE  
FACTORY DIRECTORATE**

## ELECTRIC SYSTEMS

### PRODUCT RANGE

#### Maintenance and Repair

##### Capabilities

- Electrical motors
- Static and dynamic uninterrupted power supplies
- Static and dynamic frequency converters
- Invertors, redresors, voltage regulators
- Airfield lighting with low and average voltage underground cables failures
- Airfield lighting systems
- Disconnectors and circuit breakers
- Low and average voltage transformer and special type transformers

#### Manufacturing Capabilities

- Automatic fire detection and warning system panels
- Constant Circuit Regulator (It is a power supply enabling that the airfield lighting unit comes on in five stages and with constant brightness.)
- Remote control board for the airfield lighting
- Internal and external main distribution, compensation and special type panels



## AUTOMATIC FIRE DETECTION AND WARNING SYSTEM

Automatic Fire Detection and Warning System (AFDWS); detects fire by detectors environmental changes associates with fire e.g smoke and heat. AFDWS warns the occupants by sound, lights and phone to enable that they evacuate the building in case of fire.

- Detection Zones: 8 Zones
- Supply Voltage: 220 VAC.  $\pm$  %5 and 24 VDC.  $\pm$  %5
- Operating selecttable: Conventional System
- Operating Temperature: -10 °C to +55 °C
- It can be used in the fire extinguishing system in case of need.



## CONSTANT CURRENT REGULATOR

Thyristor type constant current regulator; specially designed for supply and control of airport lighting systems.

- Select Of Power: 5, 7.5, 15 kVA
- Supply Voltage: 220 V.  $\pm$ 5% 50 Hz. For 5 kVA, 380 V.  $\pm$ 5% 50 Hz. For 7.5 and 15 kVA
- Output Nominal current: 6,6 A.
- Operating Temperature: -20 °C to +55 °C
- Operating Selectable: Remote or Local control



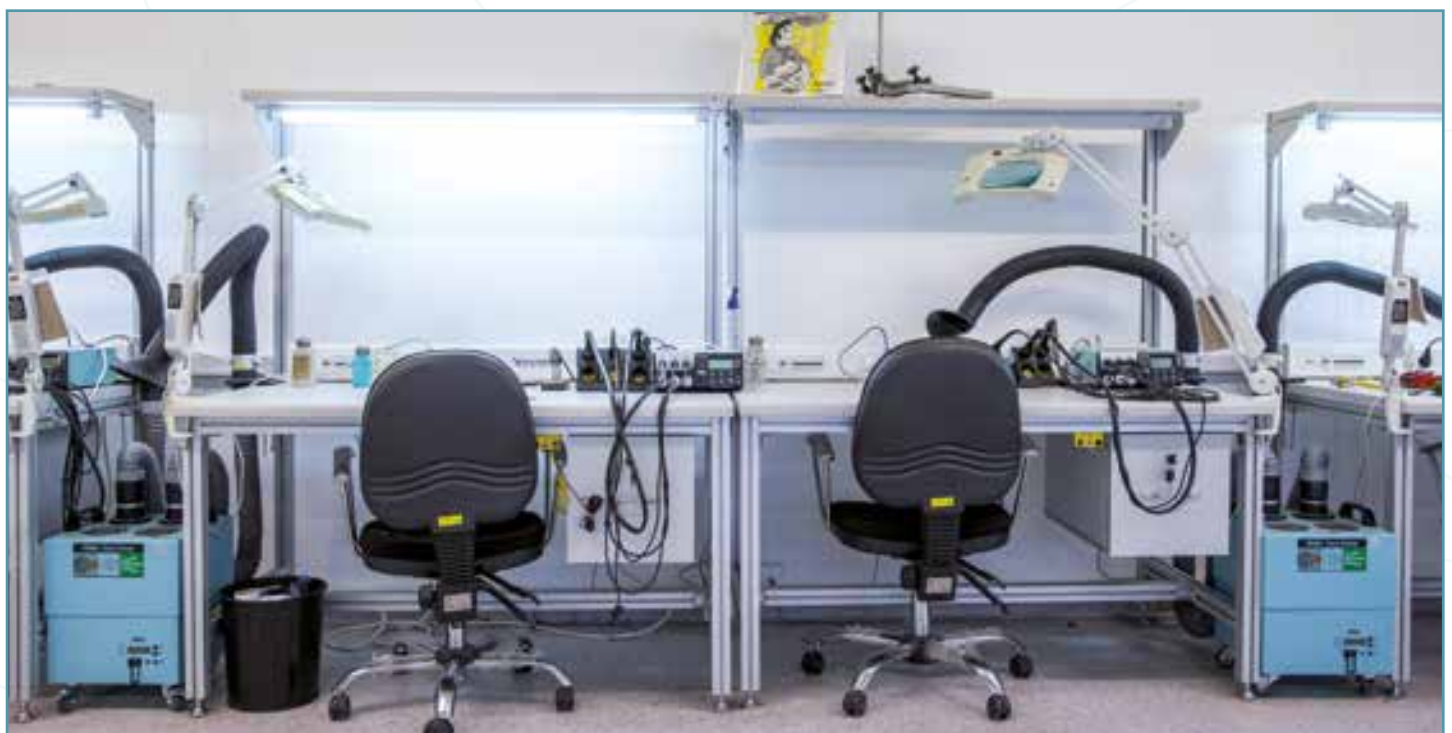


## ELECTRONIC/PRECISION SOLDERING LABORATORY

### SOLDERING REQUIREMENTS FOR IPC J-STD-001 ELECTRICAL AND ELECTRONIC TOOLS

IPC Certified Technical Personnel (CIS) Training is offered to TurAF technical personnel in our Precision Soldering Laboratory established under our institution, by ICP Certified Instructors (CIT) as per recent technologies. Training demands of the Public and Private Sectors are met.

The training is offered in a 5-day period at our classroom having a 10-trainee capacity. IPC J-STD-001 training is valid for 2 years. Refresher trainings are also offered if demanded. The staff who achieve the training successfully are awarded the certificates of IPC (INSTITUTE PRINTED CIRCUITS) CIS (CERTIFIED IPC STUDENT).



## MECHANIC SYSTEMS

### TECHNOLOGICAL APPLICATIONS

#### Machining

- Simultaneous 5-Axis Machining
- C-Y Axis Turning Centers
- Electro-Erosion
- Grinding, Blending

#### Plastic Forming

#### Metal Sheet Forming/Drilling/Bending

#### Welding

#### Painting

#### Maintenance/Repair

#### Vertical Process Workbench

Having various alloys; brass, aluminum and steel materials can be processed with the sensitivity of  $\pm 0.01$ .

#### Plastic Injection Workbench

All types of plastic and thermoplastic items up to 225 gr can be pressed.

#### Designed and Manufactured Weapon Systems

Onur Fuzes



# MUNITION AND WEAPON SYSTEMS

## PRODUCT RANGE

### Weapon Systems, Maintained And Repaired

- D-VII B, L70 Air Defence Fire Control Radar System
- D-IX, Oerlikon Air Defence Fire Control Radar System
- AGM-65A/B and TGM-65A/B MAVERICK Air to Ground Missile Guidance Unit
- GBU-10, GBU-12 (LGB) Air to Ground Laser Guided Bomb, Computer and Control Section
- Rapier Low Level SAM System, 2<sup>nd</sup> Line Level LRU, 3<sup>rd</sup> Line Level SRU Maintenance and Repair
- Rapier Low Level SAM System Tracker Radar
- HAWK SAM System

### Weapon Systems, Maintained and Repaired at Intermediate Level

- AIM-120B ve AIM-120C7 AMRAAM AIR to AIR Missile System

### Weapon System, Manufactured

- HGK-1 Precision Guidance Kit
- HGK-82 Precision Guidance Kit
- ONUR-1 Mod-3 Bomb Fuze System
- ONUR-1 Mod-4 Bomb Fuze System



## MUNITION AND WEAPON SYSTEMS

### HGK-1 PRECISION GUIDANCE KIT

HGK-1 is a GPS/INS guidance kit that turns existing 2000 lb MK-84 general purpose bombs and penetrator bombs into air to ground smart munitions.

- Certified to F-16 PO-III and F-4E/2020 aircrafts
- MIL-STD 1760 compliance
- Operation in all weather conditions
- Jam resistant
- Re-targeting during captive flight
- CEP value: <10 m with INS/GPS, <25 m CEP value with only INS
- Range: 28 km



### HGK- 82 PRECISION GUIDANCE KIT

HGK-82 is a GPS/INS guidance kit that turns existing 500 lb MK-82 general purpose bombs into air to ground smart munitions which can be released multiple by using BRU 57 ejector rack.

- Multiple release capability by using BRU 57 ejector rack
- Re-targeting during captive flight
- Jam resistant
- Operation in all weather conditions day and night
- CEP value: <10 m with INS/GPS, <25 m CEP value with only INS
- Certified to F-16 PO-III and F-4E/2020 aircrafts
- MIL-STD 1760 compliance
- Range: 25 km



# MUNITION AND WEAPON SYSTEMS

## ONUR-1 MOD-3 BOMB FUZE SYSTEM

Onur-1 Mod-3 Fuze is an electro-mechanical impact/short-long post impact delay fuze system developed for use with general purpose MK-series bombs.

- Compatible with most in-service general purpose bombs and weapon guidance kits ((GBU-31 JDAM, GBU-38 JDAM, GBU-10 LGB, GBU-12 LGB, HGK (Precision Guidance Kit) series, LGK (Laser Guidance Kit) series
- Arming and Post Impact Delay can be manually set
  - ✓ Arming Time up to 18 sec.
  - ✓ Impact "O" delay
  - ✓ Post Impact Delay-Short (up to 800 ms)
  - ✓ Post Impact Delay-Long (up to 60 hours)
- Anti-Disturbance Function for long post impact delays
- High Altitude Release Capability
- Reliability: > %95
- Shelf Life: 10 years
- Service Life: 1 year
- Easily Dismountable Booster.
- Qualified for requirements MIL-STD-331
- Operating Temperature: -40 °C /+71°C
- Storage Temperature : -54 °C / +85°C
- Interrupted Explosive Train
- Power Initiator: Safety Block without Battery (Lanyard activated air-driven turbine alternator)



## MUNITION AND WEAPON SYSTEMS

### ONUR-1 MOD-4 BOMB FUZE SYSTEM

Onur-1 Mod-4 is an electro-mechanical fuze developed for use with Penetrator Bomb as Augmenting Charge Fuze.

- Arming delay can be manually set up to 18 sec
- High Altitude Release Capability
- Reliability : > %95
- Shelf Life: 10 years
- Service Life: 1 year
- Qualified for requirements of MIL-STD-331 and MIL-STD-810
- Operating Temperature: -40 °C / +71°C
- Storage Temperature : -54 °C / +85°C
- Interrupted Explosive Train
- Power Initiator: Safety Block without Battery (Lanyard activated air-driven turbine alternator)
- Ability to Function with
  - ✓ External Crush Switch
  - ✓ Internal Impact Sensor



## AVIONICS

We provide maintenance and repair services to the subsystems of all aircraft and helicopters in TurAF inventory Maintenance, repair and modernization of

- All types of intercom and wireless communication systems
- Inertial Navigation Systems
- IFF

Depot level maintenance, repair, modification and modernization of

- INS
- TACAN
- Auto pilot
- Radar warning receivers
- Air Combat Maneuvering Instrumentation (ACMI) Pod
- Electronic Warfare Pod

Maintenance and repairs of

- Pilot Night Vision Goggles are executed. In addition to this, circuit boards of these avionic systems can be repaired, maintained and modernized and tested by automatic test stations.



## ELECTRONIC WARFARE SYSTEMS

It performs depot level maintenance and repair of totally 120 units for the Electronic Warfare Systems of C-130, F-4 and F-16 Aircraft.

### PRODUCT RANGE

- Analysis Processor
- Processor, Radar Data
- Superheterodyne Receiver
- Superheterodyne Controller
- Junction Box
- C/D Receiver Assy
- Display, Radar Set
- Auxilary Sys. Con.
- Prime Sys. Con.
- Power Sup.
- Power Amp.
- Delay Line Unit
- ECM Generator
- Aft Repeater Assy
- Cockpit Control Unit
- Switching Group
- Filter, Highly Permeable
- Chaff-Flare Section, Munitions
- Dispenser, General Purpose



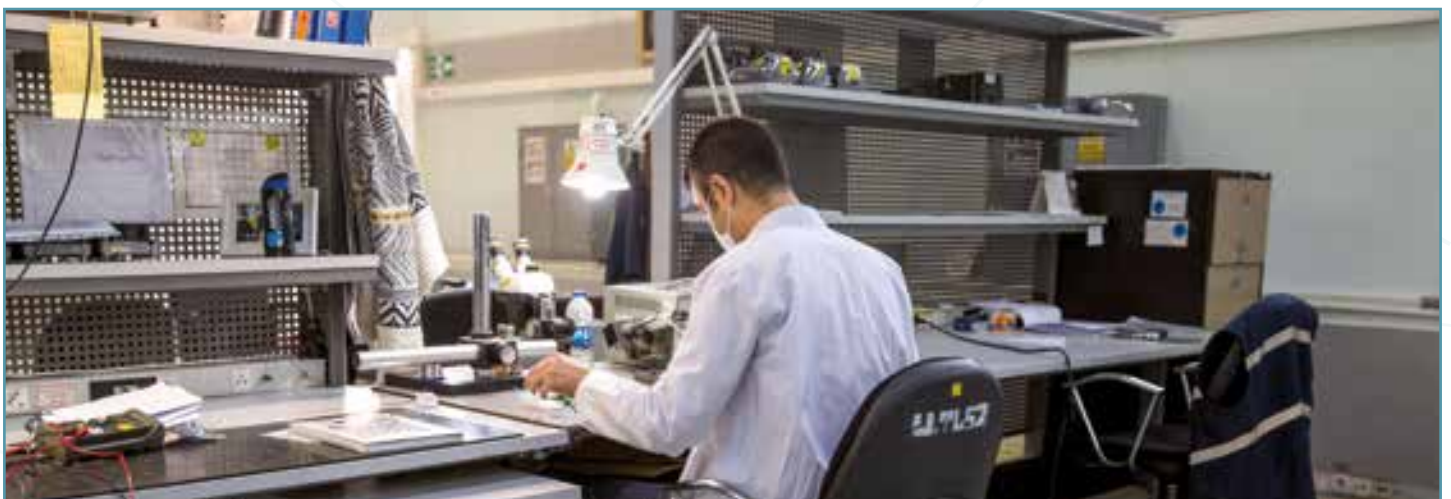


## AIRCRAFT RADIO AND IDENTIFICATION SYSTEMS

Maintenance and repair activities for radios, internal communication systems, IFF systems on fighter aircraft, bombing aircraft, transport aircraft and training aircraft in TurAF inventory and CSFDR system (Black Box), brake system, thermal camera and pilot night vision goggles on F-16 aircraft in TurAF inventory are performed.

### PRODUCT RANGE

- External Communication Units
- Panels
- Internal Communication Units
- Cards of Avionic units
- IFF system units
- Night vision goggles
- Anti / Skid system
- Thermal camera system



## AIRCRAFT NAVIGATION SYSTEMS

Depot level maintenance and repair activities for Aircraft INS, TACAN, VOR/ILS, DME, AUTOPILOT, RADAR ALTIMETER, RELAY BOX, DED POWER SUPPLY, ANGLE OF ATTACK COMPUTER and ACMI POD flight systems in Turkish Armed Forces inventory are performed.

### PRODUCT RANGE

- Aircraft INS (LTN-92)
- Aircraft TACAN (AN/ARN-153 and AN/ARN-118)
- VOR/ILS (KNR-634A)
- Cards and chasis of avionic units
- AUTOPILOT (APC-65F)
- ACMI POD



## CONTROLLED CRYPTOGRAPHIC ITEMS (CCI)

Distribution, accountancy, failure recording activities and failed items sending activities to foreign countries for 19 items of foreign Controlled Cryptographic Items (CCI) are made in the CCI Workshop.

Failure detections of MIDS terminals (LVT-1, LVT-6, LVT-11) and their power supplies on Link-16 systems are performed by means of VLATS Test Station and LEGS program of the test station and the items are serviceably returned to service. Failed MIDS terminals are made serviceable in the CCI Workshop by ViaSAT Company Personnel within the scope of On site Engineering Contract. Terminals of which failures cannot be eliminated are sent to ViaSAT/USA.



## RADAR AND NAVIGATION

- Transmitter and receiver units of Stationary and mobile radars which are one of the most important factor of air defence
- Computer displays
- Printed Circuit boards
- Tactical air navigation systems (TACAN,ILS) units which can give directions to aircraft in all weather conditions
- Radar precision control and ground control approach (RAPCON-GCA)
- Identification of friend or foe systems can be maintained, repaired and modernized. In addition to that maintenance on site is carried out.



# COMMUNICATIONS

## TECHNOLOGICAL APPLICATIONS

- Ground/ground, ground/air HF, UHF, VHF Have Quick radios
- Communication systems in shelters
- Analog and digital switchboard, telephone, telem and voice recording systems
- Air/air, air/ground target detection systems can be maintained, repaired and modernized.
- Production of various electronic cards and target detection systems



## ELECTRONIC POWER SUPPLIES

All types of power supplies of air and ground systems can be tested and repaired by using softwares and test devices produced by 3<sup>rd</sup> AMFD.

Because only a few centers have such capabilities in the world, we also provide services for NATO countries.



## PRECISION MEASUREMENT EQUIPMENT CALIBRATION

Calibration service in 1000 m<sup>2</sup> closed area with continuously controlled and monitored temperature, relative humidity, lighting, positive pressure.

In addition to this, on Site calibration service is provided with Transportable Field Calibration Unit (TFCU) which are specially designed for the subsystems which are fixed or not transportable and have short calibration intervals.

Standard equipment are traceable to National Metrology Institute/Turkey (UME) and NIST/ USA Quality and Management System are performed in compliance with T.O. 00-20-14 U.S. Air Force Metrology and Calibration Program. The calibration service is evaluated and certified by Air Force Metrology and Calibration (AFMETCAL/USA) Program.

It has model certificate for quality guaranty implemented for maintenance institutions.

It renders services to public and private sector via its revolving fund system.

In addition, it offers consultancy services for establishing quality laboratories, determining device requirements and training.



# PRECISION MEASUREMENT EQUIPMENT CALIBRATION

## CALIBRATION CAPABILITIES

### Mechanical Calibration

- Pressure Calibration
- Dimensional Calibration
- Autocollimator, theodolites
- Granite table surface with laser/planecator
- Roundness
- Parallelism and perpendicularity
- Optical glass surface smoothness
- Temperature Calibration
- Force Calibration
- Mass & Balance Calibration
- Torque Calibration

### Electronic Calibration

- AC/DC Voltage Calibration
- AC/DC Current Calibration
- Resistance Calibration
- Inductance Calibration
- Capacitance Calibration
- Phase Calibration
- Attenuator Calibration
- Low/High Level Powermeter Calibration
- Frequency Calibration
- Analog/digital oscilloscope calibration
- Microwave Instruments Calibration

## ON-SITE CALIBRATION CAPABILITIES

### Electric/Electronics Calibration

- AC/DC Voltage
- AC/DC Current
- Capacitance
- Frequency
- Oscilloscope
- Microwave

### Mechanical Calibration

- Pressure
- Torque
- Temperature
- Scale





# CERTIFICATES

- **AQAP 2110** NATO QUALITY ASSURANCE REQUIREMENTS FOR DESIGN, DEVELOPMENT AND MANUFACTURING
- **AS 9110(C)** QUALITY MANAGEMENT SYSTEM FOR AVIATION, SPACE AND DEFENCE ORGANIZATIONS
- **AS 9100(D)** QUALITY MANAGEMENT SYSTEM FOR AVIATION MAINTENANCE ORGANIZATIONS
- **ISO 9001** QUALITY MANAGEMENT SYSTEM
- **ISO 14001** ENVIRONMENTAL MANAGEMENT SYSTEM
- **ISO 45001** OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT SYSTEM
- **ISO 31000** RISK MANAGEMENT SYSTEM CERTIFICATE
- **AFMETCAL** UNITED STATES AIR FORCE METROLOGY AND CALIBRATION PROGRAM CERTIFICATE OF COMPLIANCE





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MAIN MAINTENANCE  
FACTORY DIRECTORATE

## DEPOT LEVEL MAINTENANCE AND REPAIR ACTIVITIES (DLM)

5<sup>th</sup> Main Maintenance Factory Directorate performs depot level maintenance/repair and overhaul activities for airframe, engine and parts of aircraft/helicopters under its responsibility.

### TECHNOLOGICAL APPLICATIONS

#### For helicopters/aircraft;

- Airframe overhaul & maintenance and repair
- Modernization and R&D activities
- Maintenance, repair and overhaul for engines, gear box, maintenance, repair and overhaul of main/tail rotor blades, propellers and components
- Avionic devices maintenance, mechanic and electronic calibrations
- Maintenance, repair and overhaul of power train and accessories
- Manufacture
- Paint removal (chemical, bead blasting)
- Painting activities
- Chemical activities
- Surface finishing activities
- Nondestructive inspection
- Machining and production activities
- Laboratory activities
- Engineering (Technical) support

### PRODUCT RANGE

#### ■ T-129 ATAK



# DEPOT LEVEL MAINTENANCE AND REPAIR ACTIVITIES (DLM)

## PRODUCT RANGE

■ T-129 ATAK



UH-1H



■ AH-1W SUPER COBRA



■ AH-1P COBRA



SIKORSKY S-70



■ SIKORSKY S-70B



■ CH-47F



AS-532 COUGAR



■ AB-206



■ CESSNA T182T



B-200



# MODERNIZATION PROGRAM

5<sup>th</sup> Main Maintenance Factory Directorate performs depot level maintenance/repair and overhaul activities for airframe, engine and parts of aircraft/helicopters under its responsibility.

## MODERNIZATION ACTIVITIES

- Helicopter obstacle avoiding system integration includes
  - Tablet Solution
  - Active obstacle avoiding system
  - Passive obstacle avoiding system
- Identification friend and foe systems (IFF MODE-5) integration
- Helicopter electronic warfare systems (HEWS) integration
- Installation/Integration of Multi-Band Numerical Joint Radio (MBNJR)
- Emergency Locator Transmitter (ELT Device) Integration
- Satellite Phone Integration for Search and Rescue Helicopters
- Aircraft Cockpit Voice and Flight Data Recorder (CFDR) Integration
- HEWS activities include
  - Infrared Exhaust Heat Suppression Systems (IEHSS)
  - Infrared Counter-Measure Systems (ICMS)
  - Counter-Measure Dispensing System (CMDS)
  - Missile Warning System (MWS)
  - Hews Radar Warning Receiver System (HRWRS)
  - Radar Frequency Jamming System (RFJS)
  - Laser Warning Receiver System (LWRS)
  - Suit Central Administration Unit (SCAU)

IFF MODE-5 ■



IFF-MODE-5  
NATIONAL  
IFF MK XIIA(S)

HEWS ■



## WITHIN THE SCOPE OF AFOREMENTIONED ACTIVITIES

- S-70A-28DSAR Helicopters Integration
- AS-532USAR Helicopters Integration

SATELLITE PHONE ■



AIRCRAFT COCKPIT VOICE AND FLIGHT DATA RECORDER ■



## OVERHAUL / MAINTENANCE / REPAIR PROGRAMS

5<sup>th</sup> Main Maintenance Factory Directorate performs depot level maintenance/repair and overhaul activities for airframe, engine and parts of aircraft/helicopters under its responsibility.

### TECHNOLOGICAL APPLICATIONS

#### AH-1W ATTACK HELICOPTERS

(Engine and accessories, power train, blade/propeller, hydraulics, airframe installation, structural repair, avionics)

#### AH-1P ATTACK HELICOPTERS

(Engine and accessories, power train, blade/propeller, hydraulics, airframe installation, structural repair, avionics)

#### UH-1H&AB205 UTILITY HELICOPTERS

(Engine and accessories, power train, blade/propeller, hydraulics, airframe installation, structural repair, avionics)

#### AB-212 UTILITY HELICOPTER

(Power train, blade/propeller, hydraulics, airframe installation, structural repair, avionics)

#### AB-412 UTILITY HELICOPTER

(Power train, blade/propeller, hydraulics, airframe installation, structural repair, avionics)

#### AS-532 UTILITY HELICOPTER

(Power train, blade/propeller, hydraulics, airframe installation, structural repair, avionics)

#### S70-A UTILITY HELICOPTER

(Engine and accessories, power train, blade/propeller, hydraulics, airframe installation, structural repair, avionics)

#### S70-B UTILITY HELICOPTER

(Engine and accessories, blade/propeller, hydraulics, airframe installation, structural repair, avionics)

#### AB-206 TRAINING HELICOPTER

(Engine and accessories, power train, blade/propeller, hydraulics, airframe installation, structural repair, avionics)

### AIRCRAFT

#### B-200 AIRCRAFT

(Accessories, blade/propeller, hydraulics, structural repair, avionics)

#### C-421B TRAINING AIRCRAFT

(Engine and accessories, blade/propeller, airframe installation, structural repair, avionics)

#### T-182T TRAINING AIRCRAFT

(Engine and accessories, blade/propeller, airframe installation, structural repair, avionics)

#### T-42A TRAINING AIRCRAFT

(Engine and accessories, blade/propeller, airframe installation, structural repair, avionics)



# DEPOT LEVEL MAINTENANCE OF HELICOPTER / AIRCRAFT ENGINES

5<sup>th</sup> Main Maintenance Factory Directorate performs maintenance/repair and overhaul activities for airframe, engine and parts of aircraft/helicopters under its responsibility.

## TECHNOLOGICAL APPLICATIONS

- T53-L13B, T53-L703 Engines (Depot level with full capacity)
- T700-701A, T700-701C, T700-401 and T700-401C Engines
- 250-C20, 250-C20R4 Engines (Depot Level with full capability)
- T62T-40-1 (APU) Engines (Depot Level with full capability)
- PT6A-42, PT6T-3, -6, -9 Engines (Hot Section Inspection)
- Makila 1A1 Engines (Module Replacement, Periodical Maintenance Activities)
- Reciprocating Engines IO-360-D, IO-470-L, IO-520-H, GTSIO 520-H (Depot Level with full capability)
- Improved field level maintenance
- Hot section Inspection
- Power Turbine Drive Shaft Replacement
- Overhaul of GG Rotor Match Assy
- Overhaul of Accessory Gear Box
- Cold section maintenance and repair
- Overhaul of 1<sup>st</sup> Stage Nozzle Assy
- Depot Level Engine Test

## PRODUCT RANGE

■ PT6T  
TURBINE ENGINE



250-C20-B  
TURBINE ENGINE



MAKILA 1 ■  
TURBINE ENGINE



■ T700-401C  
TURBINE ENGINE



GTSIO-520-H  
RECIPROCATING ENGINE



T-53 SERIES ■  
TURBINE ENGINE



## DEPOT LEVEL MAINTENANCE OF HELICOPTER / AIRCRAFT ENGINES

5<sup>th</sup> Main Maintenance Factory Directorate performs maintenance/repair and overhaul activities for aircraft/helicopter engines under its responsibility.

### TURBINE ENGINE

#### ENGINE TYPE

T53-L13B  
 T53-L703  
 T700-701A  
 T700-701C  
 T700-401  
 T700-401C  
 250-C20,-C20 R4  
 T62T-40-1 (APU)  
 PT6T-3, -6, -9  
 PT6A-42  
 Makila 1A-1

#### AIRCRAFT IT BELONGS TO

UH-1H, AB205  
 AH-1P, UH-1H  
 S-70A-17  
 S-70A-28  
 AH-1W  
 S-70B  
 AB-206, OH-58  
 S-70A /B  
 AB-212, AB-412  
 B-200  
 AS-532

#### ENGINE TYPE

IO-360-D  
 IO-470-L  
 IO-520-H  
 GTSIO-520-H

#### AIRCRAFT IT BELONGS TO

T-41D  
 T-42A  
 U-17B  
 C-421B



## THE CONTROLLED ROOM

According to the international standards; reference, balance and test operations are applied to rotary system components of aircrafts/helicopters that are already and will be in the inventory such as CH-47, T-70, T-129, Gökbey in the controlled room (pressure, temperature and humidity balanced room).



Shaft, Engine components, Fan Test Stands of UH, AB, AS-532, S-70 Helicopters



Drive Shaft Test Stand of UH Helicopter



Drive Shaft Test Stand of T-129 Engine



Drive Shaft Test Stand of AS-532, S-70, Gökbey Helicopters



Grinding Room



Drive Shaft Test Stand of AS-532, S-70, Gökbey Helicopters



Shaft, Engine components, Fan Test Stands of UH, AB, AS-532, S-70 Helicopters

## DEPOT LEVEL MAINTENANCE FOR AVIONIC UNITS

It performs depot level maintenance, repair and overhaul activities for electro-mechanic and warning systems; depot level maintenance, repair and overhaul activities for communication systems; depot level maintenance and repair activities for available navigation systems; depot level maintenance and repair activities for available flight instruments of TAF aircraft.

It also performs maintenance, repair, overhaul and test activities for available 20 mm gun, M-65 tow missile systems, Helmet Sight System, TSU/NTS-LRF night vision binoculars and night aiming system, S-70 relay panels, laser pointers, mini UAVs night and day cameras.

### TECHNOLOGICAL APPLICATIONS

#### COMMUNICATION AND NAVIGATION SYSTEMS APPLICATIONS

- VHF/AM radios
- Mxf radios
- Intercom systems
- RPM systems
- Positioning systems
- IFF systems
- Autopilot systems
- Navigation systems
- Radar Altimeter
- INS Systems
- Mini UAV Ground Control Unit



Mini UAV Camera System  
Test Device



Anti-ice System Repair Test  
Stand



Instrument System Automatic  
Repair Test Stand



M-65 Tow Nts System Repair  
Test Stand



Atec-6 Repair Test Stand



Mxf-484 Radio  
Test Stand

## DEPOT LEVEL MAINTENANCE FOR AVIONIC UNITS

It provides technical supports for modification and modernization activities for aircraft/helicopters and acquires capabilities by manufacturing test devices under its responsibility fields and newly entered to inventory.

### TECHNOLOGICAL APPLICATIONS

#### WEAPON ELECTROOPTIC AND ELECTRO PROTECTION SYSTEMS APPLICATIONS

- M65 and Nts System
- 29 Mm Turret System
- Hss System
- Mini UAV Camera System
- Narcad System
- Afcs
- Cmsd
- Mws
- Ircm
- Glass cockpit system
- Hews
- Apr-39
- Bdi control system
- Engine control systems
- Warning and caution systems

#### SPECIAL TOOLS AND DEVICES

- Electrical and hydraulic cranes
- Linear actuators and servo
- Power electronic device
- Electronic warning and caution device
- AC/DC engines
- AC/DC starters and generators
- Electrical fuel pumps
- Pitot static systems
- Gyro systems
- Oil pressure and heat indicators
- Tachometer indicators
- Engine transmission indicators
- Pitot static test sets
- Accelerometer systems

CRANE REPAIR TEST STAND



GENERATOR REPAIR TEST STAND



LN-100G TEST STAND



VERTICAL GYRO REPAIR TEST STAND



## CALIBRATION ACTIVITIES

Our facility performs calibration of measurement devices belonging to electronic, mechanic and aviation systems under its responsibility in compliance with determined standards.

### MECHANICAL DEVICES

- Micrometers (inner/outer diameter etc.)
- Calipers
- Comparators
- Manometers
- Angle gauge, set-square
- Water balance
- Torque devices
- Balances, hand scale etc.
- Torque meter, tensiometer etc.

### ON-SITE CALIBRATED DEVICES

- Trim actuator test device
- Schenck balance test device
- Bearing measurement test device
- Mets (turbine engine test bench)
- Starter generator Test Device
- Image console (hydraulic test stand)
- Torque test device
- Altimeter Measurement Device
- Blade balance scales

### ELECTRONIC AND AVIATION DEVICES

- Vibrex
- Jetcall
- Stabilator SAS
- APU-ESU
- Ecu Box
- Inspection Box
- ITSGMS
- VIDS-LINE Test Set
- Balance kits
- Multimeter
- Thermometers (Heat indicators etc.)

### TORQUEMETER



### PRESSURE MEASURING DEVICES



### TEMPERATURE MEASURING DEVICES CALIBRATION



### MULTIMETER



# NONDESTRUCTIVE INSPECTION ACTIVITIES

Nondestructive inspection division performs NDI activities for parts and accessories of military and commercial air platforms systems/components in its shops or in customer facilities with its mobile teams having portable devices.

Nondestructive inspection activities are performed by competent staff qualified and certified at level 2 in compliance with TS EN 4179 / NAS 410 standards.

Our factory directorate has the approval certificate awarded by Civil Aviation General Directorate for the belowmentioned nondestructive inspection methods within the scope of SHY-145 and it also a member of National Aviation Nondestructive Inspection Committee.

## TECHNOLOGICAL APPLICATIONS

1. Fluid penetrant control management (PT)
2. Magnetic particle control management (MT)
3. Eddy current control management (ET)
  - a. Conventional techniques
  - b. Digital conductivity measurement technique
4. Ultrasonic control management (UT)
  - a. Conventional techniques
  - b. Improved ultrasonic phased array technique
  - c. Bond test technique
5. Radiographic (X-Ray) control method (RT)
  - a. Radiography technique
  - b. Radioscopy technique

**RADIOGRAPHIC (X-RAY) CONTROL METHOD (RT)**



**ULTRASONIC CONTROL MANAGEMENT (UT)**



**IMPROVED ULTRASONIC PHASED ARRAY**



**EDDY CURRENT CONTROL MANAGEMENT (ET)**



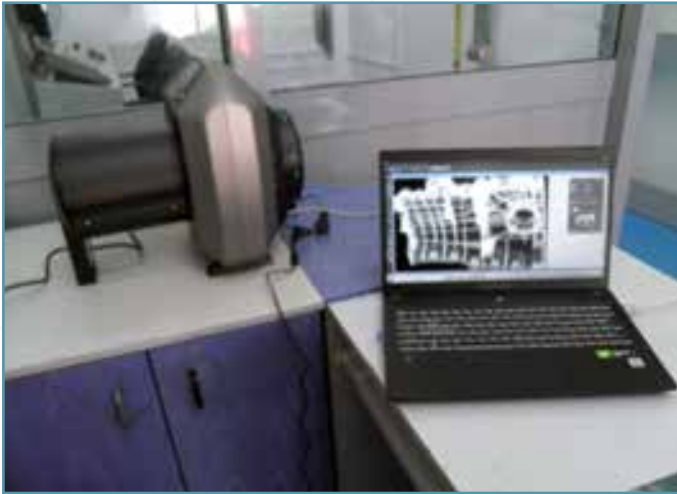
**BOND TEST TECHNIQUE**



## NONDESTRUCTIVE INSPECTION ACTIVITIES

X-Ray films that show the inner structure of the materials are transferred to the digital media by using a scanner technique and a special software program. Detailed inspection and evaluation are performed to the software datas. The digital radiographic film technique has some advantages on the traditional one such as; time-savings and more accurate data and images are obtained.

### DIGITAL RADIOGRAPHIC SYSTEM



### PORTABLE X-RAY DEVICE CONTROL UNIT



PORTABLE X-RAY DEVICE

PORTABLE X-RAY DEVICE  
CONTROL UNIT

# NONDESTRUCTIVE INSPECTION ACTIVITIES

## FLUORESCENT PENETRANT CONTROL MANAGEMENT

With the aim of determining the surface discontinuities parts immersed into a chemical named fluorescent penetrant are controlled in a dark environment with black light (UV-A) after other chemicals are applied to them. All parts such as nonferrous, nonmagnetic, stainless steel, ceramic and glass are controlled.

## MAGNETIC PARTICLE CONTROL MANAGEMENT

With the aim of determining surface and nearsurface discontinuities, it is aimed at creating a magnetic field around the part after the current is applied to the part or the part is exposed to magnetic field and occurring flux loss is controlled in a dark environment with black light in compliance with flux loss principle. All kinds of ferromagnetic parts are controlled.

## EDDYCURRENT CONTROL MANAGEMENT

With the aim of determining surface and near surface discontinuities systems including special electronic devices and accessories and reference standards are used. Furthermore parts electrical conductivity values, heat treatment conditions, conductive/ nonconductive coating thickness are determined. All kinds of parts having electrical conductivity are controlled.

## ULTRASONIC INSPECTION METHOD

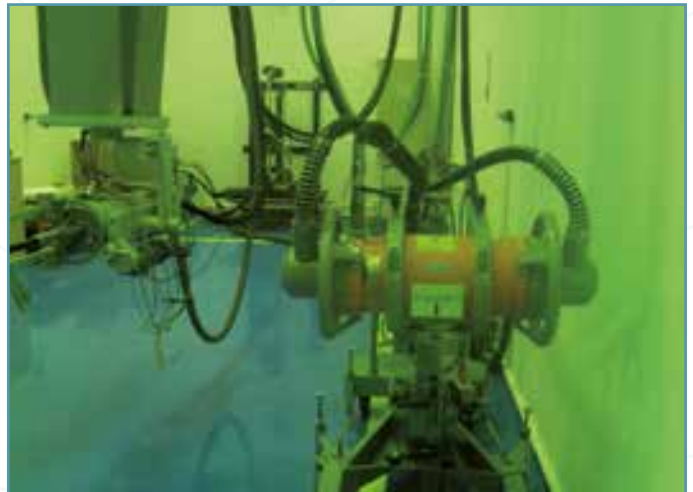
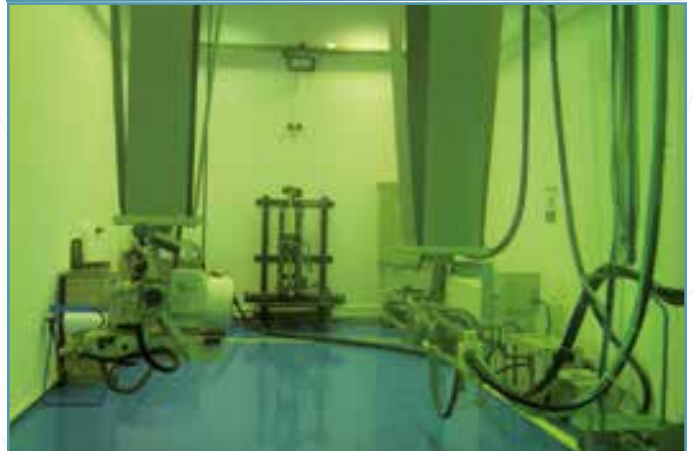
Special electronic device instrument systems and reference standards are used to detect discontinuities of inner structure of the parts. Also, error and corrosion map can be created by using advanced ultrasonic phased array technique. All parts that have metal and composite structures can be inspected.

## RADIOGRAPHIC (X-RAY) INSPECTION METHOD

X-Ray devices that have special 160/320 kV X-Ray tubes (real time X-Ray system) and 450 kV X-Ray tubes with their accessories are used to detect discontinuities of inner structure of the materials. X-Ray films can be taken by using the radiography technique and the inner structure inspection of parts can be carried out by using radioscopy technique in the digital media, monitors. Composite structures and metal parts that have a specific thickness (9 cm for steel alloys, 20 cm for aluminum alloys are limited) can be inspected.

In our workshop, all radiation protection measures which take place in the legislation are provided and licensed by Turkish Atomic Energy Authority.

### RADIOGRAPHIC (X-RAY) INSPECTION METHOD (RT)



### FLUORESCENT PENETRANT INSPECTION MANAGEMENT (PT)



## MANUFACTURING ACTIVITIES

5<sup>th</sup> Main Maintenance Factory Directorate performs manufacturing, repair and maintenance activities for structural parts, spare parts and special tools of aircraft, helicopters, air and ground units and accessories under its responsibility.

### TECHNOLOGICAL ACTIVITIES

#### MANUFACTURING CAPABILITY

- Manufacture and test for variously diametered rubber and teflon based aircraft hose
- Manufacture and test for aluminum and stainless steel aircraft oil, fuel and hydraulic pipes up to 1 inch
- Machining of metal based materials
- Special tools manufacturing
- Test device manufacturing
- Harness manufacturing and continuity test
- Metal plate forming and manufacturing
- Aluminium and stainless steel welding
- Composite material manufacturing
- Flight control cable manufacturing
- Various saddler materials manufacturing
- Carpenter materials manufacturing
- Serigraphy and printing manufacturing

#### BENCHES

- CNC horizontal machining center with 5 axis
- CNC verticle turning
- CNC turning with C axis
- CNC vertical machining center with 3 axis
- Erosion and wire erosion
- CNC cylindrical grinding
- Pantograph
- Shot peening activity
- Cutting machine with laser
- Bending bench
- Mold bench (mechanical press)

#### GRINDING MANUFACTURE WORKSHOP



#### CNC HORIZONTAL MACHINING CENTER WITH 5-AXIS



#### COMPOSITE MATERIAL MANUFACTURING



#### CNC VERTICLE TURNING



#### CYLINDRICAL GRINDING





# 3D STRUCTURAL DESIGN

High speed camera applications are used to shoot 70.000 film frames of aircraft and parts in one second.

Solid models are scanned by using 3D optical scanner.

Temperature changes of aircraft/helicopters and parts can be measured by using Thermal Camera.

■ HIGH SPEED CAMERA



THERMAL CAMERA ■



■ 3D OPTICAL SCANNER



3D OPTICAL SCANNER ■



## GENERAL VIEW OF 3D STRUCTURAL DESIGN OFFICE



## QUALITY MANAGEMENT ACTIVITIES

It carries out the depot level maintenance, repair, overhaul and technical management responsibility for the helicopters/aircraft within the scope of the protocols signed.

### LABORATORY ACTIVITIES

Various chemical and physical tests and experiments are made in the laboratory in order to ensure safety flights of air platforms and to make the required analysis.

### PERIODICAL OIL ANALYSIS PROGRAM

- Spectrometrical oil analysis
- Ferrograph analysis
- Hydraulic contamination analysis
- Water content determination

### CHEMICAL ANALYSIS

- Coating solutions analysis
- Shelf life extension tests

### METALLOGRAPHY TESTS

- Hardness and micro-hardness measurements
- Metallographic examinations



# DESTRUCTIVE INSPECTION AND DAMAGE ANALYSIS ACTIVITIES

In the 5<sup>th</sup> Main Maintenance Factory Directorate, destructive inspection and damage analysis workshop applications are;

- Hardness measurements (HBN, HRC, HRA, HRB, Vickers, Knoop)
- Strength Test (Tension, compression and bending tests at ambient temperature and high temperatures)
- Material chemical analysis (optical emission spectrometer)
- Metallographic specimen preparation
- Macrostructure and microstructure inspection with digital microscope
- Structural analysis and viewing (Digital microscope, SEM) operations can be performed.

10 T AND 20 T CAPACITY TENSION/COMPRESSION TEST STAND



UNIVERSAL HARDNESS MEASUREMENT DEVICE



METALLOGRAPHIC SPECIMEN PREPARATION DEVICES



ELECTRON MICROSCOPE (SEM)



DIGITAL MICROSCOPE DEVICE



OPTICAL EMISSION SPECTROMETER DEVICE



## CERTIFICATES

### SHY-145

APPROVED MAINTENANCE ORGANIZATION CERTIFICATE

### AQOP-2310

NATO QUALITY ASSURANCE REQUIREMENTS FOR AVIATION, SPACE AND DEFENCE SUPPLIERS

### AQAP-2110

NATO QUALITY ASSURANCE REQUIREMENTS FOR DESIGN, DEVELOPMENT AND MANUFACTURING

### ISO 45001

OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT SYSTEM





# SEWING & TAILORING SHOP DIRECTORATES







# ARMY SEWING & TAILORING SHOP DIRECTORATE

## DAILY UNIFORM FOR OFFICERS

- Material type %66 wool with the tolerance of  $\pm 3$ , %2 elastane with the tolerance of  $\pm 1$ , the rest parts contain polyamide.
- The weight of the fabric per square meter is  $205 \pm 10 \text{ g/m}^2$ .
- The type of collar is the male collar with notch lapel, thermofusible interlining is glued to the bottom surface of the upper layer fabric and its lower layer is sewn from the felt fabric.
- The front part has one – piece and its buttons are opened and closed from the front side, 4 large gold-plated buttons are used.
- The right and left front parts are fully covered with thermofusible interlining and facings are sewn to its interior part. Facings are completely covered with the thermofusible interlining.
- One inner pocket is sewn to each inner parts of the breast of the right and left front parts of the jacket.



- The inside part of the jacket is fully lined.
- On the front part there are two flap pockets on the top right and on the left side which have one bellow in their middle parts.
- There are two pockets on the upper front right part and on the upper front the left part. These are ornamental flap pockets. The jacket has 1 small button on the pocket flap.
- Trousers are straight leg. There is one dart on the front parts and back part.
- There are one side pocket on the both sides of the trousers.
- At the back part of trousers there are one welt pocket on each side.
- The waist part of the trousers are belted. The interior part is sewn with belt liner and there are 7 loops on the belt.
- Sizes 40-42-44-46-48-50-52-54-56-58-60-62, Drops A-B-C-D



## KHAKI COAT

- The material type is %80 wool with the tolerance of  $\pm 3$  and %20 Polyamide.
- The weight of the fabric per square meter is  $340 \pm 10 \text{ g/m}^2$
- The inside of the coat is fully lined, including the sleeves.
- Its collar type is a male collar with notch lapel and thermofusible interlining is attached to the lower surface of the upper fabric. Its bottom ply is sewn from felt fabric.
- The front parts has one piece. There are 3 oversized buttons to open and close the coat from the front side.
- There are 3 pieces of eyes buttonhole, these buttonholes match with the buttons. The eye part of the buttonhole is on the front side of the coat.
- Right and left front parts are fully covered with thermofusible interlining and a facing at least having the width of 7,5 cm is sewn to the interior part and the facings are completely covered with thermofusible interlining.
- There are one welt pocket on the right and left front side. The welt piece and the cloth piece opposite to it are glued with thermofusible interlining to the coat fabric.
- On the side of the coat, from the point where the collar and shoulder part overlap, there is a hair interlining with a length of at least 35 cm. This hair interlining is stitched to the shoulder, armhole and facing.
- One inner pocket is sewn to the side of the breast of the right and left front part of the coat.
- Coat sleeves have two-pieces as lower and upper sleeves and one sleeve latch is sewn to both sleeves' lower parts. The latch is sewn to the sleeve with a small button from the end part.
- Shoulder pads are sewn under the shoulder parts.
- Sizes 44-46-48-50-52-54-56-58-60-62, Drops A-B-C-D



## KHAKI JACKET

- The material type is %50 wool with the tolerance of  $\pm 2$  and %50 Polyester.
- The weight of the fabric per square meter is 280 (-10+20) g/m<sup>2</sup>.
- The collar type of the jacket is spread collar.
- The front piece of the jacket has a front closure part. There is a pipe on the front closure part seam.
- There are one side pocket on the both right and left front parts.
- There is a zipper in front of the jacket.
- Front part of the jacket has plackets. There are 4 snaps on the front placket.
- The back part of the jacket has a yoke.
- The jacket sleeves has two pieces.
- The inner part of the jacket is quilted with zipper.
- Sizes 40-42-44-46-48-50-52-54-56-58-60-62, Drops A-B-C-D



## VEST KHAKI (OFFICER AND NCO)

- Material type is %66 wool with the tolerance of  $\pm 3$ , %2 elastane with the tolerance  $\pm 1$ , the rest contains polyamide.
- The weight of the fabric per square meter is  $205 \pm 10$  g/m<sup>2</sup>.
- The back part of the vest is flat and has one-piece. Its front parts are 2 cm longer than the side parts.
- Right and left front parts are covered with thermofusible interlining and facing at least with the width of 3,5 cm is sewn to the inner front parts of the vest. The facing is completely covered with thermofusible interlining.
- On the right and left lower front parts there are one welt pocket. On the left upper front part there is one welt pocket. The welt piece and the cloth piece opposite to it are glued with thermofusible interlining to the vest fabric.
- On each front part of the vest there is a dart from the bottom up.
- The inside part of the vest is fully polyester lined.
- Sizes 44-46-48-50-52-54-56-58-60-62, Drops A-B-C-D



## CAMOUFLAGE COMBAT UNIFORM

- The material type is %65 cotton with the tolerance  $\pm 3$ . The rest is a mixed yarn with a polyester fiber inside.
- The fabric per meter square weight is 220-235 g/m<sup>2</sup>.
- The jacket collar is foldable and it is sewn from double layers of fabric. Thermofusible interlining is attached to the upper layer of the collar.
- Double welt pocket is sewn to the right and left front parts of the jacket. These pockets are zippered.
- The left front part of the jacket has a hidden placket, there are 5 button holes on the placket. The front part of the jacket has buttons that match those button holes.
- The back part of the jacket has half-bellows. Bellows depth is at least 3 cm. There are 3 eyelets in the back part bellows, on the sleeve 2 eyelets, front part 1 eyelet, back part 1 eyelet (on the right 7 eyelets and on the left 7 eyelets in total) and totally there are 14 eyelets.
- Jacket sleeve has 2 pieces, has a slit and sleeve vent, two buttons are sewn to the end of the sleeve cuff. Thermofusible interlining is attached to the upper layer of the sleeve cuff.
- Sleeve patch is sewn to the right and left sleeves. There are pockets on the sleeves.
- For officers, zipper having the length of 30 cm is sewn to the right side of the bottom part of the jacket.
- Sizes 45-48-51-54-57-60-63, Drops A-B-C-D



## TROUSERS

- The trousers have a knee patch on the front part.
- On both sides of the trousers flap pockets with a bellow are sewn on the side seams.
- There's hidden placket on the front part of the trousers. There are four buttons.
- There are side pockets on both sides of the trousers.
- The lower end and upper end of the pocket entry are reinforced with reinforcement stitching.
- There are 2 single welted flap pockets at the back of the trousers.
- On the right leg of the trousers, 1 cm below the knee patch, there is a trouser cuff pocket.
- The trouser belt is sewn from lining fabric with the width of 5-6 cm.
- There are a total of 7 belt loops over the belt. The upper and lowers ends of the loops are reinforced with reinforcement seam.
- A patch piece is sewn to the back of the trousers.
- A rubber rope is inserted into the turn up part of the trousers legs and a double-eye stopper is attached to end of that ropes of the trousers.
- Sizes 45-48-51-54-57-60-63, Drops A-B-C-D



## HAT

- The hat consists of 6 parts. These parts are 4 side parts and rear parts, front part, front peak.
- The peak is covered with dress fabric. On the peak, topstitch is made from a distance of 1.5-2 cm.
- The front part of the hat is covered with support material. At the top of the front part, there is a suture of dart seam.
- A sweat band is sewn around the inside part of the hat.
- A sweat band is sewn to the back part of the hat and a touch and close fastener is sewn between the hat fabric, which is placed so that the female part is on the left side and which is placed so that the male part is on the right side.



## WIND JACKET TRAINING DRESS (BATTLE DRESS UNIFORM)

- Material type is 65% cotton fiber with the tolerance of  $\pm 3$ . The rest is blended yarn, which is polyester fiber.
- The weight of the fabric per square meter is 220-235 g/m<sup>2</sup>.
- The collar of the jacket has an internal mounted hood. The inside part of the hood is lined. A rubber rope is passed through the tunnel seam on the sides of the hood. A stopper is attached to the rope end.
- The jacket collar is sewn from double layers of fabric. Lining is sewn inside the top layer of the collar. There is a hidden zipper for the hood.
- On the right and left front sides of the jacket there is a zippered pocket. There are two zippered pockets.
- The coat has a yoke on the right and left front parts and back shoulder parts of it.
- The front part of the jacket is zipped from the bottom part to the end of the collar.
- The Jacket sleeve has 3 pieces. There are double darts. The cuff is flat. One sleeve latch is attached to the end of the each sleeve. A female snap is attached to the tip of the latch. Opposite to it there is a male snap.
- There is a zippered slot pocket on the right and left sleeves.
- A rubber rope is passed through the tunnel seam at the end of the bottom part. A stopper is placed to the end of this rubber rope.
- The inside part of the jacket, body part and sleeve part are lined.
- Disassembled fleece is available inside the jacket.
- There are welt pockets on the right and left front parts of the fleece.
- The collar and shoulder parts are made of jacket fabric, up to the end of the sleeve hem.
- The front part of the fleece is zipped from the bottom part to the end of the collar.
- The inside part of the fleece, body part and sleeve part are lined.
- Sizes 45-48-51-54-57-60-63  
Drops A-B-C-D



## SHIRT FOR OFFICERS

- Material type is 49% viskon, %49 PES and %2 elastane
- The weight of the fabric per square meter is 150 g/m<sup>2</sup>.
- There are 7 buttons on the front side of the shirt. A spare button is sewn on the inner front part of the shirt. This spare button is hidden.
- There are 2 flap pockets on the front side of shirt.
- The back part of the shirt is yoked from the shoulder.
- Shirt has a straight collar. The shirts have one-layer sanforised interlining on the collars, collar ends, cuffs and flaps.
- Front and back bottom parts of the shirt are oval-cut.
- Shirt sleeve has 1 piece, has a cuff and sleeve trimming, two buttons are sewn to the end of the sleeve cuff and one button is sewn to the trimming.
- There are XS-S-M-L-XL-XXL body sizes



## SHIRT FOR SUMMER

- Material type is 49% viskon, %49 PES and %2 elastane
- The weight of the fabric per square meter is 150 g/m<sup>2</sup>.
- There are 5 gold-plated buttons on the front side of the shirt. There is one plastic button is sewn to the front side of the shirt.
- There are 2 patch pockets on the front side of the shirt.
- The back part of the shirt is yoked.
- Shirt has a reverse collar. There is one-layer sanforised interlining between the two layers of shirt cloth.
- Shirt sleeves are one piece and straight.
- There are XS-S-M-L-XL-XXL body sizes and A-B-C-D drops.





## SHIRT FOR SUMMER, WOMEN

- Material type is 49% viscose, 49% polyester and 2% elastane.
- The weight of the fabric per square meter is 150 g/m<sup>2</sup>.
- There are 5 gold-plated buttons on the front side of the shirt.
- There are 2 patch pockets on the front side of the shirt.
- The shirt has a chest dart on the front and a back width dart on the back.
- The back part of the shirt is yoked.
- The shirt has a reverse collar.
- The sleeves are one piece and straight.
- Sizes XS-S-M-L-XL-XXL,  
Drops A-B-C-D



## SHIRT, WAITER, WHITE

- Material type is 67% polyester and 33% cotton.
- The weight of the fabric per square meter is 130 g/m<sup>2</sup>.
- There are 7 plastic buttons on the front side of the shirt.
- There is a pocket on the left front side of the shirt.
- The back part of the shirt is yoked.
- The shirt has a straight collar.
- The sleeves are one piece with cuff.
- Sizes 46-48-50-52-54-56-58,  
Drops A-B-C



## SHIRT, CAMOUFLAGED, SUMMER

- Material type is mixed yarn %65 cotton, the rest is polyester fiber inside.
- The weight of the fabric per square meter is 150 g/m<sup>2</sup>.
- The fabric's pattern is 2/2 twill.
- There are 6 plastic buttons on the front side of the shirt.
- There are 2 flap pockets on the front side of the shirt.
- The back part of the shirt is yoked.
- The shirt has a reverse collar.
- The sleeves are one piece and straight.
- Sizes XS, S, M, L, XL, XXL,  
Drops A-B-C-D



## VEST, KHAKI, WOMEN

- Material type is % 66 wool, % 2 elastane and the rest contains polyamide.
- The weight of the fabric per square meter is 205 g/m<sup>2</sup>.
- The fabric's pattern is 2/1 twill.
- There are 5 plastic buttons on the front side of the vest.
- The inside part of the vest is fully khaki polyester lined.
- The front part has 2 welt pockets with a flap.
- Sizes 38-40-42-44-46-48-50-52-54-56,  
Drops A-B-C-D



## SERVICE DRESS, WOMEN

- Material type is 66% wool with the tolerance of  $\pm 3$ , 2% elastane with the tolerance of  $\pm 1$ , the rest parts contain polyamide.
- The weight of the fabric per square meter is 205  $\pm 10$  g/m<sup>2</sup>.
- The type of collar is the male collar with notch lapel.
- The front part has 4 large moon-star embroidered gold-plated buttons.
- There are 2 small moon-star embroidered gold-plated buttons on epaulets and 2 side pockets.
- The front size of the jacket has 2 decorative pockets with a flap.
- The back body is flat.
- The inside of the jacket is fully polyester lined.
- Trousers are straight leg and have a dart on its back part.
- There are one side pocket on both sides of the trousers.
- The trousers include a waistband.
- The skirt has 2 darts from the front and back.
- Zippered and buttoned from the back.
- The back body has a slit.
- The inside of the skirt is fully polyester lined.
- The skirt includes a waistband.
- Sizes 38-40-42-44-46-48-50-52-54-56-58, Drops A-B-C-D



## KHAKI, COAT, WOMEN

- Material type is %50 wool and %50 polyester.
- The weight of the fabric per square meter is 280 g/m<sup>2</sup>.
- The collar type of the coat is spread collar.
- The front piece of the coat has a front closure part. There is a pipe on the front closure part seam.
- There are 2 side pockets on the front parts.
- There is a zipper in front of the coat.
- Front part of the coat have 4 snaps.
- The back part of the coat has a yoke.
- The inner part of the coat is quilted.
- The inside of the coat is fully lined with khaki polyester.
- Sizes 38-40-42-44-46-48-50-52-54-56, Drops A-B-C-D



## KHAKI, WOMEN, SURCOAT

- Material type is %50 wool and %50 polyester.
- The weight of the fabric per square meter is 280 g/m<sup>2</sup>.
- The back body has a slit.
- There are 2 flap pockets on the sides of the surcoat.
- The front part has 6 large plastic buttons.
- There are 3 small size plastic buttons, 1 button on the collar and 2 buttons on the sleeves.
- It includes a belt on the waist part.
- The inside of the surcoat is fully polyester lined.
- Above the waist part it is quilted.
- There is a sleeve latch at each cuff.



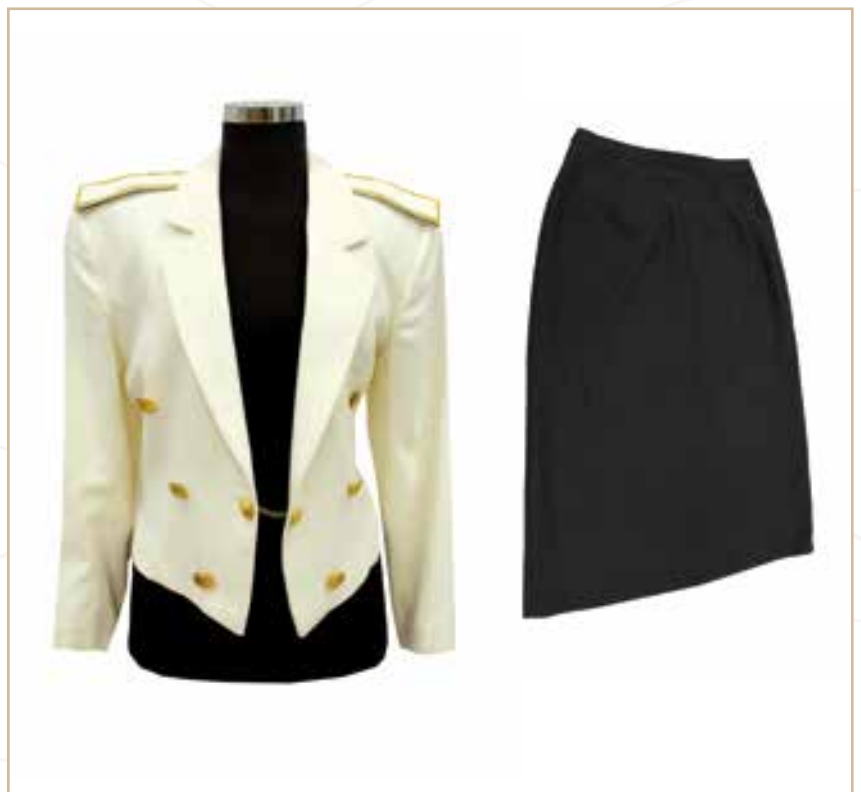
## DRESS, MESDRESS, WHITE

- The dress consists of a jacket and trousers.
- Material type is %60 wool, tolerance  $\pm 5$  and the rest contains polyester.
- The weight of the fabric per square meter is  $220 \pm 10$  g/m<sup>2</sup>.
- The inside of the jacket is fully polyester lined.
- There are 6 gold-plated buttons on the front side of the jacket.
- The collar of the jacket is a swallow collar.
- The trousers have a red stripe on the both sides.
- Sizes 44-46-48-50-52-54-56-58, Drops A-B-C-D-E-F-G-H



## DRESS, MESDRESS, WHITE, WOMEN

- The dress consists of a jacket and skirt.
- Material type is %60 wool, tolerance  $\pm 5$  and the rest contains polyester.
- The weight of the fabric per square meter is  $220 \pm 10$  g/m<sup>2</sup>.
- The inside of the jacket is fully polyester lined.
- There are 6 gold-plated buttons on the front side of the jacket.
- The collar of the jacket is a swallow collar.
- The skirt has a back slit.
- Sizes 40-42-44-46-48-50-52-54-56, Drops A-B-C-D-E-F-G-H



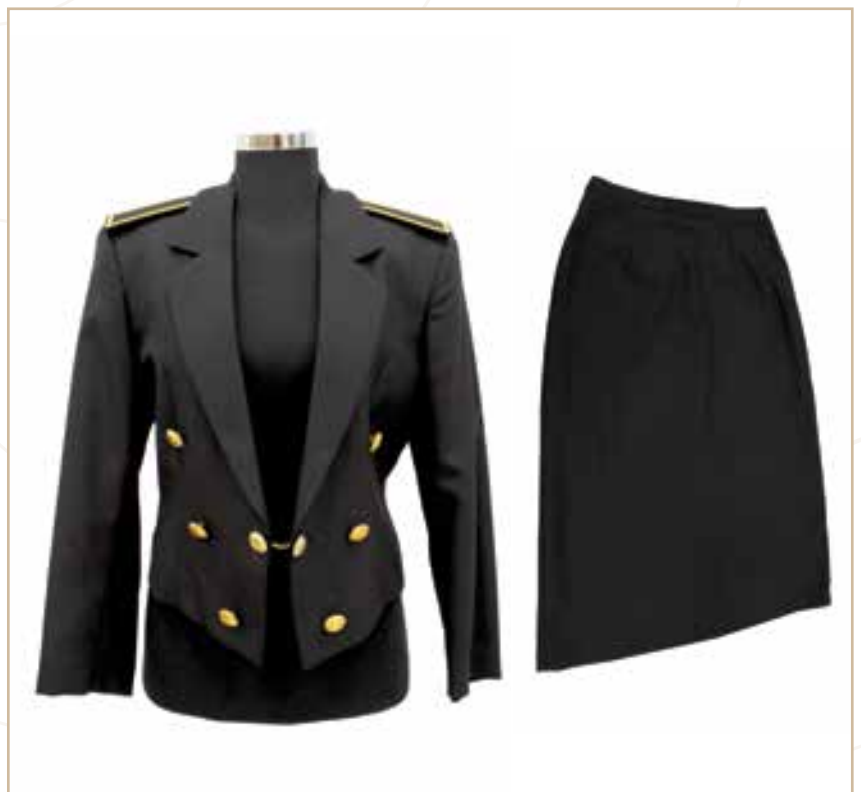
## DRESS, MESDRESS, BLACK

- The dress consists of a jacket and trousers.
- Material type is %60 wool, tolerance  $\pm 5$  and the rest contains polyester.
- The weight of the fabric per square meter is  $220 \pm 10$  g/m<sup>2</sup>.
- The inside of the jacket is fully polyester lined.
- There are 6 gold-plated buttons on the front side of the jacket.
- The collar of the jacket is a swallow collar.
- The trousers have a yellow stripe on the both sides.
- Sizes 44-46-48-50-52-54-56-58, Drops A-B-C-D-E-F-G-H



## DRESS, MESDRESS, BLACK, WOMEN

- The dress consists of a jacket and skirt.
- Material type is %60 wool, tolerance  $\pm 5$  and the rest contains polyester.
- The weight of the fabric per square meter is  $220 \pm 10$  g/m<sup>2</sup>.
- The inside of the jacket is fully polyester lined.
- There are 6 gold-plated buttons on the front side of the jacket.
- The collar of the jacket is a swallow collar.
- The skirt has a back slit.
- Sizes 40-42-44-46-48-50-52-54-56, Drops A-B-C-D-E-F-G-H



## DRESS, FULL DRESS SUIT, BLACK AND WHITE, WITH A VEST

- The dress consists of a jacket, trousers, a vest and a cummerband.
- Material type is %60 wool, tolerance  $\pm 5$  and the rest contains polyester.
- The weight of the fabric per square meter is  $220 \pm 10$  g/m<sup>2</sup>.
- The inside part of the jacket is fully polyester lined.
- The collar of the jacket is a swallow collar, the top of the collar is covered with satin.
- There are 6 fabric covered buttons on the front side of the jacket.
- The back body has a slit and has a longer hem than the front part.
- There are side pockets on the both sides of the trousers.
- The front part of the trousers is pleated.
- The collar of the vest is a shawl collar.
- The inside and back part of the vest are white polyester lining.
- There are 3 plastic buttons on the front side of the vest.
- There is a welt pocket on the both front parts of the vest.
- Behind the vest, there is a belt made of lining fabric.
- The cummerband is black satin.
- Sizes 44-46-48-50-52-54-56-58,  
Drops A-B-C-D-E-F-G-H



## DRESS, HARMONICA BAND, KHAKI, SEASONAL

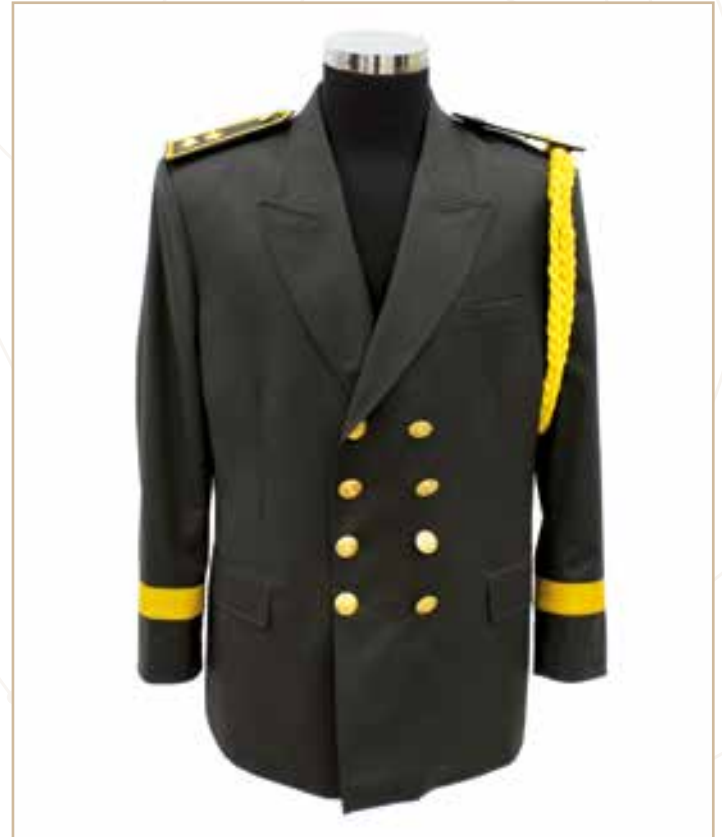
- The dress consists of a jacket and trousers.
- Material type is % 66 wool, % 2 elastane and the rest contains polyamide.
- The fabric's pattern is 2/1 twill.
- The weight of the fabric is  $205 \pm 10$  g/m<sup>2</sup>.
- The collar is a double-breasted collar.
- There is a breast pocket on the left side of the jacket.
- On the both front sides of the jacket, there are welt pockets with a flap.
- The jacket has silvery yellow stripe on the right and left sleeves.
- The left side of the jacket and the left arm has a lyre figure embroidery.
- There are 8 Moon-Star embroidered gold-plated buttons.
- Around the epaulette there is a silvery yellow stripe and both epaulettes have a Moon-Star embroidered gold-plated button.
- The jacket has 2 yellow gold ribbons on the left shoulder.
- The back body has a slit.
- The inside part of the jacket is fully %100 khaki polyester lined.
- There are side pockets on both sides of the trousers.
- The trousers have a silvery yellow stripe on the both sides.
- Sizes 40-42-44-46-48-50-52-54-56,  
Drops A-B-C-D-E-F-G-H.





## DRESS, MARCHING BAND, CEREMONIAL, KHAKI, SEASONAL

- The dress consists of a jacket and trousers.
- Material type is % 66 wool, % 2 elastane and the rest contains polyamide.
- The fabric's pattern is 2/1 twill.
- The weight of the fabric per square meter is  $205 \pm 10 \text{ g/m}^2$ .
- The collar is a double-breasted collar.
- There is a breast pocket on the left side of the jacket.
- There are welt pockets on the both front sides of the jacket.
- The jacket has a silvery yellow stripe on the right and left sleeves.
- There are 8 Moon-Star embroidered gold-plated yellow buttons.
- Around the epaulette there is a silvery yellow stripe and both epaulettes have 1 Moon-Star embroidered gold-plated yellow button.
- The jacket has 2 yellow gold ribbons on the left shoulder.
- The back body has a slit.
- The inside part of the jacket is fully %100 khaki polyester lined.
- There are side pockets on both sides of the trousers.
- The trousers has a silvery yellow stripe on the both sides.
- Sizes 40-42-44-46-48-50-52-54-56,  
Drops A-B-C-D-E-F-G-H



## DRESS, MARCHING BAND, DAILY, SEASONAL

- Material type of the shirt is 49% viscose, 49% polyester and 2% elastane.
- The weight of the fabric per square meter is 150 g/m<sup>2</sup>.
- There are 4 gold-plated buttons on the front of the shirts.
- There are 2 flap pockets on the front side of the shirt.
- The back part of the shirt is yoked.
- The shirt has a reverse collar.
- The sleeves of the shirts are one-piece and straight.
- The shirt has 2 yellow gold ribbons on the left shoulder.
- Around the epaulette, there is a silvery yellow stripe and both epaulettes have 1 Moon-Star embroidered gold-plated button.
- Material type of the trousers is % 66 wool, % 2 elastane and the rest contains polyamide.
- There are side pockets on both sides of the trousers.
- There are 2 flap welt pockets on the back part of the trousers.
- The trousers have a silvery yellow stripe on the both sides.
- Sizes 44-46-48-50-52-54-56-58-60, Drops A-B-C-D-E-F-G-H



## CLOAK, MARCHING BAND AND HARMONICA BAND

- Material type is % 66 wool, % 2 elastane and the rest contains polyamide.
- The weight of the fabric per square meter is 205±10 g/m<sup>2</sup>.
- The fabric's pattern is 2/1 twill.
- There are 4 plastic buttons on the front side of the cloak.
- There is an embroidery yellow silvery lyre figure on the left front side of the cloak.
- The inside part of the cloak is fully lined with khaki polyester.
- Inside the cloak there is a zipper inner lining made of wool fabric.
- The collar of the cloak is surrounded by a yellow stripe.



## DRESS, BAND JACKET, TURQUOISE TROUSERS, NAVY BLUE JACKET

- The dress consists of a jacket and trousers.
- Material type is %60 wool, tolerance  $\pm 5$  and the rest contains polyester.
- The weight of the fabric per square meter is  $220 \pm 10$  g/m<sup>2</sup>.
- The collar is a double-breasted collar.
- There is a breast pocket on the left side of the jacket.
- On the both front sides of the jacket, there are welt pockets with a flap.
- The jacket has a white stripe on the right and left sleeves.
- There are 8 Moon-Star embroidered gold-plated yellow buttons.
- Around the epaulette there is a silvery yellow stripe and both epaulettes have 1 Moon-Star embroidered gold-plated yellow button.
- The jacket has 2 white stripe ribbons on the left shoulder.
- The back body has a slit.
- The inside part of the jacket is fully blue polyester lined.
- There are side pockets on both sides of the trousers.
- The trousers has a white stripe on the both sides.
- Sizes 40-42-44-46-48-50-52-54-56-60, Drops A-B-C-D-E-F-G-H



## DRESS, PRESIDENTIAL GUARD REGIMENT, JACKET TURQUOISE, TROUSERS NAVY BLUE, WINTER

- The dress consists of a jacket and trousers.
- Material type is %60 wool, tolerance  $\pm 5$  and the rest contains polyester.
- The weight of the fabric per square meter is  $220 \pm 10$  g/m<sup>2</sup>.
- The collar type is the mandarin collar.
- The edge of the collar is covered by a yellow silver stripe.
- There are 4 Moon-Star embroidered gold-plated buttons on the front of the jacket.
- The front body is embroidered with a white stripe.
- There is yellow silver embroidery on the epaulette.
- The jacket has 3 rows of white braid on the right shoulder and at the tip there is a metal tube.
- The back body has a slit.
- The inside part of the jacket is fully blue polyester lined.
- There are side pockets on both sides of the trousers.
- The trousers has a white stripe on the both sides.
- Sizes 44-46-48-50-52-54-56-58-60,  
Drops A-B-C-D-E-F-G-H



## CLOAK, PRESIDENTIAL GUARD REGIMENT, MARCHING BAND TURQUOISE

- Material type is %60 wool, tolerance  $\pm 5$  and the rest contains polyester.
- The weight of the fabric per square meter is  $220 \pm 10$  g/m<sup>2</sup>.
- There are 4 plastic buttons on the front side of the cloak.
- There is an embroidery white lyre figure on the left front side of the cloak.
- The inside part of the cloak is fully lined with blue polyester.
- Inside the cloak there is a zipper inner lining made of wool fabric.
- The collar of the cloak is surrounded by a white stripe.



## OVERCOAT, PRESIDENTIAL GUARD REGIMENT

- The material type is %85 wool and %15 polyester
- The weight of the fabric per square meter is  $540 \pm 10$  g/m<sup>2</sup>.
- The inside part of the overcoat is fully lined with blue polyester.
- There are 6 flat yellow gold-plated buttons on the front side of the overcoat.
- The back body has a slit.
- The front body is embroidered with a white stripe.
- The jacket has 3 rows of white braid on the right shoulder.
- Sizes 45-48-51-54-57,  
Drops A-B-C-D



## DRESS, HONOUR/CEREMONIAL GUARD

- The dress consists of a jacket, trousers and a scarf.
- Material type is % 66 wool, % 2 elastane and the rest contains polyamide.
- The fabric's pattern is 2/1 twill.
- The weight of the fabric per square meter is  $205 \pm 10 \text{ g/m}^2$ .
- The collar type of the jacket is spread collar.
- There are 5 plastic buttons on the front side of the jacket.
- There are 2 flap pockets on the chest part and 2 flap pockets on the waist part of the jacket.
- There is a pen pocket on the left sleeve.
- The inside part of the jacket is fully %100 khaki polyester lined.
- The jacket has a khaki ribbon on the right shoulder.
- There are side pockets on both sides of the trousers.
- There are 2 flap welt pockets on the back of the trousers.
- A rubber rope is inserted into the turn up part of the trouser legs.
- The scarf is made of lining fabric.
- Sizes 45-48-51-54-57,  
Drops A-B-C-D-E-F-G-H



## CAMOUFLAGE, COMBAT UNIFORM, DESERT TYPE

- Material type is % 50 cotton and %50 polyester.
- The weight of the fabric per square meter is 215 g/m<sup>2</sup>.
- It has a reverse collar.
- The jacket has 5 plastic buttons on the front side of the jacket.
- There are 2 zippered pockets on the waist part of the jacket.
- There is a pen pocket with zipper on the left sleeve of the jacket.
- Sleeve patch is sewn to each sleeve.
- There are 4 buttons on the front side of the trousers.
- On the side parts of the trousers, there are 2 flap pockets with a fold.
- There are 2 welted flap pockets at the back of the trousers.
- A rubber rope is inserted into the turn up part of the trouser legs.
- Sizes 39-42-45-48-51-54-57-60-63, Drops A-B-C-D



## WIND JACKET, DESERT TYPE

- Material type is % 50 cotton and %50 polyester
- The weight of the fabric per square meter is 235 g/m<sup>2</sup>.
- There are 2 zippered pockets on the chest part of the jacket.
- A rubber rope is inserted into the turn up part of the waist.
- There exists a hideable hood on the back side of the collar.
- There are adjustable sleeve latches.
- Inside part of the jacket is quilted.
- Sizes 45-48-51-54-57-60-63, Drops A-B-C-D



## JACKET, COMMANDO, OPERATION

- Material type is % 65 cotton and %35 polyester.
- The weight of the fabric per square meter is 220-235 g/m<sup>2</sup>.
- The fabric's pattern is 2/2 twill.
- The collar type of the jacket is stand collar.
- The front body has 2 zippered welt pockets.
- There are zippered pockets on the sleeves.
- There are 5 adjustable buttons on the front side of the jacket.
- There are adjustable sleeve latches.
- Sizes 44-46-48-50-52-54-56-58-60



## TROUSERS, COMMANDO, OPERATION

- Material type is % 65 cotton and %35 polyester.
- The weight of the fabric per square meter is 220-235 g/m<sup>2</sup>.
- The fabric's pattern is 2/2 twill.
- There are side pockets on the both sides of the trousers.
- Trousers include 3 flap pockets with a fold.
- There are 2 zippered pockets on the trousers.
- There are patches on the knee and crotch parts of the trousers.
- 2 rubbers are sewn on the both sides of the waist.
- A rubber rope is inserted into the turn up part of the trouser legs.
- There are adjustment latches on the both sides of the trouser legs.
- Sizes 44-46-48-50-52-54-56-58-69





## CAMOUFLAGED, TANK STAFF COVERALL

- Material type is % 65 cotton and %35 polyester.
- The weight of the fabric per square meter is 220-235 g/m<sup>2</sup>.
- The fabric's pattern is 2/2 twill.
- There is a zipper in front of the coveralls.
- There is a pen pocket with zipper on the left sleeve of the coveralls.
- There are 6 zippered welt pockets on the front side of the coveralls.
- There are zippers and folds on the side seams of the trouser legs.
- There is a rubber at the waist part of the coveralls.
- There are 4 reflector bands on the chest part and trouser legs.
- There are adjustment latches on the both sides of the sleeve cuffs.
- Sizes 46-48-50-52-54-56-58-60, Drops A-B-C-D-E-F



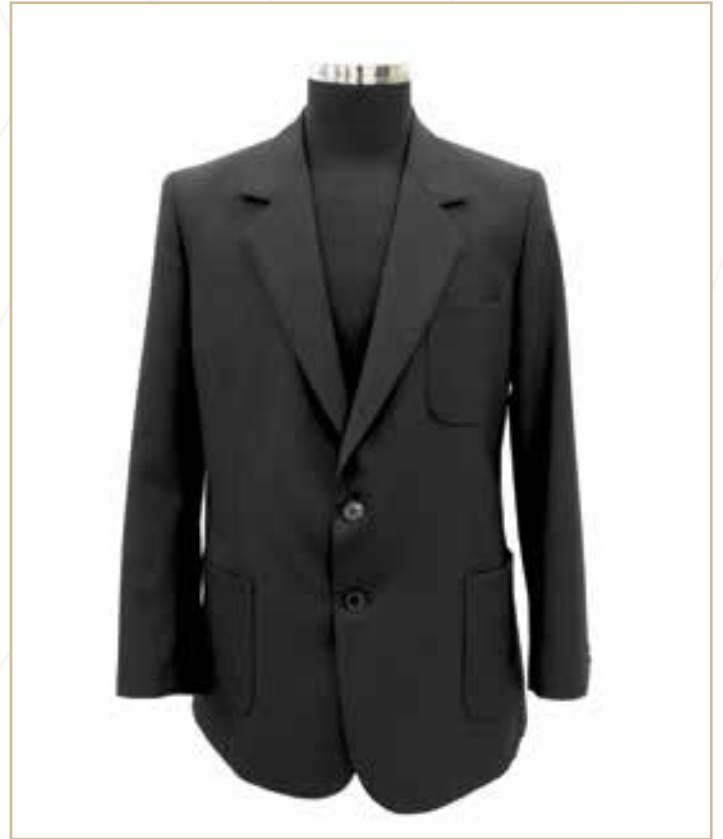
## KHAKI, WORKING COVERALLS

- Material type is % 50 cotton and %50 polyester.
- The weight of the fabric per square meter is 235 g/m<sup>2</sup>.
- There are 8 plastic buttons on the front side of the coveralls.
- The coveralls has a reverse collar.
- There are 2 pockets on the chest part and 2 pockets on the waist part of the coveralls.
- Sizes 48-50, 52-54 and 56-58



## DRESS, GENERAL POST AND RECEPTIONIST

- The dress consists of a jacket and trousers.
- Material type is %50 wool and the rest contains polyester.
- The weight of the fabric per square meter is 270 g/m<sup>2</sup>.
- The type of collar is the male collar with notch lapel.
- There are 2 buttons on the front side of the jacket.
- There are slits and 2 buttons on the both sides of the sleeve hems.
- The jacket has 2 pockets on the waist part and 1 oval pocket on the chest part of the jacket.
- The inside part of the jacket is fully (%100) lined with black polyester.
- There are side pockets on both sides of the trousers.
- Sizes 42-44-46-48-50-52-54-56-58,  
Drops A-B-C-D-E-F-G-H



## DRESS, LIBERATION WAR

It is produced for historical or demonstration units.



## DRESS, GALLIPOLI WAR

It is produced for historical or demonstration units.



## DRESS, KOREAN WAR

It is produced for historical or demonstration units.



## DRESS, CYPRUS WAR

It is produced for historical or demonstration units.



## BERET, WOOL, BLACK

- Material type is % 70 wool and %30 polyester.
- The weight of the fabric per square meter is 450 g/m<sup>2</sup>.
- The fabric's pattern is 3/1 twill.



## BERET, WOOL, BLUE

- Material type is % 70 wool and %30 polyester.
- The weight of the fabric per square meter is 450 g/m<sup>2</sup>.
- The fabric's pattern is 3/1 twill.



## HAT, OFFICER, KHAKI, SEASONAL

- Material type is % 66 wool, % 2 elastane and the rest contains polyamide.
- The weight of the fabric per square meter is 205±10 g/m<sup>2</sup>.
- The fabric's pattern is 2/1 twill.
- It is used with uniform No 1.



## HAT, OFFICER, KHAKI, SEASONAL, WOMAN

- Material type is % 66 wool, % 2 elastane and the rest contains polyamide.
- The weight of the fabric per square meter is 205±10 g/m<sup>2</sup>.
- The fabric's pattern is 2/1 twill.
- It is used with uniform No 1.



## HAT, MESDRESS, BLACK

- Material type is % 60 wool and % 40 polyester.
- The weight of the fabric per square meter is 220 g/m<sup>2</sup>.
- It is used with dress mesdress.



## HAT, KHAKI, BAND AND HARMONICA BAND

- Material type is % 66 wool, % 2 elastane and the rest contains polyamide.
- The weight of the fabric per square meter is 205±10 g/m<sup>2</sup>.
- The fabric's pattern is 2/1 twill.

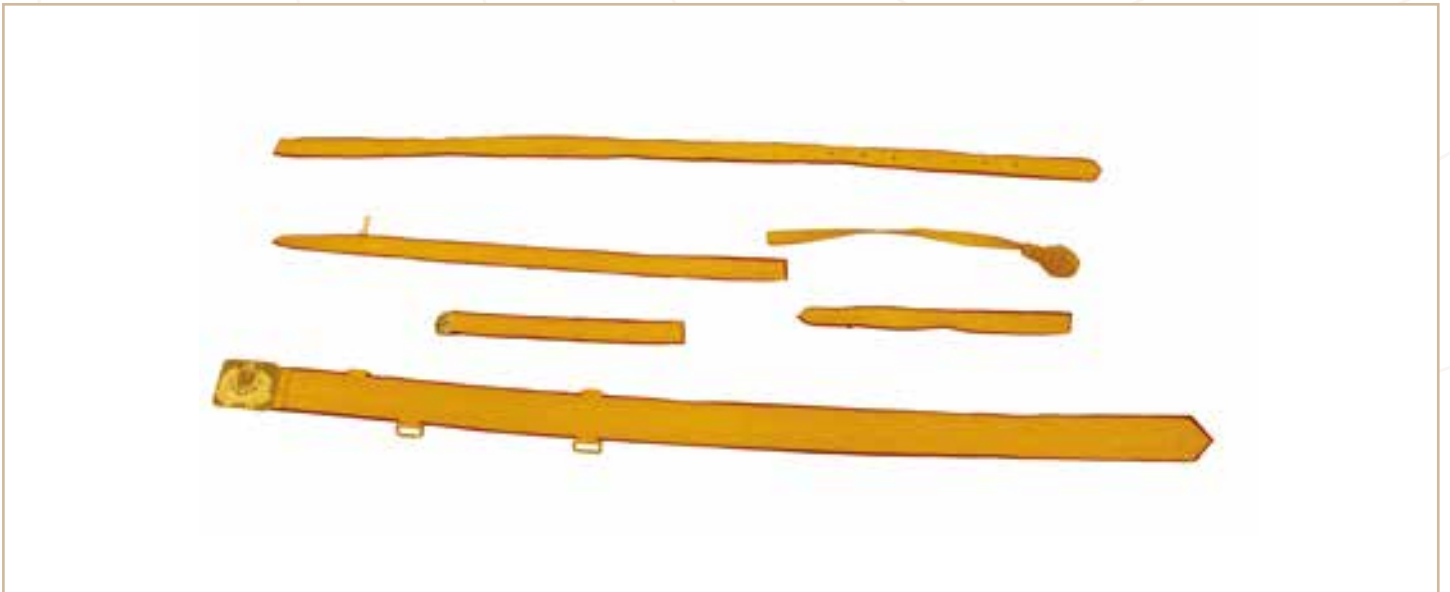


## HAT, DESERT TYPE

- Material type is % 50 cotton and %50 polyester.
- The weight of the fabric per square meter is 215 g/m<sup>2</sup>.



# EMBROIDERY









**NAVY SEWING &  
TAILORING SHOP  
DIRECTORATE**

## NAVY SEWING & TAILORING SHOP DIRECTORATE

### COAT, SERVICE DRESS, BLACK

- Made out of 50/50 polyester wool fabric
- The fabric's pattern is 2/2 twill.
- The fabric's weight is 255 g/m<sup>2</sup>.
- The buttons are nickel-plated and gold-plated.
- Rank: Gold sleeve device/lace (officer), insignia of rank (chief/NCO)



### TROUSERS, SERVICE DRESS, BLACK

- Made out of 50/50 polyester wool fabric
- The fabric's pattern is 2/2 twill.
- The fabric's weight is 255 g/m<sup>2</sup>.
- Worn with black belt, gold buckle



### COAT, SERVICE DRESS, WHITE

- Made out of polyester fabric
- The fabric's pattern is 1/2 twill.
- The fabric's weight is 210 g/m<sup>2</sup>.
- The buttons are nickel-plated and gold-plated.
- Rank: Shoulder boards, hard (officer), insignia of rank (chief/NCO)



### TROUSERS, SERVICE DRESS, WHITE

- Made out of polyester fabric
- The fabric's pattern is 1/2 twill.
- The fabric's weight is 210 g/m<sup>2</sup>.
- Worn with white belt, gold buckle



## NAVY SEWING & TAILORING SHOP DIRECTORATE

### SHIRT, WHITE SUMMER

- Made out of polyester fabric
- The fabric's pattern is 1/2 twill.
- The fabric's weight is 210 g/m<sup>2</sup>.
- The buttons are nickel-plated and gold-plated.
- Rank: Shoulder boards, hard (officer), insignia of rank (chief/NCO)



### TROUSERS, WHITE SUMMER

- Made out of polyester fabric
- The fabric's pattern is 1/2 twill.
- The fabric's weight is 210 g/m<sup>2</sup>.
- Worn with white belt, gold buckle



### COAT AND SKIRT, WOMEN, SERVICE DRESS, WHITE

- Made out of polyester fabric
- The fabric's pattern is 1/2 twill.
- The fabric's weight is 210 g/m<sup>2</sup>.
- The buttons are nickel-plated and gold-plated.



## NAVY SEWING & TAILORING SHOP DIRECTORATE

### SHIRT, BLUE, WORKING, LONG SLEEVE

- Made out of 50/50 polyester cotton fabric
- The fabric's pattern is plain (ripstop).
- The fabric's weight is 140 g/m<sup>2</sup>.
- The buttons are plastic.
- Rank: Shoulder boards (officer), insignia of rank (chief/NCO)



### SHIRT, BLUE, WORKING, SHORT SLEEVE

- Made out of 50/50 polyester cotton fabric
- The fabric's pattern is plain (ripstop).
- The fabric's weight is 140 g/m<sup>2</sup>.
- The buttons are plastic.
- Rank: Shoulder boards (officer), insignia of rank (chief/NCO)



### TROUSERS, NAVY BLUE, WORKING

- Made out of 78/20/2 polyester viscose elastane
- The fabric's pattern is 1/2 twill.
- The fabric's weight is 235 g/m<sup>2</sup>.
- Worn with navy blue belt, yellow buckle.



## NAVY SEWING & TAILORING SHOP DIRECTORATE

### SHIRT, CAMOUFLAGE, WORKING

- Made out of 50/50 polyamide cotton fabric
- The fabric's pattern is plain (ripstop).
- The fabric's weight is 215 g/m<sup>2</sup>.
- The buttons are plastic.
- Rank: Shoulder boards (officer), insignia of rank (chief/NCO)



### PARKA, CAMOUFLAGE, WORKING

- Made out of 50/50 polyamide cotton fabric
- The fabric's pattern is plain (ripstop).
- The fabric's weight is 215 g/m<sup>2</sup>.
- The buttons are plastic.
- Rank: Shoulder boards (officer), insignia of rank (chief/NCO)



### TROUSERS, CAMOUFLAGE, WORKING

- Made out of 50/50 polyamide cotton fabric
- The fabric's pattern is plain (ripstop).
- The fabric's weight is 215 g/m<sup>2</sup>.
- Worn with khaki belt, plastic buckle



## NAVY SEWING & TAILORING SHOP DIRECTORATE

### COLD WEATHER PARKA (CWP), NAVY BLUE, WORKING

- Made out of polyester fabric, laminated 3 layers
- The fabric's pattern is plain.
- The fabric's weight is 240 g/m<sup>2</sup>.
- Demountable polar fleece inside
- Rank: Shoulder boards (officer), insignia of rank (chief/NCO)



### FLIGHT SUIT, FIRE RESISTANT (FR), SAGE GREEN

- Made out of %1 antistatic, rest meta-aramid fabric
- The fabric's pattern is plain.
- The fabric's weight is 158 g/m<sup>2</sup>.
- Double key fire resistant zipper is used in the front part.
- Rank: Shoulder boards (officer), insignia of rank (chief/NCO).



### FLIGHT JACKET, FIRE RESISTANT (FR), SAGE GREEN

- Made out of %1 antistatic, rest meta-aramid fabric
- The fabric's pattern is plain.
- The fabric's weight is 158 g/m<sup>2</sup>.
- Metal fire resistant zipper is used in the front part.
- Rank: Shoulder boards (officer), insignia of rank (chief/NCO)



# NAVY SEWING & TAILORING SHOP DIRECTORATE

## SHOULDER BOARD, HARD, SERVICE

- Plastic material coated with black fabric embroidered gold lace
- For officers



## SHOULDER BOARD, SERVICE/WORKING

- Black fabric embroidered gold lace
- For officers



## SHOULDER BOARD, CAMOUFLAGE, WORKING

- Camouflage fabric embroidered dark green lace
- For officers



## INSIGNIA OF RANK, BLACK, SERVICE

- Black fabric embroidered gold lace
- For chiefs/NCOs



## INSIGNIA OF RANK, WHITE, SERVICE

- White fabric embroidered gold lace
- For chiefs/NCOs



## INSIGNIA OF RANK, BLUE, WORKING

- Blue fabric embroidered yellow lace
- For chiefs/NCOs



## INSIGNIA OF RANK, CAMOUFLAGE, WORKING

- Camouflage fabric embroidered dark green lace
- For chiefs/NCOs



## NAVY SEWING & TAILORING SHOP DIRECTORATE

### CAP, COMBINATION WHITE, MEN, OFFICER, SERVICE

- For male officers



### CAP, COMBINATION WHITE, WOMEN, OFFICER, SERVICE

- For female officers



### CAP, COMBINATION WHITE, MEN, CHIEF/NCO, SERVICE

- For chiefs/NCOs



### CAP, BALL, NAVY BLUE, WORKING

- Navy blue fabric embroidered gold lace
- For officers and chiefs/NCOs



### CAP, EIGHT POINT, CAMOUFLAGE, WORKING

- Camouflage fabric embroidered dark green lace
- For officers and chiefs/NCOs



### CAP, KHAKI SERVICE GARRISON FOR FLYERS

- Made out of 50/50 cotton polyester fabric
- The fabric's pattern is 2/1 twill.
- The fabric's weight is 210 g/m<sup>2</sup>.
- For officers and chiefs/NCOs





## NAVY SEWING & TAILORING SHOP DIRECTORATE

### WAISTCOAT, BLACK, SERVICE

- Made out of 50/50 polyester wool fabric
- The fabric's pattern is 2/2 twill.
- The fabric's weight is 255 g/m<sup>2</sup>.
- The buttons are nickel-plated and gold-plated.
- Plastic chest ranks
- For officers and chiefs/NCOs



### JACKET, BLACK, SERVICE

- Made out of 50/50 polyester wool fabric
- The fabric's weight is 280 g/m<sup>2</sup>.
- Plastic chest badge for officers and chiefs/NCOs
- Rank: Shoulder boards (officer), insignia of rank (chief/NCO)



### BRIDGECOAT (OVERCOAT), BLACK, SERVICE

- Made out of 15/85 polyester wool fabric
- The fabric's pattern is 3/1 twill.
- The fabric's weight is 540 g/m<sup>2</sup>.
- The buttons are nickel-plated and gold-plated.
- Rank: Shoulder boards, hard (officer), insignia of rank (chief/NCO)



## NAVY SEWING & TAILORING SHOP DIRECTORATE

### COAT, DINNER DRESS, WINTER, BLACK

- Made out of 40/60 polyester wool fabric.
- The fabric's weight is 220 g/m<sup>2</sup>.
- The buttons are nickel-plated and gold-plated.
- Worn with bow tie black and shirt white
- Rank: Gold sleeve device/lace (officer), insignia of rank (chief/NCO)



### COAT, DINNER DRESS, SUMMER, WHITE

- Made out of polyester fabric
- The fabric's pattern is 1/2 twill.
- The fabric's weight is 210 g/m<sup>2</sup>.
- The buttons are nickel-plated and gold-plated.
- Worn with bow tie black and shirt white
- Rank: Shoulder boards, hard (officer), insignia of rank (chief/NCO)



### TROUSERS, DINNER DRESS, BLACK/WHITE

- Made out of 40/60 polyester wool fabric
- The fabric's weight is 220 g/m<sup>2</sup>.
- Two sides rims gold lace
- Worn with cummerbund, black and coat, black/white



## NAVY SEWING & TAILORING SHOP DIRECTORATE

### SWORD BELT

- Gold strips are sewn on black fabric.
- Buckles are nickel-plated and gold-plated.



### WORKING COVERALL, NAVY BLUE

- Worn uniforms not to unduly soiled
- Made out of 35/65 polyester cotton fabric
- The fabric's pattern is plain (ripstop).
- The fabric's weight is 250 g/m<sup>2</sup>.
- Front and back reflective tapes are sewn on coverall







# AIR SEWING & TAILORING SHOP DIRECTORATE

## SERVICE GROUP

### DRESS NAVY BLUE SUMMER/WINTER

#### JACKET

- Fabric contains 55% polyester and 45% wool fibres.
- The pattern of summer fabric is 2/1 twill and the winter fabric is 2/2.
- The summer fabric weight is 200 g/m<sup>2</sup> and the winter fabric is 230 g/m<sup>2</sup>.
- 100% polyester lining is used for the inside part of the jacket.
- The buttons have embossed eagle motifs. The buttons are nickel-plated and gold-plated.
- The button holes are on the left, the buttons are on the right.

#### TROUSERS

- Fabric contains 55% polyester and 45% wool fibres.
- The pattern of summer fabric is 2/1 twill and the winter fabric is 2/2.
- The summer fabric weight is 200 g/m<sup>2</sup> and the winter fabric is 230 g/m<sup>2</sup>.
- There is an elastomer belt for shirt-keeper in the belt lining.
- An automatic locked cursor spiral zipper is used.

### TROUSERS NAVY BLUE SUMMER/WINTER

- Fabric contains 55% polyester and 45% wool fibres.
- The pattern of summer fabric is 2/1 twill and the winter fabric is 2/2.
- The summer fabric weight is 200 g/m<sup>2</sup> and the winter fabric is 230 g/m<sup>2</sup>.
- There is an elastomer belt for shirt-keeper in the belt lining.
- An automatic locked cursor spiral zipper is used.

### WAISTCOAT

- Fabric contains 55% polyester and 45% wool fibres.
- The pattern of fabric is 2/2 twill.
- The fabric weight is 230 g/m<sup>2</sup>.
- 100% polyester lining is used for the inside part of the vest.
- Vest with open "V" collar.
- On the front part there are two welt pockets, one is on the right side and other is on the left side.
- The vest is closed by 5 buttons.
- Miniature rank mark of the vest is on left chest part.



## SERVICE GROUP

### JACKET SUMMER/WINTER NAVY BLUE OFFICER WOMAN

- Fabric contains 55% polyester and 45% wool fibres.
- The pattern of summer fabric is 2/1 twill and the winter fabric is 2/2.
- The summer fabric weight is 200 g/m<sup>2</sup> and the winter fabric is 230 g/m<sup>2</sup>.
- 100% polyester lining is used for the inside part of the jacket.
- The buttons used have embossed eagle motifs. The buttons are nickelplated and gold-plated.
- There are no flaps on the upper pockets.
- The buttonholes are on the right, the buttons are on the left.
- Jacket dart stitches are available at various locations on the jacket to ensure proper fit of the jacket.



### SKIRT NAVY BLUE FOR WOMAN OFFICERS SUMMER/WINTER

- Fabric contains 55% polyester and 45% wool fibres.
- The pattern of summer fabric is 2/1 twill and the winter fabric's is 2/2.
- The summer fabric weight is 200 g/m<sup>2</sup> and the winter fabric is 230 g/m<sup>2</sup>.
- The length is 1-2 cm lower from the knee-pans.
- There are two darts on the side part and front part and on the back there is a 15 cm-slit closed with a zipper.
- The zipper is placed between stitch folds in order not to be seen from outside.



### TROUSERS NAVY BLUE FOR WOMAN OFFICERS SUMMER/WINTER

- Fabric contains 55% polyester and 45% wool fibres.
- The pattern of summer fabric is 2/1 twill and the winter fabric is 2/2.
- The summer fabric weight is 200 g/m<sup>2</sup> and the winter fabric is 230 g/m<sup>2</sup>.
- There is an elastomer belt for shirt-keeper in the belt lining.
- An automatic locked cursor spiral zipper is used.



### TOPCOAT

- Fabric contains 50% polyester and 50% wool fibres.
- The fabric weight is 280 g/m<sup>2</sup>.
- The inside part of the coats is quilted.
- On the waist part of the garment there is a belt which has a plastic buckle at the end of it and is made of two-layer topcoat cloth.
- The front side of the topcoat is covered by 3 large size buttons on the right front part. The 3 large size buttons on the left front part are for decoration purpose.
- There is one side pocket on the right and left front parts of topcoat.

## SERVICE GROUP

### COAT NAVY BLUE

- Fabric contains 50% polyester and 50% wool fibres.
- The fabric weight is 280 g/m<sup>2</sup>.
- The inside part of the coat is quilted.
- The collar type of the coat is straight collar and hardened by interlining.
- Bone zipper with automatic locking function is used on the front part.
- On the left front part there are a closure part covering the zipper part and a two-fold section fixed from the waist and collar.



### SUIT/ MESS DRESS

- Fabric contains 55% polyester and 45% wool fibres.
- The fabric pattern is 2/2 twill.
- The fabric weight is 230 g/m<sup>2</sup>.
- 100% polyester lining is used for the inside part of the jacket.
- The buttons have embossed eagle motifs. The buttons are nickel-plated and gold-plated.
- It has a double breasted collar and two buttons are connected by a front chain.
- 3 large size buttons on the right and left front parts are for decoration purpose.
- There is an elastomer belt for shirt-keeper in the belt lining.
- An automatic locked cursor spiral zipper is used.
- Officers trousers have a red rim of 2 cm in width along the side seams.





## SERVICE GROUP

### SHAWL COLLAR WHITE JACKET

- Fabric contains 40% polyester and 60% wool fibres.
- The fabric weight is 220 g/m<sup>2</sup>.
- 100% polyester lining is used for the inside part of the jacket.
- The buttons have embossed eagle motifs. The buttons are nickelplated and gold-plated.
- The collar is in the shape of shawl collar and has two buttons connected by the chain on the front.
- 3 large size buttons on the right and left front parts are for decoration purpose.



### TROUSERS MESS DRESS

- Fabric contains 55% polyester, 45% wool fibres.
- The pattern of fabric is 2/2 twill.
- The fabric weight is 230 g/m<sup>2</sup>.
- There is an elastomer belt for shirt-keeper in the belt linnig.
- An automatic locked cursor spiral zipper is used.



### MESS DRESS WOMEN JACKET

- Fabric contains 55% polyester and 45% wool fibres.
- The pattern fabric's is 2/2 twill.
- The fabric weight is 230 g/m<sup>2</sup>.
- 100% polyester lining is used for the inside part of the jacket.
- The buttons used embossed eagle motifs. The buttons are nickelplated and gold-plated.
- The double breasted and two buttons are connected by the front chain.
- 3 large size buttons on the right and left front parts are for decoration purpose.



### MESS DRESS SKIRT

- Fabric contains 55% polyester and 45% wool fibres.
- The pattern fabric's is 2/2 twill.
- The fabric weight is 230 g/m<sup>2</sup>.
- It is long skirt type and it is straight.



## SERVICE GROUP

### BAND DRESS

- Fabric contains 55% polyester and 45% wool fibres.
- The pattern fabric is 2/2 twill.
- The fabric weight is 230 g/m<sup>2</sup>.
- 100% polyester lining is used for the inside part of the jacket.
- The buttons have embossed eagle motifs. The buttons are nickelplated and gold-plated.
- Double breasted collar.
- There are 4 cm wide strips on the sleeves.
- On the left shoulder there is a yellow cord with ring inside the ring.



### TROUSERS

- Fabric contains 55% polyester and 45% wool fibres.
- The pattern of summer fabric is 2/2 twill.
- The fabric weight is 230 g/m<sup>2</sup>.
- There is an elastomer belt for shirt-keeper in the belt lining.
- An automatic locked cursor spiral zipper is used.
- There is 1,5 cm wide strip along the side seam.



### COAT CEREMONY LONG

- Fabric contains 15% polyester and 85% wool fibres.
- The pattern of fabric is 3/1.
- The fabric weight is 540 g/m<sup>2</sup>.
- 100% polyester lining is used in the inside part of jacket.
- The buttons have embossed eagle motifs. The buttons are nickelplated and gold-plated.
- The front side of overcoat is covered by 3 large size buttons on the right front part.
- The large buttons on the left front part (3 pieces) and near-neck part (2 pieces) are for decoration purpose.



# SHIRTS

## SHIRT SKY COLOR METAL BUTTONED

- Fabric contains 50% polyester and 50% viscose.
- The fabric pattern is plain.
- The fabric weight is 160 g/m<sup>2</sup>.
- Front embossed eagle motif, nickel and gold plated metal buttons.
- There are two pockets on the chest, with no flaps.
- Inside the left pocket there is also a pen pocket.



## SHIRT SKY COLOR SHORT SLEEVE

- Fabric contains 50% polyester and 50% viscose fibers.
- The fabric pattern is plain.
- The fabric weight is 160 g/m<sup>2</sup>.
- There are plastic buttons on the front part.
- Front and rear lower ends are oval shaped.



## SHIRT SKY COLOR LONG SLEEVE

- Fabric contains 50% polyester and 50% viscose fibers.
- The fabric pattern is plain.
- The fabric weight is 160 g/m<sup>2</sup>.
- There are plastic buttons on the front part.
- Front and rear lower ends are oval shaped.



## BAND SHIRT SHORT SLEEVE

- Fabric contains 50% polyester and 50% viscose fibers.
- The fabric pattern is plain.
- The fabric weight is 160 g/m<sup>2</sup>.
- Front embossed eagle motif, nickel and gold plated metal buttons
- There are 2 flap pockets with metal buttons on the chest.
- Thin strips are available on the shoulders for attachment of the epaulette.



## SHIRTS

### SHIRT MESS DRESS

- Fabric contains 67% polyester and 33% viscose fibers.
- The pattern of fabric is plain.
- The fabric weight is 190 g/m<sup>2</sup>.
- The front buttons are closed with fabric.
- Front and rear lower ends are oval shaped.
- There is a flapless pocket on the left chest.



### SHIRT WHITE LONG SLEEVE

- Fabric contains 67% polyester and 33% viscose fibers.
- The pattern of fabric is plain.
- The fabric weight is 190 g/m<sup>2</sup>.
- It has plastic buttons on the front part and it has a straight collar.
- Front and rear lower ends are oval shaped.
- The left chest has a pocket without a flap.



### SHIRT WHITE SHORT SLEEVE

- Fabric contains 67% polyester and 33% viscose fibers.
- The fabric pattern is plain.
- The fabric weight is 190 g/m<sup>2</sup>.
- The collar has plastic whales attached to its ends.
- Front and rear lower ends are oval shaped.
- The left chest has a pocket without flap.



## FLIGHT GROUP

### FLIGHT SUIT

- Fabric contains 99% Meta Aramid and 1% Anti Static fibres.
- The pattern of fabric is plain.
- The fabric weight is 158 g/m<sup>2</sup>.
- The fabric is resistant to burning.
- Double key zipper with metal cursor is used in the front part.
- There are two chest pockets with zipper.



### FLIGHT JACKET

- Fabric contains 99% Meta Aramid and 1% Anti Static fibres.
- The fabric weight is 158 g/m<sup>2</sup>.
- The fabric is resistant to burning.
- The fabric pattern is plain.
- Metal zipper is used in the front part.



## FLIGHT GROUP

### FLIGHT SUIT RED (TURKISH STARS)

- Produced from 100% Aramid fibres.
- The fabric is resistant to burning.
- The fabric pattern is plain.
- The fabric weight is 145 g/m<sup>2</sup>.
- The logo of the Turkish Stars is embroidery on the back with white thread.



### FLIGHT JACKET RED (TURKISH STARS)

- Produced from 100% Aramid fibres.
- The fabric is resistant to burning.
- The fabric pattern is plain.
- The fabric weight is 145 g/m<sup>2</sup>.
- Metal zipper is used in the front part.
- An orange colored zipper and removable quilting are available inside of jacket.
- The logo of the Turkish Stars is embroidery on the back with white thread.



### TURKISH STARS HAT

- There are two holes on the top of hat in order to receive air.
- The inside of the hat is uncoated.
- Tightness can be adjusted by means of the belt at the rear.



## FLIGHT GROUP

### FLIGHT SUIT NAVY BLUE (PRESS)

- Fabric contains 55% Polyester and 45% Wool fibres.
- The pattern of fabric is 2/2 twill.
- The fabric weight is 230 g/m<sup>2</sup>.
- Double key zipper with metal cursor is used in the front part.
- There are two chest pockets with zipper.
- There is white and gray processing on the shoulder parts.
- The logo of the Turkish Stars is embroidery on the back with white thread.



### FLIGHT JACKET NAVY BLUE (PRESS)

- Fabric contains 55% Polyester and 45% Wool fibres.
- The pattern of fabric is 2/2 twill.
- The fabric weight is 230 g/m<sup>2</sup>.
- There is white and gray processing on the shoulder parts.
- The logo of the Turkish Stars is embroidery on the back with white thread.



### FLIGHT SUIT NAVY BLUE (TECHNICAL TEAM)

- Fabric contains 55% Polyester and 45% Wool fibres.
- The pattern of fabric is 2/2 twill.
- The fabric weight is 230 g/m<sup>2</sup>.
- The logo of the Turkish Stars is embroidery on the back with white thread.



## FLIGHT GROUP

### FLIGHT JACKET NAVY BLUE (TECHNICAL TEAM)

- Fabric contains 55% Polyester and 45% Wool fibres.
- The pattern of fabric is 2/2 twill.
- The fabric weight is 230 g/m<sup>2</sup>.
- The logo of the Turkish Stars is embroidery on the back with white thread.



### SOLOTURK HAT

- Hat is six pieces sports hat model.
- There are two holes on the top of hat in order to receive air.
- The inside of the hat is uncoated.



### FLIGHT SUIT (SOLOTURK)

- Produced from 100% Aramid fibres.
- The fabric is resistant to burning.
- The fabric's pattern is plain.
- The fabric weight is 145 g/m<sup>2</sup>.
- Double key zipper with metal cursor is used in the front part.
- There are two chest pockets with zipper.





## FLIGHT GROUP

### FLIGHT JACKET BLACK (SOLOTURK)

- Produced from 100% Aramid fibres.
- The fabric is resistant to burning.
- The fabric pattern is plain.
- The fabric weight is 145 g/m<sup>2</sup>.
- Metal zipper is used in the front part.



### FLIGHT SUIT KHAKI

- Produced from 99% Meta Aramid and 1% Anti Static fibres.
- The fabric is resistant to burning.
- The fabric pattern is plain.
- The fabric weight is 158 g/m<sup>2</sup>.



### FLIGHT JACKET KHAKI

- Produced from 99% Meta Aramid and 1% Anti Static fibres.
- The fabric is resistant to burning.
- The fabric's pattern is plain.
- The fabric weight is 158 g/m<sup>2</sup>.
- An orange removable quilting are available inside of jacket.



## TRAINING GROUP

### DRESS TRAINING

- The fabric is dyed on the ground and the face camouflage is printed.
- Fabric contains 50% Poliamid 6.6, 50% cotton fibres.
- The pattern of the fabric is 1/1 twill.
- The fabric weight is 205 g/m<sup>2</sup>.
- There is water repellent feature.

### TROUSERS

- The fabric is dyed on the ground and the face camouflage is printed.
- Fabric contains 50% Poliamid 6.6, 50% cotton fibres.
- The pattern of the fabric is 1/1 twill.
- The fabric weight is 205 g/m<sup>2</sup>.
- There is water repellent feature.

### PARKA

- The fabric is painted on the ground and the face camouflage is printed.
- Fabric contains 50% Poliamid 6.6, 50% cotton fibres.
- The pattern fabric is 1/1 twill.
- The fabric weight is 225 g/m<sup>2</sup>.
- There is water repellent feature.

### VEST ATTACK

- Vest attack is made of camouflaged training cloth.
- There are five carrying pockets on the waist and one carrying pocket on the chest.
- There are also a radio pocket on the chest.
- It is connected to the back by the strip and buckle and the tightness is adjusted.



## TRAINING GROUP

### JUMPSUIT

- The fabric is dyed on the ground and the face camouflage is printed.
- Fabric contains 15% Polyester, 85% cotton fibres.
- The pattern fabric is 2/2 twill.
- The fabric weight is 220 g/m<sup>2</sup>.
- There is water repellent feature.



### DRESS COLD CLIMATE

- There are 3 layers on the garment, outer fabric, center layer and inner lining.
- The fabric weight is 350 g/m<sup>2</sup>.
- It is waterproof.



### HAT CAMOUFLAGE OFFICER

- Hat is made from camouflage training cloth.



## TRAINING GROUP

### DRESS WINTER WORK SOLDIER

- Fabric contains 67% polyester and 33% viscose fibers.
- The fabric weight is 220 g/m<sup>2</sup>.
- The fabric's pattern is plain.
- Cotton lining fabric is available on the inside part.
- There is one pocket on the left chest and two pockets without a flap on the front side.
- Velcro straps are available for easy joining.
- Spiral zipper with automatic locking function is used.



### TROUSERS

- Fabric contains 67% polyester and 33% viscose fibers.
- The fabric weight is 220 g/m<sup>2</sup>.
- The fabric's pattern is plain.
- Spiral zipper with automatic locking function is used.
- The waist part is joined by means of a hook.
- There is a pocket on the right of the back part.



### HAT

- Fabric contains 67% polyester and 33% viscose fibers.



### DRESS SUMMER WORK SOLDIER

- Fabric contains 67% polyester and 33% viscose fibers.
- The fabric weight is 220 g/m<sup>2</sup>.
- The fabric's pattern is plain.
- There is one pocket on the left chest and two pocket without a flap on the front side.
- Velcro straps are available for easy joining.



## TRAINING GROUP

### TROUSERS

- Fabric contains 67% polyester and 33% viscose fibers.
- The fabric weight is 220 g/m<sup>2</sup>.
- The fabric's pattern is plain.
- Spiral zipper with automatic locking function is used.
- There is a pocket on the right of the back part.



### HAT

- Fabric contains 67% polyester and 33% viscose fibers.



### OVERALLS WINTER WORK SOLDIER

- Fabric contains 67% polyester and 33% viscose fibers.
- The fabric weight is 220 g/m<sup>2</sup>.
- The fabric's pattern is plain.
- The front part is closed with six snaps.
- There is a fabric belt on the waist. Waist tightness can be adjusted through the velcro straps at the ends of the belt.
- There are two pockets on the chest.
- There are two pockets on the front side and two pockets on the back side.



### SMOCK LONG-LONG SLEEVE MAN

- Fabric contains 67% polyester and 33% viscose fibers.
- The fabric weight is 220 g/m<sup>2</sup>.
- The fabric's pattern is plain.
- There are large plastic buttons on the front part (4 pieces).
- There are two pockets. Flapless first one is on the left chest and flapless second one is on the front side.



## TRAINING GROUP

### SMOCK SHORT-LONG SLEEVE MAN

- Fabric contains 67% polyester and 33% viscose fibers.
- The fabric weight 220 g/m<sup>2</sup>.
- The fabric's pattern is plain.
- Large plastic buttons are on the front part (5 pieces).
- There are two pockets. Flapless first one is on the left chest and flapless second one is on the front side.



### SMOCK SHORT-SHORT SLEEVE MAN

- Fabric contains 67% polyester and 33% viscose fibers.
- The fabric pattern 220 g/m<sup>2</sup>.
- The fabric's pattern is plain.
- Large plastic buttons are on the front part (4 pieces).
- There are two pockets. Flapless first one is on the left chest and flapless second one is on the front side.



### SMOCK LONG SHORT SLEEVE WOMAN

- Fabric contains 67% polyester and 33% viscose fibers.
- The fabric weight is 220 g/m<sup>2</sup>.
- The fabric pattern is plain.
- Large plastic buttons are on the front part (4 pieces).
- There are two pockets. Flapless first one is on the left chest and Flapless second one is on the front side.



## TRAINING GROUP

### SMOCK LONG-LONG SLEEVE WOMAN

- Fabric contains 67% polyester and 33% viscose fibers.
- The fabric weight is 220 g/m<sup>2</sup>.
- The fabric pattern is plain.
- Large plastic buttons are on the front part (4 pieces).
- There are two pockets. Flapless first one is on the left chest and flapless second one is on the front side.



### SMOCK SHORT-SHORT SLEEVE WOMAN

- Fabric contains 67% polyester and 33% viscose fibers.
- The fabric weight is 220 g/m<sup>2</sup>.
- The fabric pattern is plain.
- Large plastic buttons are on the front part (4 pieces).
- There are two pockets. Flapless first one is on the left chest and flapless second one is on the front side.



### SMOCK SHORT-LONG SLEEVE WOMAN

- Fabric contains 67% polyester and 33% viscose fibers.
- The fabric weight is 220 g/m<sup>2</sup>.
- The fabric pattern is plain.
- Large plastic buttons are on the front part (4 pieces).
- There are two pockets. There are one pocket without a flap on the left chest and two pockets without a flap on the front side.
- Short and long types are available.



## TRAINING GROUP

### PARKA WORKER PROTECTOR

- Fabric contains 55% polyester and 45% cotton fibers.
- The fabric weight is 220 g/m<sup>2</sup>.
- The pattern of fabric is 4/1 warp satin.
- The interior part of the parka is quilted.
- The hood can be removed and installed.
- Bone toothed zipper with automatic locking function is used.
- The zipper can be closed with five snap fasteners.
- The waist and hood are elastic.



### VEST WORKER

- Fabric contains 55% polyester and 45% cotton fibers.
- The fabric weight is 220 g/m<sup>2</sup>.
- The pattern of fabric is 4/1 warp satin.



### TROUSERS

- Fabric contains 55% polyester and 45% cotton fibers.
- The fabric weight is 220 g/m<sup>2</sup>.
- The pattern of fabric is 4/1 warp satin.





## TRAINING GROUP

### SOLDIER CEREMONY DRESS

- Fabric contains 55% polyester and 45% wool fibers.
- The pattern of fabric is 2/1.
- The fabric weight is 200 g/m<sup>2</sup>.
- Spiral zipper with automatic locking function is used.
- On the inside of the jacket, a lining with a texture of plain weave is used.
- Velcro straps are available for easy joining.



### TROUSERS

- Fabric contains 55% polyester and 45% wool fibers.
- The pattern of fabric is 2/1.
- The fabric weight is 200 g/m<sup>2</sup>.
- Spiral zipper with automatic locking function used.
- The lower part of the trousers leg can be squeezed by means of elastic cords.



### SOLDIER CEREMONY PARKA

- Fabric contains 50% Polyester and 50% wool fibers.
- The fabric weight is 280 g/m<sup>2</sup>.
- Bone zipper is used on the front.
- Inner part of the parka is quilted and can be separated by a zipper.
- There are snap fasteners to close the front part and there is waist and collar fixed sniper part.



## HATS

### OVAL CAP GENERAL

- Fabric contains 55% Polyester and 45% wool fibres.
- Cap keeps it's original form for a long time period. Stiffening cloth in the inner part of it.
- The top part of cap is designed as having bellows.
- In the outhter side part is there a 5 cm thick yellow piping glitter dust belt.
- A cockade is attached to the front left part of cap.



### OVAL CAP STUDENT-OFFICER

- Fabric contains 55% Polyester and 45% wool fibres.
- Cap keeps it's original form for a long time period stiffening cloth in the inner part of it.
- The top part of cap is designed as having bellows.
- In the outhter side part is there a 5 cm thick white piping glitter dust belt.
- A cockade is attached to the front left part of cap.



### OVAL CAP NONCOMMISSIONED OFFICER

- Fabric contains 55% Polyester and 45% wool fibres.
- Cap keeps it's original form for a long time period stiffening cloth in the inner part of it.
- The top part of cap is designed as having bellows.
- In the outhter side part is there a 5 cm thick black piping glitter dust belt.
- A cockade is attached to the front left part of cap.



### HAT/SUMMER – WINTER NAVY BLUE OFFICER MAN

- It is made from number 1 daily uniform fabric.
- It is composed of Sunshade, fabric and hilly parts.
- Sunshade is in oval shape and made of uniform fabric.
- A piece of yellow oak leaves are available.



### HAT/SUMMER – WINTER NAVY BLUE GENERAL MAN

- It is made from number 1 daily uniform fabric.
- Sunshade, fabric and hilly parts it occurs
- Sunshade is in oval shape and made from uniform fabrics.
- A piece of yellow oak leaves are available.



# HATS

## HAT/SUMMER – WINTER NAVY BLUE OFFICER / MAN

- It is made from number 1 daily uniform fabric.
- Sunshade, fabric and hilly parts it occurs.
- Sunscreen oval, made of plastic material



## BAND OFFICER HAT

- It is made from number 1 daily uniform fabric.
- Sunshade, fabric and hilly parts it occurs.
- Sunscreen oval, made of plastic material
- The yellow strip size is 4 cm except for the cloak.



## BAND NONCOMMISSION OFFICER HAT

- It is made from number 1 daily uniform fabric.
- Sunshade, fabric and hilly parts it occurs.
- Sunscreen oval, made of plastic material
- The yellow strip size is 4 cm except for the cloak.



## HAT/SUMMER – WINTER NAVY BLUE NONCOMMISSIONED OFFICER / MAN

- It is made from number 1 daily uniform fabric.
- Sunshade, fabric and hilly parts it occurs.
- Sunscreen oval, Made of plastic material.



## HAT/SUMMER – WINTER NAVY BLUE SPECIALIZED SERGEANT

- It is made from number 1 daily uniform fabric.
- Sunshade, fabric and hilly parts it occurs.
- Sunscreen oval, made of plastic material



## HATS

### HAT/SUMMER – WINTER NAVY BLUE FIELD OFFICER WOMAN

- It is made from number 1 daily uniform fabric.
- Sunshade, fabric and hilly parts it occurs.
- The side sections are raised at a height of 9 cm.
- The sides are made of two layers of hats and cloth to protect their shape.
- There is a line of oak leaf that is woven around the outer edge of the yellow simile.

### HAT/SUMMER – WINTER NAVY BLUE AIR WAR COLLEGE WOMAN

- It is made from number 1 daily uniform fabric.
- Sunshade, fabric and hilly parts it occurs.
- The side sections are raised at a height of 9 cm.
- The sides are made of two layers of hats and cloth to protect their shape.

### HAT/SUMMER – WINTER NAVY BLUE AIR HIGH SCHOOL

- Number 1 makes from Daily uniform fabric.
- Sunshade, fabric and hilly parts it occurs.
- Sunscreen oval, made of plastic material
- The rest area is black plastic.

### HAT/SUMMER – WINTER NAVY BLUE AIR WAR COLLEGE MAN

- It is made from number 1 daily uniform fabric.
- Sunshade, fabric and hilly parts it occurs.
- Sunscreen oval, made of plastic material
- The rest area and cloak is black plastic.

### TIE BLACK

- Fabric contains 67% polyester and 33% viscose fibers.
- The pattern of fabric is plain.
- Black color
- There are woven battens made of polyester fibres in the necktie.
- There are two different length ties: 142 cm and 157 cm in length.



## SERVICE ACCESSORIES

### SWORD BELT SET

- On the inside, 5 cm wide red cloth is available.
- A strip of gold helix was sewn on the fabric.
- It can be adjusted, it has staples and tip hooks.



### GAITER WHITE

- It is made of coated woven fabric.
- The front part is oval and long.
- It is fixed to the wrist by means of strips passed through the holes.



# RANKS

■ RANK TRAINING STUDENT



RANK YELLOW STUDENT



RANK TRAINING ■



■ RANK YELLOW



RANK CHEST MINIATURE



RANKS CHEST MINIATURE ■



■ RANKS CHEST MINIATURE



RANK YELLOW



RANK WHITE ■



■ NAME TAG



FLAG



RANK TRAINING ■



■ RANK TRAINING



COCKADE CONFECTION OFFICER BAND



COCKADE CONFECTION GENERAL ■



■ COAT OF ARMS 191 FLEET COMMAND





**MOND PHARMACEUTICAL  
FACTORY DIRECTORATE**

## MoND PHARMACEUTICAL FACTORY DIRECTORATE

Within the MoND Pharmaceutical Factory Directorate primarily, antidotes that are critically and strategically important against Chemical, Biological, Radiological and Nuclear (CBRN) weapons and medicine, bandage and dressing materials that our country may need in peace&war are produced and studies are carried out to develop formulations for new products.

### PRODUCTION DEPARTMENTS

- Tablet, Capsule Production and Blister Packaging Department
- Injection Production Department
- Solution Production Department
- Pomade and Powder Production Department
- Bandage and Dressing Materials Production Department

### TABLET, CAPSULE PRODUCTION AND BLISTER PACKAGING DEPARTMENT

CAPSULE LINE



AMPOULE STERILISATION



TABLET PRODUCTION



AMPOULE SEALING



ATROPINE AUTOINJECTOR AND CBRN ANTIDOTE AMPOULES





# MoND PHARMACEUTICAL FACTORY DIRECTORATE

## BANDAGE AND DRESSING MATERIALS PRODUCTION DEPARTMENT

### ■ DRESSINGS DEPARTMENT



### ■ PACKET VACUUM



Different sizes of sterile/nonsterile gauze, compression bandages and first aid field bandages are manufactured.

## SOLUTION PRODUCTION DEPARTMENT

Antiseptic and disinfectant solutions are manufactured.

### ■ SOLUTION FILLING STATION



### ■ SOLUTION PRODUCTION DEPARTMENT



# MoND PHARMACEUTICAL FACTORY DIRECTORATE

## POMADE AND POWDER PRODUCTION DEPARTMENT

In this unit, antimicrobial pharmaceutical products for topical use and camouflage paint are manufactured.

■ POMADE TANK



POWDER FILLING ■



## OTHER DEPARTMENTS

- Packaging
- Warehouse
- Inspection and Control Section
- Water Facility

## PACKAGING

The finished products are packaged in tubes, bottle or blister with two different external packing forms as pharmacy and hospital.

■ PACKAGING



BILISTERING ■



# MoND PHARMACEUTICAL FACTORY DIRECTORATE

## INSPECTION AND CONTROL SECTION

Routine classical, analytical and biological controls of all consumables that have a direct or indirect impact on product quality, especially active ingredients, auxiliary substances and packaging materials and all semi-finished and finished products are carried out.

ANALYTICAL TESTS IN QCL



MICROBIOLOGICAL TESTS IN QCL



## WAREHOUSE

It has been designed for storing all raw materials, consumables, semi-finished products, finished products in a controlled environment. It also includes special storing places specific for storing raw materials, quarantine, finished products, flammable materials, explosive materials and also specific for cold storage.

WAREHOUSE SECTIONS



DRUG MATERIALS STORING



# MoND PHARMACEUTICAL FACTORY DIRECTORATE

## WATER FACILITY

Water is very important to ensure the high standards in pharmaceutical production. The water system of our facilities consist of softened water unit, purified water and water for injection units.

### DISTILATE WATER PRODUCTION



### DEIONISED WATER TANKS



## PRODUCTS

### CAMPAIGN AND EXERCISE EQUIPMENTS

PRODUCT NAME	PACKAGING	ACTIVE INGREDIENT	INTENDED USE
Camouflage Paint 20g	20g Tube	Activated Coal, Vaseline	Camouflage
Halazone Tablet	25 Tablets	Halazone	Water disinfectant
Sodium Chloride Tablet	10 Tablets	Sodium Chloride	Keeping electrolite balance

### CBRN ANTIDOTES

PRODUCT NAME	PACKAGING	ACTIVE INGREDIENT	INTENDED USE
Atropine sulphate ampoule (0,5mg) 1mL	1mL / 1 Ampoule	Atropine sulphate	Antidote against organophosphate gases
Atropine sulphate ampoule (1mg) 1mL	1mL / 1 Ampoule	Atropine sulphate	Antidote against organophosphate gases
Automatic Atropine Injector 2mL	2mL / 1 Autoinjector	Atropine sulphate, Obidoxime HCl	Antidote against organophosphate gases
Sodium Nitrite Ampoule 10mL	10mL / 1 Ampoule	Sodium Nitrite	Antidote against cyanide gases
Sodium Thiosulphate Ampoule I 10mL	10mL / 1 Ampoule	Sodyum Thiosulphate	Antidote against cyanide gases
Potassium Iodide Tablet	10 Tablets	Potassium Iodide	Against nuclear accidents and weapons
Pyridostigmine Bromide Tablet	21 Tablets	Prydostigmine Bromide	Antidote against organophosphate gases
Decontamination Powder 50g	50g Tube	Aluminum Silicate	Used externally agianst chemical gases

# MOND PHARMACEUTICAL FACTORY DIRECTORATE

GENERAL USE			
PRODUCT NAME	PACKAGING	ACTIVE INGREDIENT	INTENDED USE
Orgripal Capsule	16 Capsules	Paracetamol	Antiflu
		Oxolamine Citrate	
		Chlorpheniramine Maleic	
Orpermanganat Tablet	20 Tablets	Potassium Permanganate	Antiseptic
Hydroxychloroquine Tablet	20 Tablets	Hydroxychloroquine sulphate	Antimalarial
Etoksol Solution	1000mL	Ethyl alcohol, Hydrogen Peroxide, Glycerine	Disinfectant
Etoksol Solution	100m	Ethyl alcohol, Hydrogen Peroxide, Glycerine	Disinfectant
Ortikon Solution (Plastic Bottle) 1000mL	1000mL Bottle	Polyvinyl Pyrrolidone iode	Antiseptic
Ortikon Solution (Plastic Bottle) 100mL	100mL Bottle	Polyvinyl Pyrrolidone iode	Antiseptic
Ortikon Solution (Plastic Bottle) 50mL	50mL Bottle	Polyvinyl Pyrrolidone iode	Antiseptic
Hydrogen peroxide 100mL	100mL Bottle	Hyrogen Peroxide	Antiseptic
Benzalkonium Solution 100mL	100mL Bottle	Benzalkonium Chloride	Disinfectant
Ayko Talc Powder 50g	50g Bottle	Salicylic acid	Antimycotic
		Boric acid	
		Undecylenic acid	

BANDAGE AND DRESSING MATERIALS		
PRODUCT NAME	PACKAGING	INTENDED USE
Sterile Wound Dressing (20x20cm)	1 item	Dressing
Sterile Wound Dressing (30x30cm)	1 item	Dressing
Non-sterile Wound Dressing (20x20cm)	1 item	Dressing
Non-sterile Wound Dressing (30x30cm)	1 item	Dressing
Non-sterile Wound Dressing (40x40cm)	1 item	Dressing
Gauze Bandage (3x0,05m)	1 item	Dressing and stabilizing
Gauze Bandage (3x0,1m)	1 item	Dressing and stabilizing
First Aid Field Bandage	1 item	Stabilizing and antibleeding

# MoND PHARMACEUTICAL FACTORY DIRECTORATE

## TABLETS

ORPERMANGANAT TABLET



HYDROXYCHLOROQUINE TABLET



## CAPSULE

ORGRIPAL CAPSULE



## SOLUTIONS

ETOKSOL SOLUTION 1000ML



ETOKSOL SOLUTION 100ML



BENZALKONIUM SOLUTION 100ML



HYDROGEN PEROXIDE 100ML



ORTIKON SOLUTION (PLASTIC BOTTLE) 1000ML, 100ML AND 50ML



# MOND PHARMACEUTICAL FACTORY DIRECTORATE

## POWDER

■ AYKO TALC POWDER 50G



## CAMPAIGN AND EXERCISE EQUIPMENTS

■ CAMOUFLAGE PAINT 20G



HALAZONE TABLET



SODIUM CHLORIDE TABLET ■



## CBRN ANTIDOTES

■ ATROPINE AUTOINJECTOR 2ML



DECONTAMINATION POWDER 50G



SODIUM THIOSULPHATE AMPOULE 10ML ■



SODIUM NITRITE AMPOULE 10ML ■

■ ATROPINE SULPHATE 1MG AND 0,5MG AMPOULE 1ML



POTASSIUM IODIDE TABLET



PYRIDOSTIGMIE BROMIDE TABLET ■



# MoND PHARMACEUTICAL FACTORY DIRECTORATE

## BANDAGE AND DRESSING MATERIALS

■ STERILE WOUND DRESSING (20X20CM) AND (30X30CM)



FIRST AID FIELD BANDAGE



■ GAUZE BANDAGE (3X0,05 M)



GAUZE BANDAGE (3X0,1 M)



■ NON-STERILE WOUND DRESSING (40X40CM)



NON-STERILE WOUND DRESSING (30X30CM)



NON-STERILE WOUND DRESSING (20X20CM)







# GENERAL DIRECTORATE OF NAVAL SHIPYARDS



## MISSION AND RESPONSIBILITIES

In order to keep the operational readiness level of the Naval Forces Command at its highest level, GDNS carries out repair, modification, modernization, construction activities and ensures timely procurement of materials and services.

GDNS manages and coordinates technical administrative activities of the shipyards, develops new business models to evaluate the idle capacities of shipyards, makes necessary commercial initiatives for this purpose, and carries out activities to enhance their capabilities.

GDNS is also responsible for managing and coordinating the activities to find out domestic sources for the materials used in the maintenance, repair and modernization of the systems used by the Navy.

### MISSION

To be a center of knowledge and experience in all activities from design to construction of national naval platforms and to produce high value added products.

### VISION

In order to realize domestic production at high standards in the naval defence industry, using the national technology and facilities to the maximum extent.



## NAVAL SHIPYARDS

### GÖLCÜK NAVAL SHIPYARD COMMAND

- Submarine construction, surface vessel and submarine repair and modernization,
- Maintenance and repairs of a total of 88 war ships, submarines and marine vessels and 1,200 associated systems

### İSTANBUL NAVAL SHIPYARD COMMAND

- Warship design, construction, repair and modernization,
- Maintenance and repairs of a total of 168 war ships and marine vessels and 1,050 associated systems

### İZMİR NAVAL SHIPYARD COMMAND

- Maintenance/repair of naval land unit's weapons, electronic, communication systems.
- Maintenance and repair of a total of 79 war ships and marine vessels and 710 associated systems



GÖLCÜK



İSTANBUL



İZMİR

## NAVAL SHIPYARDS

The technical capability in our shipyards is the most important element that enables our warships to perform their duties 7/24 at the highest operational readiness level.

### TURKEY

Is one of the 10 countries that has the capability to design and construct warships in the world.

### GÖLCÜK NAVAL SHIPYARD COMMAND

Is one of 16 shipyards in the world manufacturing Submarines. GDNS has the following capabilities;

- Submarine Battery Production
- Sonar and Various Type of Radar Maintenance
- Gas Turbine Maintenance/Repair and Inspection
- 127 mm Naval Cannon Maintenance and Repair
- Paint Production
- Helicopter Platform Certification
- Underwater Repair Capability



## NAVAL SHIPYARDS

### İSTANBUL NAVAL SHIPYARD COMMAND

One of the 5 shipyards in the world capable of building minehunter vessel and their modernization and maintenance with non-magnetic materials.

- Manufacturer Level Maintenance and Repair of 20/35/40/76 mm Naval Cannons
- Production of Fixed Wing Angle Propellers
- Diesel Engine Test Station
- Cylinder Test Station
- Non-Destructive Testing Capability



## NAVAL SHIPYARDS

### İZMİR NAVAL SHIPYARD COMMAND

- Underwater Repair
- Various Type of Radar Maintenance
- Various Type of Naval Cannons Repair and Maintenance



## ACCOMPLISHED ACTIVITIES

In addition to maintenance and modernization activities, GDNS has successfully completed more than 500 naval vessel construction activities, including frigates, corvettes, submarines, fast attack boats, mine hunters, coast guard boats, logistic support vessels and floating docks since 1937.

FRIGATES



SUBMARINES



FLOATING DOCKS



LOGISTIC SUPPORT VESSELS



## ACCOMPLISHED ACTIVITIES

The frigates named TCG FATİH, TCG YILDIRIM, TCG ORUÇ REİS and TCG KEMAL REİS were designed by German Blohm und Voss and built in Gölcük Naval Shipyard Command.

YAVUZ CLASS FRIGATES

TCG YILDIRIM ■



YAVUZ CLASS FRIGATES

TCG FATİH ■



BARBAROS CLASS FRIGATES

TCG ORUÇ REİS ■



BARBAROS CLASS FRIGATES

TCG KEMAL REİS ■





## ACCOMPLISHED ACTIVITIES

The building of the first fast attack boat building started in İstanbul Naval Shipyard Command in 1975 and since then, 13 fast attack boats were built by GNDS.

### FAST ATTACK BOATS



### COAST GUARD BOATS

GNDS has built 20 coast guard boats since 2005. Two of the boats were delivered to Northern Cyprus Turkish Republic.



## ACCOMPLISHED ACTIVITIES

Gölcük Naval Shipyard Command is one of the 16 shipyards in the world which can built submarines. Eleven submarines were built in Gölcük Naval Shipyard Command using the HDW design.

### AY CLASS

TCG YILDIRAY  
TCG DOĞANAY  
TCG DOLUNAY

### AY CLASS



### PREVEZE CLASS

TCG PREVEZE  
TCG SAKARYA  
TCG 18 MART  
TCG ANAFARTALAR

### PREVEZE CLASS



### GÜR CLASS

TCG GÜR  
TCG ÇANAKKALE  
TCG BURAK REİS  
TCG 1. İNÖNÜ

### GÜR CLASS



## ACCOMPLISHED ACTIVITIES

Istanbul Naval Shipyard Command has accomplished building of five AYDIN Class Mine Hunter Coastal Vessels, five KILIÇ Class Fast Attack Boats and 14 of 80-90 Class Coast Guard Boats.



## MİLGEM (NATIONAL SHIP) PROJECT

It is the unique project that has been completed on aimed performance within planned budget and time among the other warship building projects in recent years.

The design of MİLGEM is secured and patented by Ministry of National Defence of the Republic of Turkey.

The first ship (TCG HEYBELİADA) was commissioned in 2011, the second ship (TCG BÜYÜKADA) in 2013, the third ship (TCG BURGAZADA) in 2018 and the fourth ship (TCG KINALIADA) is in 2019.

**% 100**  
NATIONAL DESIGN



## MİLGEM 1 - HEYBELİADA (F 511)



## MİLGEM 2 - BÜYÜKADA (F 512)



## MİLGEM 3 - BURGAZADA (F 513)

It was launched upon its completion 3 months prior to the estimated date on the contract in June 2016, The BURGAZADA corvette was delivered to Turkish Naval Forces in İstanbul Naval Shipyard Command on November 4, 2018.



## MİLGEM 4 - KINALIADA (F 514)

TCG KINALIADA (F-514) was delivered to the Naval Forces Command on September 29/2019, nearly 9 months before the contract schedule.





## ACCOMPLISHED ACTIVITIES

### 10.000 TONs FLOATING DRY DOCK (HAVUZ-14) PROJECT

General Directorate of Naval Shipyards and ASFAT signed a contract on 2 August 2018, for the construction of a floating dry dock. The floating dock was accepted on February 24, 2020 and is operational now in İzmir Naval Shipyard.



## ON-GOING ACTIVITIES

### MİLGEM 5 - İSTANBUL (F 515)

İstanbul Frigate was launched as a continuation of MİLGEM Class Corvettes. In the construction of the ship, the design of MİLGEM Class Corvettes and knowledge gained by our national defence industry infrastructure is used.

'İ' Class Frigate (İSTANBUL F-515)'s first welding was carried out by President Recep Tayyip Erdoğan on 3<sup>rd</sup> of July 2017. The Launch Ceremony of İSTANBUL, the first ship of the 'İ' Class Frigate project, was held on 23 January 2021 at the İstanbul Shipyard Command with the presence of our President. Delivery of the ship to Navy is planned for September 2023.



## ON-GOING ACTIVITIES

### NEW TYPE SUBMARINE PROJECT

The project for the construction of submarines with air independent propulsion (AIP) in the Gölcük Naval Shipyard Command has been started on 22 June 2011.

Construction activities of the first submarine of the project, TCG PİRİ REİS, has started in 2015. PİRİ REİS was successfully launched on 22 March 2021. The ship will be delivered to Navy in 2022.

The shipbuilding of the follow-on submarines is being carried out as planned. The last ship is planned to be delivered to Navy in 2026.

### REİS CLASS SUBMARINES

PİRİ REİS (S-330)

HIZIR REİS (S-331)

MURAT REİS (S-332)

AYDIN REİS (S-333)

SEYDİ ALİ REİS (S-334)

SELMAN REİS (S-335)



## ON-GOING ACTIVITIES

### MİLGEM CORVETTE PROJECT FOR PAKISTAN NAVY

As an extension of MİLGEM Project, ASFAT was awarded the contract on 5 July 2018 for the construction of 4 MİLGEM Class Corvettes for the Pakistan Navy Forces.

Two of the 4 Corvettes planned to be produced will be built at our İstanbul Shipyard Command and the other two will be built in Karachi/Pakistan.

Within the scope of the protocol signed between İstanbul Shipyard Command and ASFAT, the construction of the first ship started on January 10, 2020 and the first laying phase of the second ship of the project was carried out on October 25, 2020 at the Karachi Shipyard & Engineering Works (KS&EW) with the participation of Minister of National Defence of the Republic of Turkey and Minister of Defence Production of Government of Pakistan.

The Steel Cutting Ceremony of Pakistan MİLGEM Project's 3<sup>rd</sup> Ship was held on 23 January 2021 at TGM İstanbul Shipyard Command with the presence of President Recep Tayyip Erdoğan.

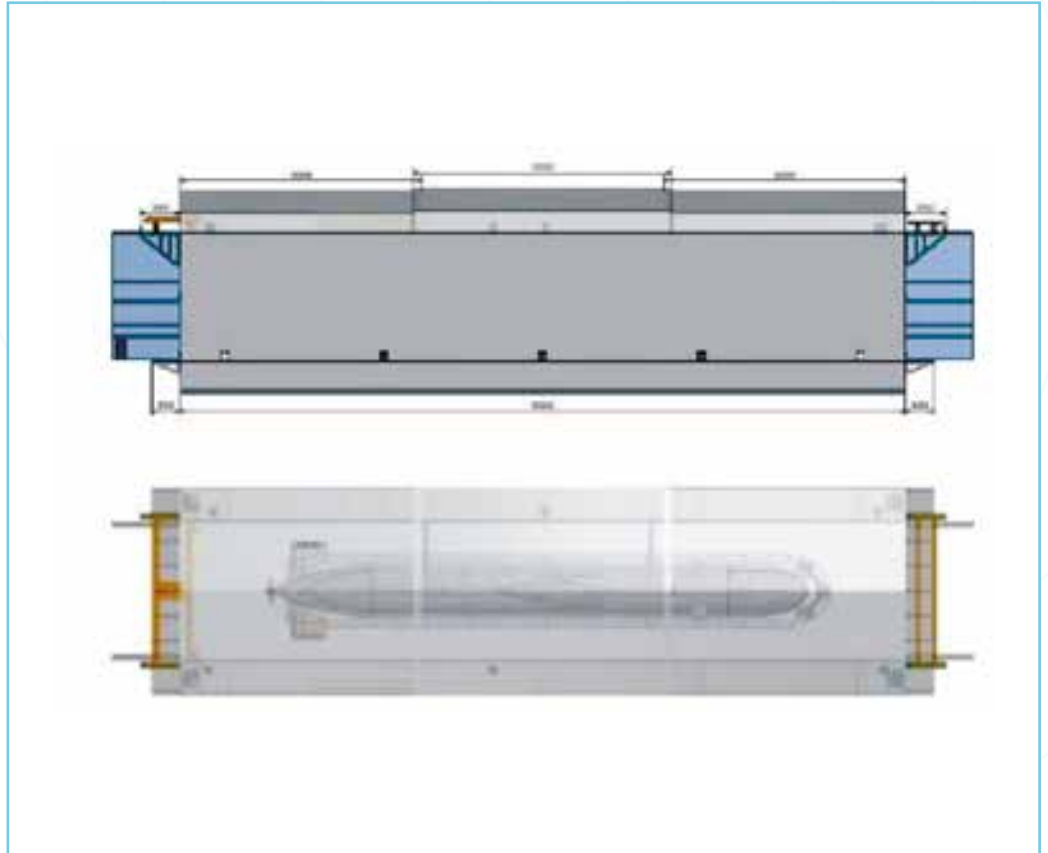


## ON-GOING ACTIVITIES

### 3.000 TONS SUBMARINE FLOATING DRY DOCK PROJECT

Floating Dry Dock Project Procurement Contract was signed on 17 December 2019 between General Directorate of Naval Shipyards and ASFAT.

The Steel Cutting Ceremony of the Project was held on August 18, 2020 and the delivery of the floating dock is scheduled to be on April 2022.



## PLANNED ACTIVITIES

### OFFSHORE PATROL VESSEL CONSTRUCTION

For the construction of two OPV's, the contract was signed on 26 November 2020 between General Directorate of Naval Shipyards and ASFAT. The construction will be done at the İstanbul Naval Shipyard Command. The delivery of both vessels are scheduled to be in 2024 and there fore simultaneous construction activities will be carried out.



## PLANNED ACTIVITIES

### NATIONAL SUBMARINE PROJECT (MILDEN)

In order to design and built submarines with domestic facilities and capabilities, National Submarine (MILDEN) Design Project Office was established in Gölcük Naval Shipyard Command. MILDEN design is being carried out and first ship is planned to be delivered to the Navy in 2030's.



# NOTES

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