TRANSPORTATION AERIAL, MARINE AND GROUND

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Fajr Aviation & Composites industry

Aircraft Design Center

Achieving DOA certification from the Iranian Civil Aviation Organization, the Design office of FAJR Aviation and Composites Industry can design and apply changes on aerial vehicles based on international standards and regulations.
FAJR Design Office includes General Design, Avionic, Structure, System, Propulsion, and Aerodynamic groups. The Design Office, under the integral structure, resulted over the years and due to the accomplishment of a variety of projects, has the capability of controlling design cycles and can accomplish the process of putting an idea into a product based on Part-23 standards. Technology office and CAD group of FAJR utilizing new methods in the documentation process make a revolution in providing and supporting production documents.

Design Assurance System Capabilities

A successful leader industry with an approach to increase efficiency and reconcile strategies and goals with the establishment of quality management systems and standardizing products such as:
Design and manufacturing based on aviation standards, the establishment of international quality control systems, the establishment of aviation quality control systems to obtain design and production approvals.

Standards which have been achieved by FACI include

TC, POA, DOA, ADS578, ISO10002, ISO100 15, ISO14001, OHSAS18001, ISO9001

Aerial services, maintenance and support

Aerial services

- Pilot training and sport aviation
- Performing special flights including surveillance and patrolling, air show, advertising, aerial photography and research
- Performing special tests such as installing new systems and equipment including navigation equipment, telecommunication systems, and radio and so on in addition to applying minor changes based on DOA certification

Maintenance

Performing complete repairing services in avionics, system, and structure of composite airplanes in light and ultra-light classes like performing periodic checks and overhaul Through approved specialists from the Iranian Civil Aviation Organization.

Light Aircraft Fajr-20

SPECIFICATIOS	
High wing	
Cockpit two seat side-by-side	Manufactured by advanced composites technology
Large space cockpit & over 300° visibility	Dual controls
Low stalling speed	Single engine propeller driven aircraft
Fuel capacity 130 liters	With capability of opening doors for photography

Engime & Propeller	
ENGINE	
Rotax 912	Liquid/air cooled, 100hp, leaded or unleaded automotive fuel
PROPELLER	
Three bladed, ground adjustable	

TYPE OF USE
Roads Control, Private
Postal purposes
Aerial photography
Pilot primary trainer
Boarder & Coastal patrol, Search & Rescue

PERFORMANCE		
Max. Speed (SL)	225.3 (km/h)	121.7 (knots)
Cruising Speed at 75% power (ISA)	201.1 (km/h)	108.6 (knots
Service Ceiling	3657.6 (m)	12000 (ft)
Rate of Cimb	243.8 (m/min)	800(ft/min)
Take-off Roll	109.7 (m)	360 (ft)
Landing Roll	137.2 (m)	450 (ft)
Stall Speed	48.3 (km/h)	26.1 (knots)
Range	1481.6 (km)	800 (nm)
Endurance	7.2 (hours)	

OVERALL DIMENSIONS & GEOMETRY		
	BS	**SI**
Length	23.26 (ft)	7.09 (m)
Height	7.58 (ft)	2.31 (m)
Cockpit Height	3.77 (ft)	1.15 (m)
Cockpit Width	3.67 (ft)	1.12 (m)
Wing Span	28.21 (ft)	8.6 (m)
Wing Area	124.97 (ft2)	11.61 (m")

Light Aircraft Fajr-3

Engine & Propeller
ENGINE
One reciprocating engine with a direct drive, six cylinder fuel injection, horizontally opposed, air cooled and fuel aviation grade 100/100 LL
PROPELLER
Three bladed, single acting, fully hydraulically controlled, constant speed, variable pitch

Performance & Fix/Retract		
Performance	**Fix/Retract**	
Max. Cruise Speed(SL)	274/300 (km/h)	148/162 (knots)
Cruise Speed at75%power(ISA)	241/293 (km/h)	130/158 (knots)
Service Ceiling	5182/5486 (m)	17000/18000 (ft)
Rate of Climb	280/314 (m/min)	920/1030 (ft/min)
Take - Off Distance to 50 ft	540 (m)	1640 (ft)
Landing Distance from 50 ft	490 (m)	1608 (ft)
Stall Loading	104 (km/h)	56 (knots)
Range	926/1174 (km)	500/634 (nm)
Endurance	5.5 (hours)	

OVERALL DIMENSIONS & GEOMETRY		
	BS	**SI**
Length	26.48 (ft)	8.07 (m)
Height	10.01 (ft)	3.05 (m)
Cabin Length	7.15 (ft)	2.18 (m)
Cabin Height	5.02 (ft)	1.53 (m)
Cabin Width	4.10 (ft)	1.25 (m)
Wing Span	34.45 (ft)	10.5 (m)
Wing Area	150.9 (ft)	14 (m2)

WEIGHT AND LOADING		
	BS	**SI**
Empty Weight	2425 (lb)	1100 (kg)
Maximum Take-Off Weight	3483 (lb)	1580 (kg)
Fuel Capacity	280 (lit)	
Wing Loading	112.8 (kg/m2)	
Power Loading	7.85 (kw/kg)	

M2D UAV System

INTRODUCTION

M2D is an unmanned air vehicle (UAV) system, which is designed to perform surveillance and reconnaissance purposes.

This system can carry out different missions such as aerial photography, real-time video imaging and battle area surveillance at a short distance covering various targets on surfaces.

The users carry out reconnaissance and surveillance missions with the capability to shift from remote control to autonomous flight and vice versa. This UAV system is designed to operate in a hostile electromagnetic environment as its airframe is entirely made of composite materials. The infrared signature is minimized since the aerodynamic cover masks the engine, and the pushing propeller disperses the exhaust.

The M2D can fly in automatic mode if communications and radio links are lost or purposely terminated. It will continue pre-programmed flight plans until the permission is terminated or the communication is reestablished.

The pre-programmed parameters can be changed at any time during the mission.

Due to its real-time data transmission capability, it is especially useful in

- Battlefield
- Detecting low - level intruders

MAIN SPECIFICATIONS

Dimension & Weights	
Length	2.9 m
Wing span	3.8 m
Maximum takeoff weight	105 – 107 kg
Payload weight	5 Kg

Flight Performances	
Maximum speed	180 km/h
Cruise speed	150 km/h
Ceiling	11000 ft
Flight endurance	4 hours
Operational radius	150 km

SYSTEM CONFIGURATION

M2D UAV system is consisted of subsystems as following:

1- Airplane
2- Pneumatic launcher or wheels
3- Ground control station
4- Payload
5- Ground support equipment

Lighter Than Air System (Odje 15B)

A Tactical, Less Expensive, Rapid Deployment Balloon System

MISSION: Worldwide military/security operations reemphasize the need for a low cost, responsive, and mobile system to elevate electronic payloads up to 500 meters altitude. Military missions include long term surveillance around base camps, and communications relay to unmanned ground /air vehicles, to dispersed security posts and convoys without using scarce satellite bandwidth. Critical needs include establishing temporary communications capability in emergencies such as terrorist attacks or natural disasters. Law enforcement and border security units need overhead surveillance of border crossings, airports, VIP events, etc. that are both less costly and intrusive than helicopters while providing around the clock coverage. The most efficient means to meet these requirements is a low cost, mobile aerostat system. However, traditional aerostats are large, manpower-intensive, and vulnerable to adverse weather conditions. We have developed the Lightweight Aerostat System named Odje15B that removes these limitations, creating a very cost-effective system.
LAS Concept: The Lightweight Aerostat System (LAS) consists of a small aerostat with aerodynamic list surfaces mounted on a trailer Carrier. The LAS blimp can be flown at several hundred to thousand feet altitude to provide coverage 24 hours a day for a week or more without maintenance or downtime. Operating and maintenance cost is a fraction of using aircraft or UAVs to lift surveillance or relay payloads. LAS surveillance versions at 100 to 500 meters can cover a radius of up to 35 Km, depending upon terrain. Off the shelf, payloads include stabilized camera and IR systems, while radar, chemical detection, and communication equipment can be adapted to the system.

Odje15B Advantages:

- Good Ground Mobility.
- Long Mission Duration.
- Low Production Cost.
- Very Low Manpower.
- Needed Lightly-Trained Crews
- Minimal Logistics
- Cost-Effective and Mission Effective
- Very Low Deployment Requirements.

Balloon Usages:

- Aerial Photography or Aerial Imagery
- Aerial surveillance, as an aerial platform for a radar
- Acoustic Detectors
- Aerial Sampling of Power Plants, Explosions,
- Aerial radar Reflector at sea
- Communications relay
- Civil and military use

SYSTEM COMPOSITION

- 1 Air Vehicle or Balloon Odje 15
- 1 Ground control stations (GCS)
- 1 Payload (optional)
- 1 Launch & Retrieve System
- 1 Helium Recovery System
- 1 Set spare parts.

Under Supervision Helicopter Types

Medium Helicopters

Bell 205

Bell 212

Bell 412

Bell 214

Light Helicopters

BO-105

Bell 206

R 44

Heavy Helicopters

SH-3D

RH-53D

MI-171

CH-47C

Services

Dynamic Parts Repair and Overhaul

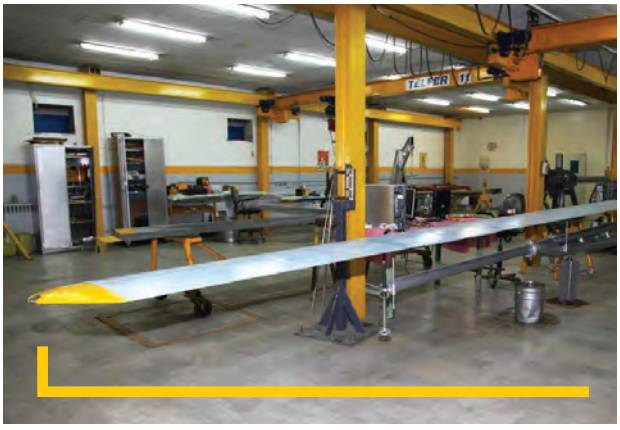
Rotary parts of helicopter such as Mast, Hub, M/R head and T/R head, being repaired and overhauled in dynamic shop

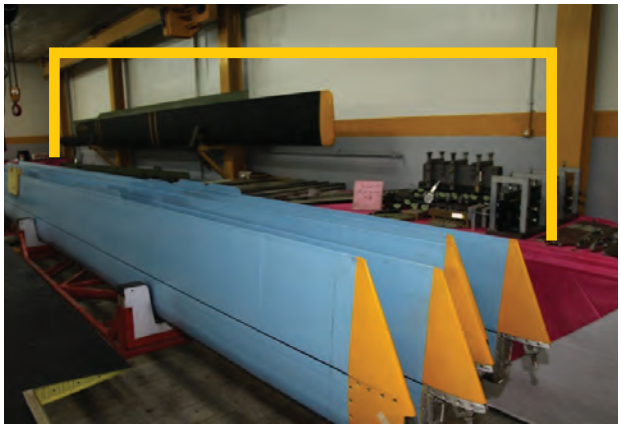
Transmission Repair and Overhaul

In transmission shop, helicopter transmission systems such as clutch, main gearbox 42 degree and main gearbox 90 degree being overhauled and ready for installation after testing by sophisticated equipment.

Blade Repair

In blade shop, damaged blades are being passed and necessary actions for repair, re-coloring and static balance are being done according to pertinent procedure and quality standards.





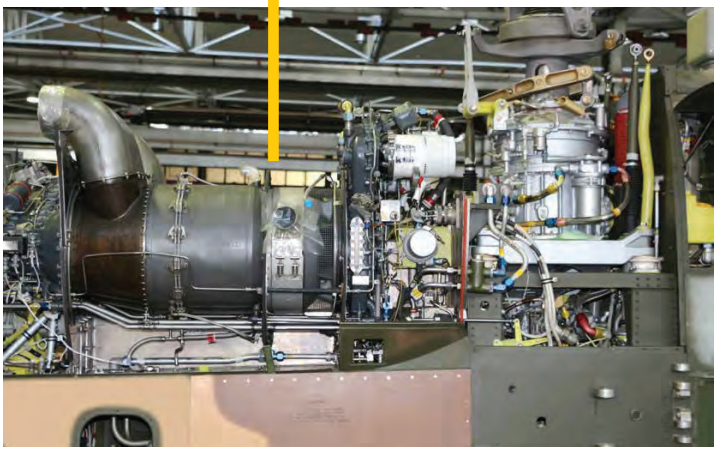
Hydraulic Systems Repair and Overhaul

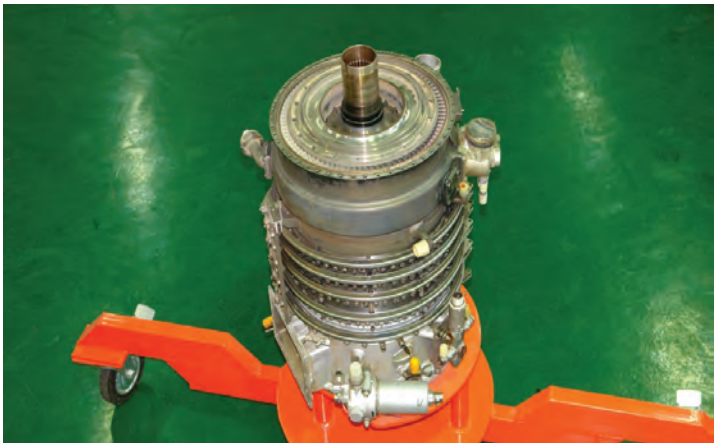
In hydraulic shop, all pneumatic, hydraulic and fuel Systems of different helicopters are being repaired and overhauled according to sophisticated standards.

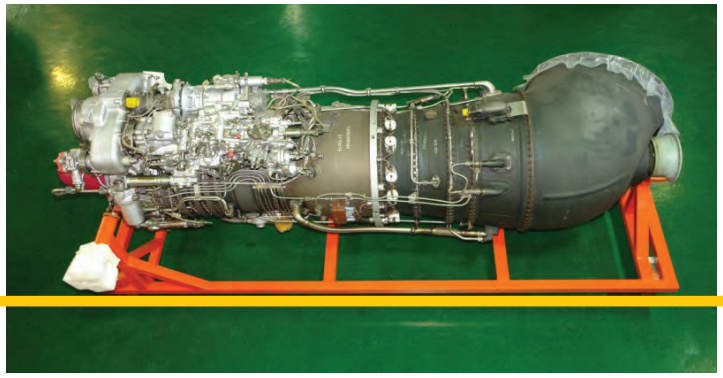
Helicopter Assembly and Disassembly

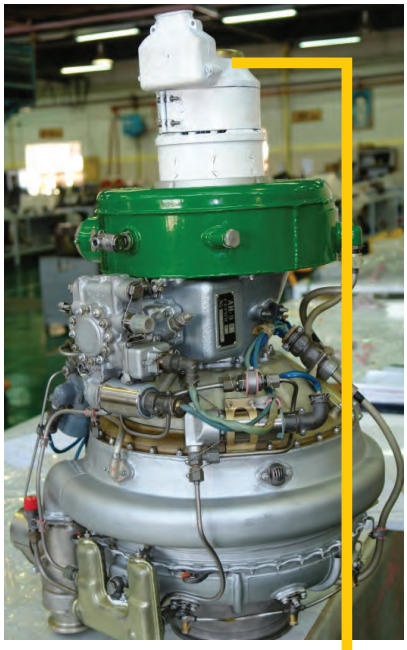
Helicopter Engine Repair

Engine shop is one of the most important shops, in which repairing, fulfillment of service bulletin in intermediate level and testing different types of turbo shaft engines are carried out.









Helicopter General and Specialized Training Courses

training center provides theoretical and practical MRO training courses for different fields of skills in elementary, intermediate, and advanced levels. This center could cover professional training for more than 1000 trainees each year and issue related certificates for local and foreign trainees.

Measurement and Calibration Services

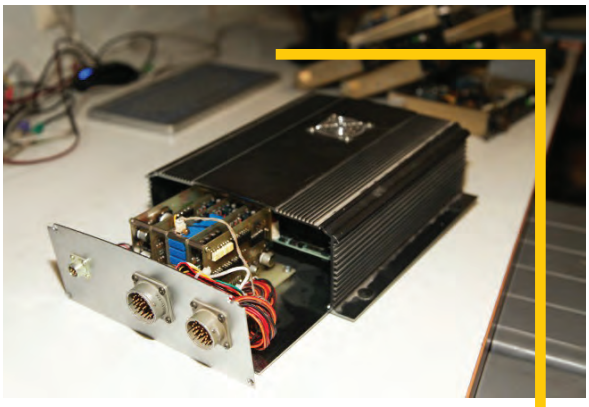
-Calibrationofmeasuringequipment,temperature humidityandtemperaturesensors
-Repair and calibration of electrical and electro avionic test equipment
-Calibration of various test equipment and dimension measurement
-Calibration of standard reference scales, weights and torque wrenches
-Metal and non-metal, chemical and mechanical tests and analysis
-Chemical kits and test equipment Calibration
-Nondestructive tests

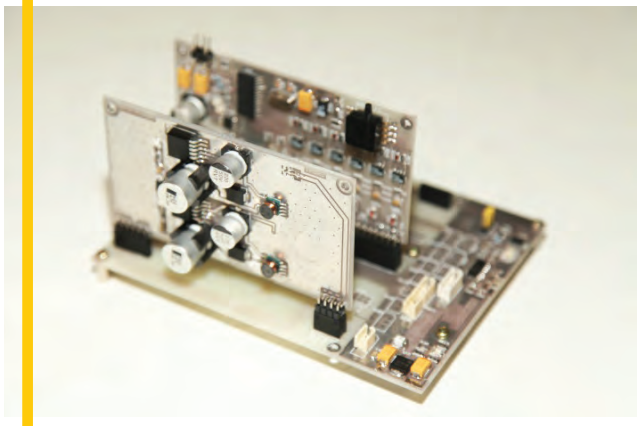
Manufacturing Services

-Manufacturing many types of fuselage, components, systems, cockpit, and tail boom of light helicopter.
-Manufacturing and forming many types of Aluminum, Titanium, and cress components.
-Manufacturing all types of Jig and fixtures
-Rewiring and manufacturing wiring tree of light and heavy helicopters.
-Manufacturing sandwich panels for light and heavy helicopters
-Manufacturing composite components
-Forming and manufacturing different types of glass
-Precision machinery operation.
-Fabricating all types of shop mold

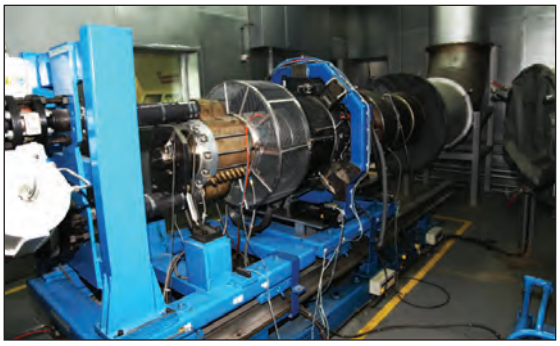
Electro Avionic Systems Repair

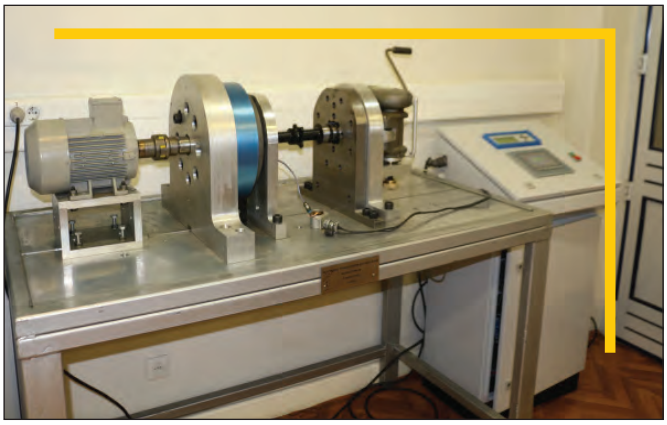
- Conducting different kinds of repair and overhaul on communication, navigation , and AFC systems, electronic equipment and instruments.
Consultancy, start-up and maintenance, repair of different HF, VHF, UHF, and GPS systems.
FDAU (Flight Data Acquisition Unit) and flight control
Helicopter MDF system





Aviation Parts and Component Testers





Ground Support Equipment

-Auxiliary Power Unit (APU)
-Ground Handling Wheel
-MI-helicopters brake test bench
-Jet engine corrosion control cart
-Nitrogen servicing unit
-Helicopter maintenance platforms
-Hydraulic jack (7.5 & 12 Tones)

Helicopter EMS Kit




SABA 248 (in process)

Desing Services & Aviation Engineering

1. Design of hydraulic systems and related accessories as well as conduction of operational tests of hydraulic system circuit on different types of aircraft
2. Technological operations to manufacture, assemble and conduct operational tests of hydraulic system circuits
3. Design, layout, and a load of mechanisms considering the design requirements and rules as well as preparation of production and test documentation
4. Design of test stand and iron bird for the required tests

Design capabilities of landing gear group:

1. Design and dynamic simulation of landing gears of different types of aircraft, considering their missions
2. Kinematic and kinetic analyses of landing gears, considering aircraft landing speed
3. Loading and strength analyses of landing gears, considering the speed of sink
4. Design of all components required in landing gears
5. Design of Iron Bird required for installing landing gears
6. Conduction of certification tests for different types of landing gears
7. Design and manufacture of stands for testing landing gears
8. Technological operations for manufacturing, assembling, conducting operational and static tests and extending the landing gear

Cabin pressure control system:

- Design of cabin pressure control system for all types of flying vehicles
- Design and manufacture of test stands required for:
- Adjustment of cabin pressure during leakage and strength tests of aircraft structure
- Emulation of performance of a pressure control system for evaluation of system design reliability
- Emulation of static pressure in flight
- Operational tests of system items
- Software emulation of performance of cabin pressure control system

Desing Services & Aviation Engineering

• Analysis and calculations of cabin heat and cool loads for a flying vehicle
• Design of different types of air condition system for a flying vehicle, considering its mission
• Design of some vendor items used in aircraft air condition system, such as heat exchanger, condenser and re-heater
• Design and thermodynamic analysis of air condition cycles with the use of HYSIS software
• Analysis of internal currents in pipes, ducts, exchangers, valves, cooling turbine and two-phase currents in air dryer
• Conduction of ground and flight tests on different types of air condition system
• Receiving design approvals for the systems and items used in the systems

Ice protection system

• Explaining the design methodology and systematic investigation on need or needless of a flying vehicle to the anti-ice system
• Analysis of the airfoil with use of expert software such as FENSAP ICE in ice emulating and in determining the impact limitation of the water drops on the wing and other critical sections of aircraft, digital analysis of investigation on aerodynamic effects of ice formation on the aerodynamic performance of a flying vehicle
• The digital emulation of the ice protection systems of a flying vehicle
• Design of ice protection systems (pneumatic, electric and spray fluids)
• Conduction of some laboratory and wind tunnel tests on ice protection systems

Test and calibration laboratories

Introduction:
As an independent quality center, the test and calibration laboratories take the responsibility of testing parts, aggregates, and materials as well as calibrating the equipment of measurement in the aviation industry, based on the aviation requirements and regulations and ISO/ IEC 17025 as well.

Center of standardization and quality development
Test and calibration laboratory complexes

Material Testing
- Metal
- Chemical (portable and fixed)
- Mechanical
- Structure and metallography
- Identification of material
- Non-metallic (Polymer, Compounds, adhesive and sealant)
- Chemical
- Physical
- Mechanical
- Identification of material
- Fuel and lubricants
- Chemical
- Physical
- Paints and organic coats
- Structure and chemical microanalysis (EDX)
- Galvanic solutions and wastewater
- Production of polymer adhesive coating (MASKANT) and sealant

Non-Destructive
- Ultrasonic UT
- Fluoroscopic FT
- Radiography RT
- Acoustic AT
- Eddy current

Calibration and Repairs
- Dimensional (types of caliper, micrometer, length measuring tools, etc.)
- Electronic (electronic and radio, time, etc.)
- Mechanical (pressure, temperature, volume, weight, humidity, force, torque, compression)
- Chemical and physical equipment (different types of spectrophotometer, viscometer, hardness gauge, tensile and copression units, hardness test blocks, etc.)

Metrology and Dimensional Check
- Ultrasonic UT
- Fluoroscopic FT
- Radiography RT
- Acoustic AT
- Eddy current

Technical Consultant and Training
- Establishment of laboratory and management quality systems
- Improvement of production methods
- Standardization
- Identification and standardization of licensed chemical

Various Laboratory Services

Certifications:

• Competence Approval, ISO/IEC 17025, received from Iran National Competence Approval and Parsian Competence Approval Institute (more than 13 years)

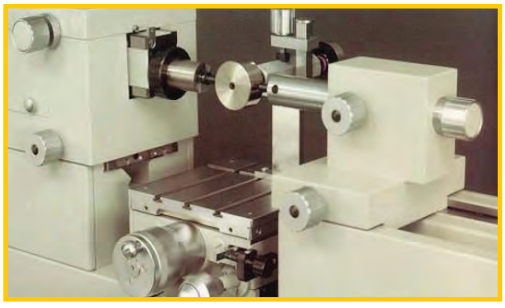
• Accreditation laboratory of Isfahan Standard Administration in the field of fuel and oil products
• Top-level laboratory of Isfahan Standard Administration in 2016
• Three-star organizational excellence award

Repair of laboratory equipment

Metrology

Mechanical calibration services

Mechanical calibration services



Dimensional calibration services

Chemical and physical calibration services

Electric calibration services

Dimensional control

Tests of minerals and metallic materials

Tests of mechanical properties
of metallic materials

Tests of non-metallic materials
(fuels, aviation lubricants and oil products)

Tests of non-metallic materials
(polymers, glue and sealants)

Identification of non-metallic
materials and polymers

Analysis of elements in fuel and lubricant
Analysis of industrial water and water wastes
Analysis of impurities in aviation alloys

Structure, metallography, determination
of coating and fracture analysis

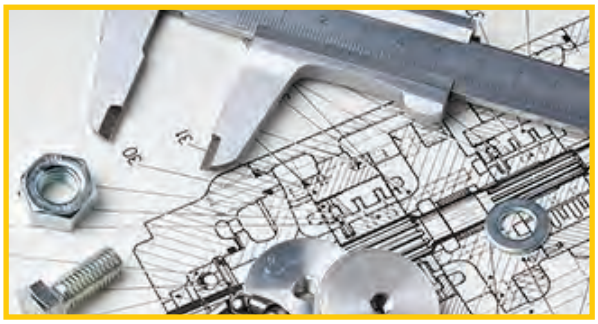
Tests of aviation paints and coats

- Non-Destructive Tests:
  Ultrasonic test
  Test with magnetic particles
  Eddy current and acoustic test

- Non-Destructive Tests:
  Fluoroscopic inspections with use of X-Ray and inspecting the deep defects
  Radiography and interpretation of film
  Inspection with penetrating liquids

- Localization of know-how and production of polysulfide two-component sealing for fuel tanks and internal and external surfaces applied in aviation and non-aviation industries, in accordance with MIL-S-8802

- Localization of know-how and production of polymer adhesive coating (MASKANTS) used in preparation of surfaces and electro-chemical coating



Reverse engineering, preparation of technical documents, consultant and training

Particle counting and determination of physical purity of aviation fuels and lubricants

Design, Development and Test Center of Aviation Systems

Integrating operational tests, ambient conditions and flight simulation for the first time in Iran, Design, Development and Test Center of Aviation Systems has been able to prepare the background for operational tests of aviation systems in different operational conditions, aimed at upgrading the quality level of domestic products. The Center has accordingly provided worthy services to other industries.

Acceleration test stand

Altitude test stand (vacuum)

High-temperature and vibration tests stand

Air condition test stand

fungus test stand

Hydraulic test stand

Instant acceleration, mechanical shock and vibration tests stand

Low-temperature, humidity and temperature shock tests stand

Salt fog test stand

Aircraft generator

Avionics

Designing, putting into operation, testing and submitting different upgraded electro-avionic systems for various aircraft (partial and general), based on the needs of airlines:

Due to its own organizational responsibility in integrating electro-avionic systems, Avionic Industry that has different certifications from CAO IRI, IDS, etc., has been able to put into execution the upgrade of avionics on various types of aircraft and helicopter and also design and upgrade the avionics system of aircrafts, based on the needs of customers.

Potential of repairing various electro-avionic parts:

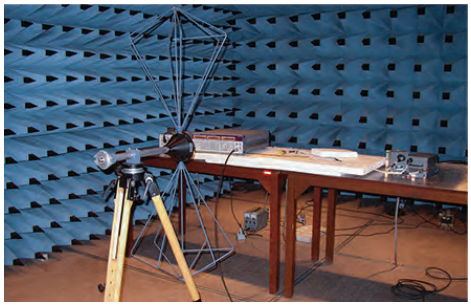
Having experienced repairing, testing and running different systems and aircraft types during last years and enjoying Form 1 in the field of aircraft lighting system and seat which scope can be increased; Avionics Industry is potentially able to repair the electro-avionic systems including electric, telecommunication, navigation, displays, etc.

Designing and manufacturing various testers,:

Having experienced designing, manufacturing and delivering tester of Protocol ARINC-429 to Aseman Airline as well as designing and manufacturing testers required for different aviation systems, Avionics Industry is potentially capable of designing and manufacturing various aviation testers, based on the requirements of the customers.

Designing and running the tests in ambient conditions:

Based on the present substructures as well as experiences made in various aviation projects, Avionics Industry can provide different tests in ambient conditions, in accordance with Do-160 and EMI/EMC tests, etc.



Produced aerodrome equipment

AIR CARGO CONTAINER (LD-3)

PALLET TRAILER

HYDRAULIC JACK

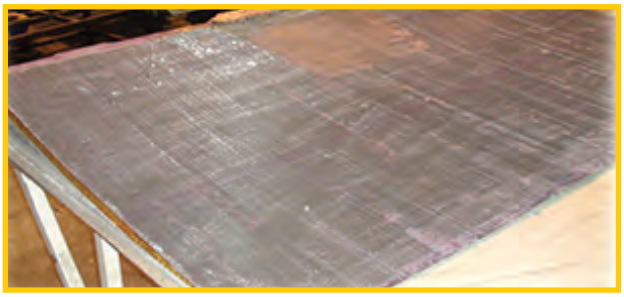
CONTAINER AND PALLET RACK

CONTAINER DOLLY

WING SUPPORT

Repairs and reconstruction

Reconstruction of Boeing-747 internal spoiler



Reconstruction of Boeing-747 internal spoiler

Reconstruction of Boeing-747 finalized spoiler

Redesign and reconstruction of cowling panel for Airbus engine

Windshields

Aviation Glass Windshields

IGP aircraft transparencies consist of several glass panes that are bonded together by polymer (PU) interlayer. The tempered or chemically reinforced glass is used in cockpit windows to withstand various mechanical and thermal stresses and bird impact. De-icing and demisting windows are provided by connection of heating elements (transparent conductive coating and wire-grids) and sensor through plugs, terminal blocks, or cables.
IGP has improved its products' optical qualities for all shapes of aircraft structures including flat, curved mono or multi-panes, monolithic or laminated according to the latest European standards.

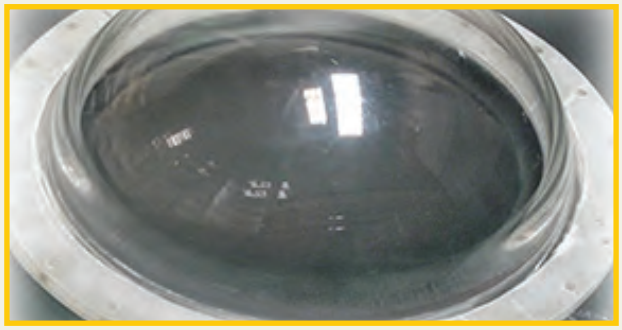
Features

Highly forward visibility, Superior optical quality, and less deflection.
Optimal compositions for high resistance to bird impacts.
No failures from localized heating by homogeneous heating of the glass whatever the shape.
Maximum adhesion between materials for increased resistance to delamination and extends service life.
Fully interchangeable and lower maintenance costs.
Better visibility in rain conditions by hydrophobic coating.

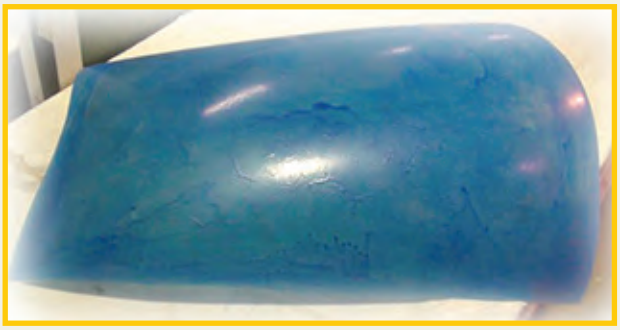
Production of Glass



Production of A/C passenger cabin glasses along with Form One



Bubble E Glass



Windshield

B747

Features and benefits

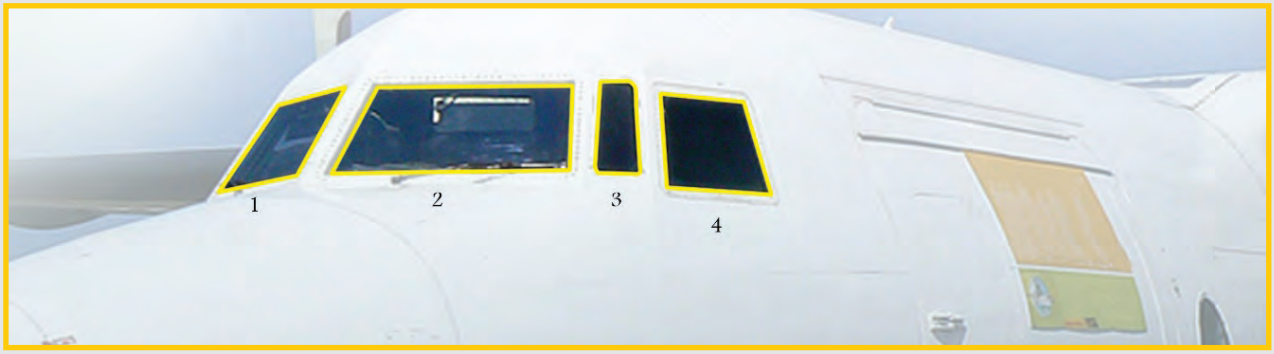
Windshield and window features and advantage	
Features	**Advantage**
Thermally Tempered Glass	• Chemical and abrasion resistance • High load-carrying capabilities
Urethane interlayer	• Provides maximum adhesion to glass for increased resistance to delamination and extends service life • Elasticity at low temperatures and reduce potential for cold chipping
Stretched-Acrylic Plies	• Lightweight • Repairable • Low cost
Superior Optical Quality	• Safety • Enhanced visibility
Full Interchangeability	• Reduced inventory and related costs • Ease of installation
Simplified Clamp Design	• Eases replacement

B737

Features and benefits

Windshield and window features and advantage	
Features	**Advantage**
Thermally Tempered Glass	• Chemical and abrasion resistance • High load-carrying capabilities
Stainless Steel Z-Retainer	• Permanent physical barrier protects sealant against moisture ingress
Superior Optical Quality	• Safety • Enhanced visibility
Full Interchangeability	• Reduced inventory and related costs • Ease of installation
Simplified Clamp Design	• Eases replacement

F27



Features and benefits

Windshield and window features and benefits

Features	Advantage
Thermally Tempered Glass	• Chemical and abrasion resistance • High load-carrying capabilities
All-Glass Design	• Chemical, abrasion, scratch resistance • Uniform thermal expansion for greater resistance to delamination • Better fit in the airframe
Urethane interlayer	• Provides maximum adhesion to glass for increased resistance to delamination and extends service life • Elasticity at low temperatures and reduce potential for cold chipping
Deice and defog heating System	• Full-coverage heating • Excellent heating uniformity • Optical clarity • No failures from localized heating • Graded heat zones
Stretched-Acrylic Plies	• Lightweight • Repairable • Low cost

FOKKER 100

Features and benefits

Windshield and window features and benefits	
Features	**Advantage**
Thermally Tempered Glass	• Chemical and abrasion resistance • High load-carrying capabilities
All-Glass Design	• Chemical, abrasion, scratch resistance • Uniform thermal expansion for greater resistance to delamination • Better fit in the airframe
Urethane interlayer	• Provides maximum adhesion to glass for increased resistance to delamination and extends service life • Elasticity at low temperatures and reduce potential for cold chipping
Deice and defog heating System	• Full-coverage heating • Excellent heating uniformity • Optical clarity • No failures from localized heating • Graded heat zones
Stretched-Acrylic Plies	• Lightweight • Repairable • Low cost

F33

Features and benefits

Windshield and window features and benefits	
Features	**Advantage**
Thermally Tempered Glass	• Chemical and abrasion resistance • High load-carrying capabilities
Stainless Steel Z-Retainer	• Permanent physical barrier protects sealant against moisture ingress
Stretched-Acrylic Plies	• Lightweight • Repairable • Low cost
Full Interchangeability	• Reduced inventory and related costs • Ease of installation
Robust Bus Bar System	• Improved interconnectivity with heating system coating • Relocated away from hump seal for better window visual inspection
Simplified Clamp Design	• Eases replacement

ANTONOV 140

Features and benefits

Windshield and window features and benefits

Features	Advantage
Thermally Tempered Glass	• Chemical, abrasion, scratch resistance • High load-carrying capabilities
Urethane interlayer	• Provides maximum adhesion to glass for increased resistance to delamination and extends service life • Elasticity at low temperatures and reduce potential for cold chipping
Stretched-Acrylic Plies	• Lightweight • Repairable • Low cost
Superior Optical Quality	• Safety • Enhanced visibility
Full Interchangeability	• Reduced inventory and related costs • Ease of installation

Production of Sandwich Panels

Equipment required for manufacturing
flat sandwich panels; Hot Press Unit

Equipment required for manufacturing
sandwich panels
CNC Honeycomb machining unit

Fuel reservoir

Equipment required for manufacturing
sandwich panels
Autoclave

Canopy glasses being
under optic test

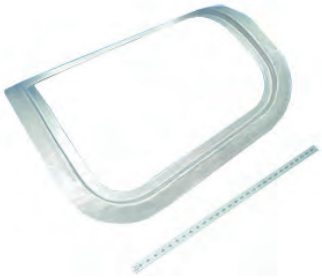
Ramp door skin

Manufacture of Metal Parts

HOUSING BRAKE
MAT: AL-2014

RING
MAT: AL 2014

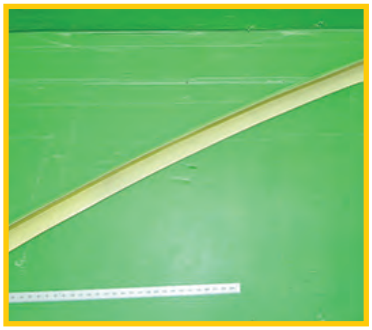
DUCT
MAT: CRESS 321



Window FRAME
MAT: AL-2024

Special fasteners

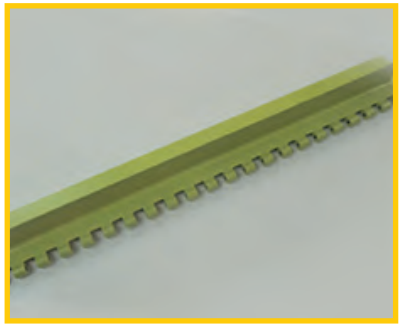
PLATE



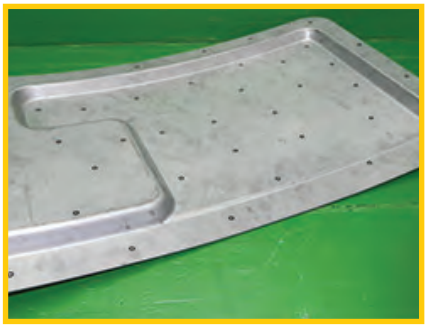
DEPRESSOR SEAL

CHANNEL

LIP ASSY



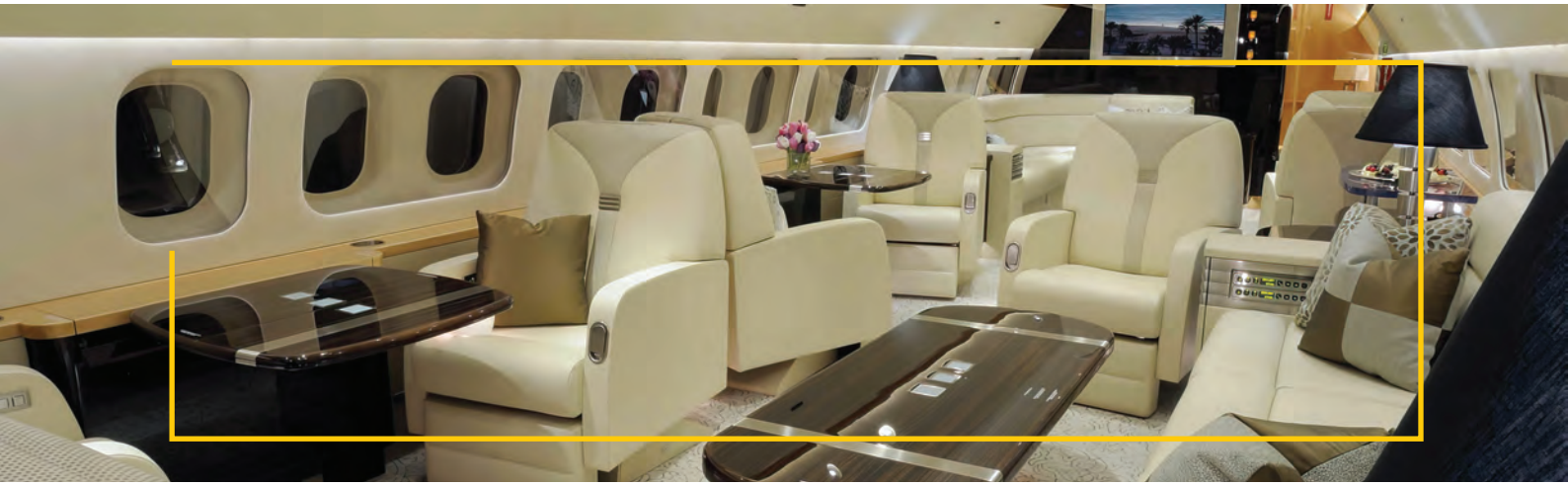
HINGE

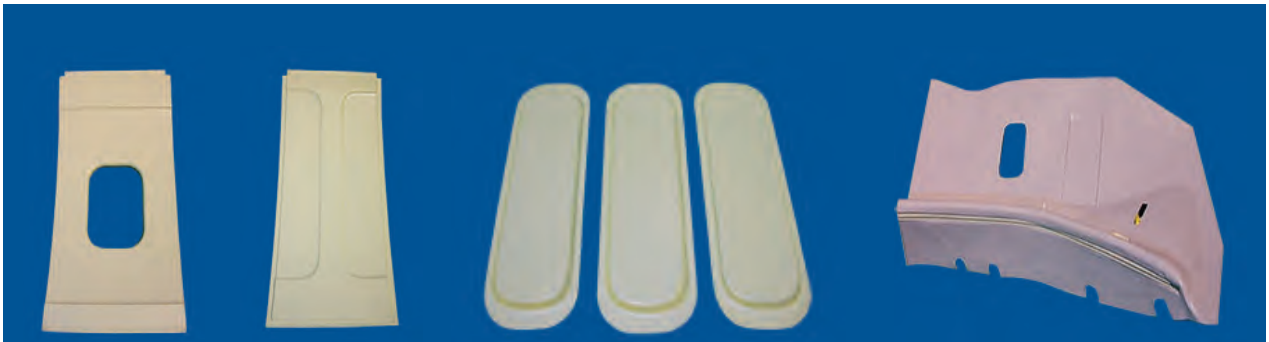


PANEL

HINGE

Manufacture of interior





Buffet and interior parts

Buffet

Manufacture of interior

Manufacture of window panel before air film related to interior

Installation of aircraft manufactured interior

Assembly of interior

Part samples produced in vacuum forming method

Manufacture plane curtain

Manufacture of covers for passenger seat handle

Production line for passenger seat

Assembly shop of passenger seat

Manufacture of interior

Designing and sampling
the passenger seat

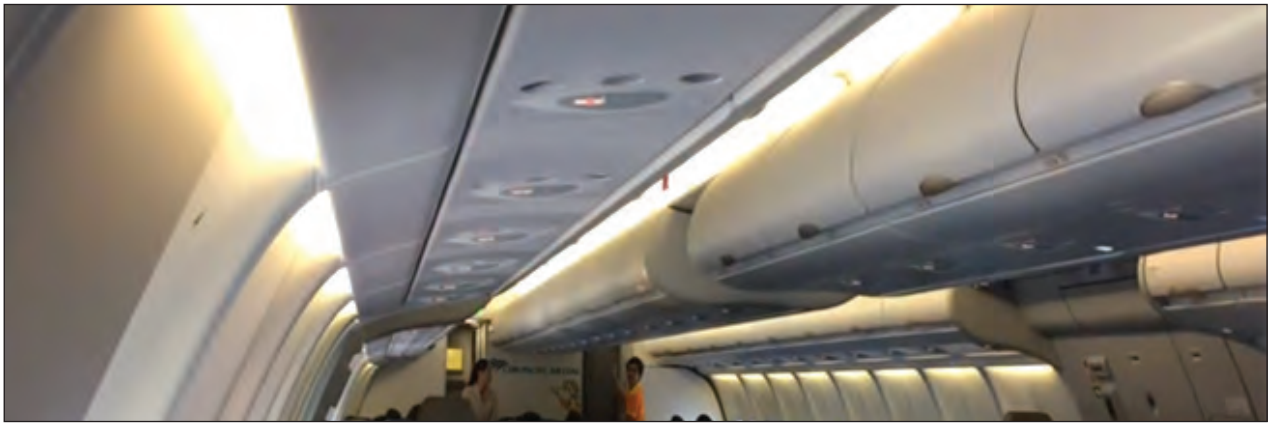
Serial production of passenger seat

Assembly shop of food trolley

Manufacture of hot jug

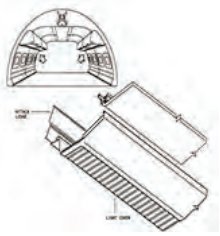
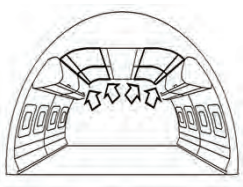
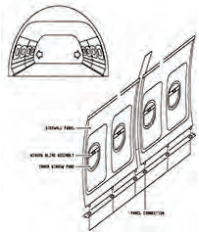
Manufacture of different types of the food trolley

Aircraft Cabin Illumination (LED)



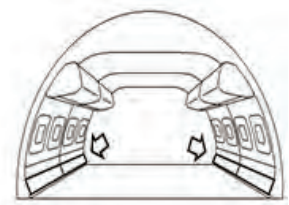
The advantages of LED lamps application are as follow:
1- Being economical and having higher efficiency in the rate of 30% to m40% more than compact fluorescent lamp (CFL) fluorescent lamps, incandescent lamps and high-intensity discharge lamps(HID)
2- Higher light Emission in a favorable direction
3- Longer lifetime than other light sources
4- Not used if mercury and other poisonous materials exist
5- Resistance to impact and mechanical shocks
6- Reducing cost and ease of replacement
7- Compactness and capability of installation on PCB
8- Possibility of adjustment of the produced light lumen by electricity current
9- Higher continuous application time
10- Guarantee for Fokker 100 is six months or 500 hr. And for MD series, Airbus A320 and A300-600 is twelve months or 3200 hr

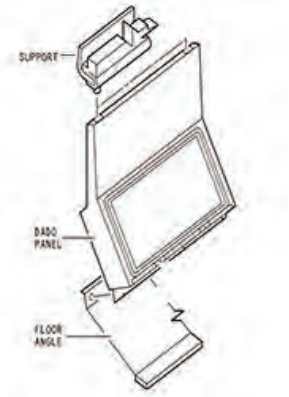


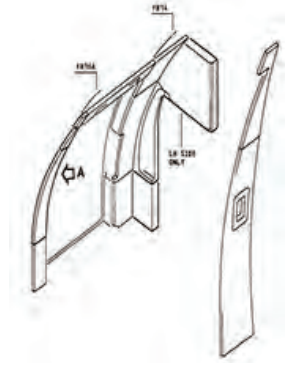




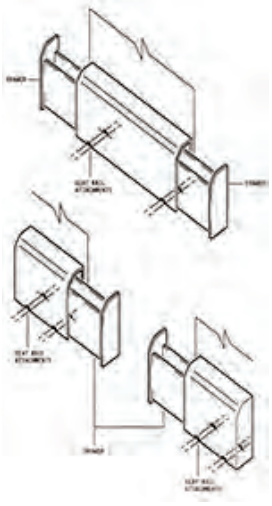

Cabin Procurement AIRBUS A330

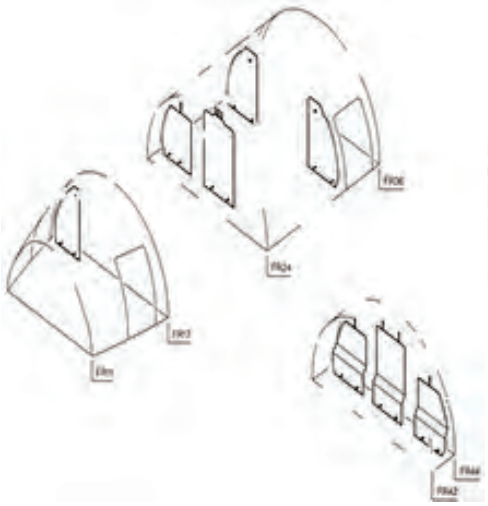
Capability of manufacturing aircraft interior

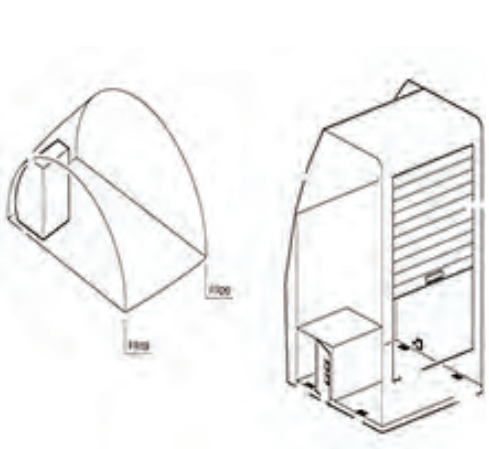






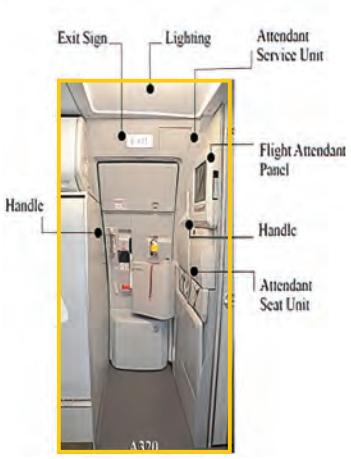


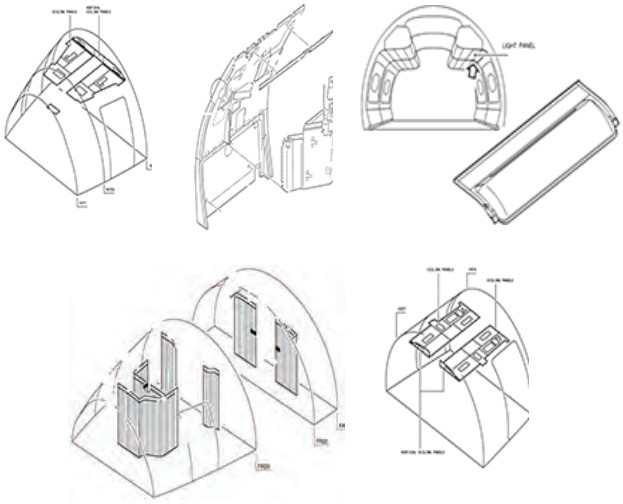




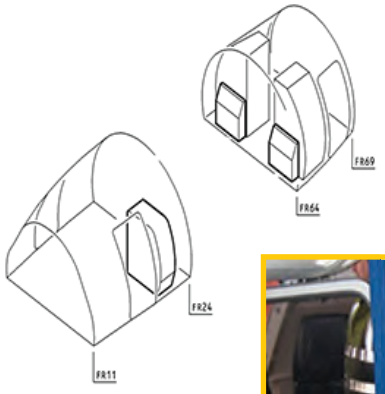
Cabin Procurement AIRBUS of A330

Capability of manufacturing aircraft interior





Cabin Procurement of AIRBUS A330



Cabin Procurement of AIRBUS A320

Produced Aerodrome Equipment

SAFETY SUPPORT

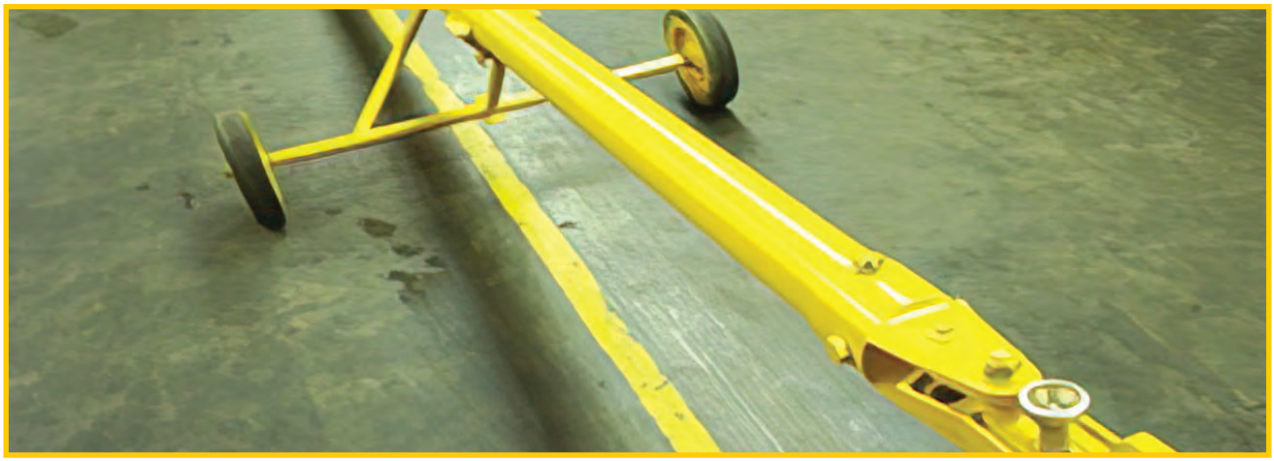
LADDER

TELESCOPIC HYDRAULIC CYLINDER

LADDER

SAFETY DEVICE

STAND



TOW BAR FORWARD

Design, manufacture and test of aircraft brakes

Introduction

Carbon brakes are the new generation of brakes that were used for the first time in 1973 on supersonic Concorde Jet. They have been used in the last decades on military and civil types of aircraft, racing cars, and high-speed trains.

These brakes have modern and complicated technology. Considering the established substructures, Iran A/C Manufacturing Industries Co. honors to take action to design, produce, and test the carbon heat sinks of aircraft brake.

To put the localization of technology into realization for designing, manufacturing and testing the carbon heat sink of landing gear mechanism tire and brake, has succeeded to meet all the requirements and regulations currently in the country aviation industry, implement the quality standards in production line (quality management system, ISO 9000.2008) as well as the quality management system in laboratories (ISO 17025) and finally receive the production certification (IPA) from CAO IRI to provide air fleet with one of the most consumable items.

A carbon heat sink is one of the most consumable and expensive items in aircraft. Based on the international aviation regulations and to enhance flight safety, the country airlines have to import these heat sinks

AIRCRAFT	HEATPACK P/N
FOKKER 100	IPAH 5013427-1
AIRBUS A320	IPAH GA31984
AIRBUS A300-600	IPAH GA32029
AIRBUS A300-600	IPAH GA32034
BOEING 737	IPAH 2606672-1/-2/-3/-4
BOEING MD	IPAH 2608892-1
BAE	IPAH AH091373

from abroad, because they are just produced in some countries, due to their modern and complicated production technology.

Considering the present situation in the domestic aviation industry and currency exit from the country and misuse of international communities to put pressure on I. R. Iran and achieve their goals; as its function, Iran A/C Manufacturing Industries Co. programmed to produce these heat sinks for different types of civil aircraft, based on the related carbon heat sink technical specifications and following CAO IRI Part-21 regulations, requirements of ETSO-C135A reference standard as well as CS-25 base standard. Upon passing the static and dynamic load tests on the wheel, tire, and brake, resulting in receiving IPA from CAO IRI and issuing Form One, has serially produced the following four types of carbon heat packs and two types of metal brakes have been produced so far:

Static and Dynamic Load Tests on Wheel, Tire, and Brake:

To simulate and evaluate the properties and specifications of aircraft wheel, tire, and brake the static and dynamic load tests are conducted in different flight conditions including taxi, landing, and take-off as well as in various velocities and times.

Static tests of the wheel, tire, and brake are carried out on different types of aircraft with RCS. Meanwhile,

Design, manufacture and test of aircraft brakes

dynamic tests of wheel and brake are accomplished on aircraft with weight up to 15 tons with IDM and dynamic tests of the tire as well as those of wheel and brake are done on aircraft more than 15 tons with TDT.

Standards for testing wheel, tire, and brake:

The tests on wheel and brake are conducted following ARP 1493, TSO-C135, CS-25, and MIL-W-5013. The tire tests are done according to MIL-T-5041 and TSO-C62. Based on the above standards, the brake shall be capable of absorbing energy in different states of aircraft inertia and the wheel and tire shall tolerate static and dynamic loads imposed during aircraft landing, taxi and take-off.

Capabilities of Static Load Unit:

- Yield and ultimate radial load test
- Yield and ultimate combination load test
- Structure torque test
- Footprint test
- Instant indication of the tire deformation amount
- Instant control of tire pressure
- Possibility of imposing simultaneous radial, lateral and tangential loads

Capabilities of the Dynamic Load Unit:

- Rotational test with combination loading to inboard and outboard direction
- Rotational test with radial load
- Take-off test
- Landing test
- Taxi test
- Overload test
- Simulation for ambient conditions such as wind blow
- Applying aircraft inertia via different flywheels

RCS static loading unit

Wheel and Brake Test Unit

Wheel and Tire Test Unit

F100 Carbon Heat Sink

A320 Carbon Heat Sink

737 Metal lining

F100 Carbon Heat Sink

BAE Carbon Heat Sink

Civil Aircrafts Tire

Design, manufacture, and test of civil aircrafts tires are done according to TSO-C62 standard and under the supervision of the Iranian Civil Aviation Organization (CAO).
The most features of these tires are endurance of high load and high speed during take-off and landing.
The designer organization has a DOA certificate and production organization has a POA certificate.
Now, the following tires were tested successfully and CAO has issued ITSOA for them:

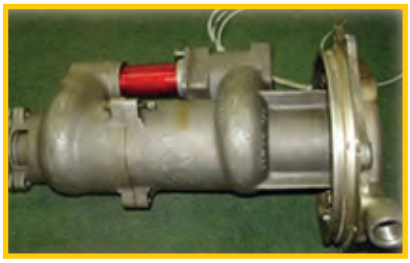
Row	Aircraft Name	Tire Size	Ply Rating	Inflation Pressure (Psi)	Speed Rating (MPH)	Load Rating (lb)	Part No.	Outside Diameter (in.)		Section Width (in.)		ITSOA No.
								Min.	Max.	Min.	Max.	
1	Fokker F100	H40×14-19	20	166	225	27100	BH409K02-1	39.1	40	13.2	14	ITSO-01
2	Boeing 747-200 Boeing 727-200 Airbus 310-300 Airbus 300 B4 Airbus 300-600 Airbus 320	49×17	32	210	235	50400	BH497F29T1	47.7	48.75	16.4	17.25	ITSO-06
3	Boeing 747-100 Boeing 747-SP Boeing 707-320C Airbus 300 B4 Airbus 310 200/300 Airbus 319 Airbus 320	46×16	30	225	225	44800	BH466F02T5	44.3	45.25	15.05	16	IR.21O.08
4	Boeing 707 Boeing 747-100 Boeing 747-SP Airbus 319 Airbus 310 200/300	46×16	28	210	225	41800	BH466F82T6	44.3	45.25	15.05	16	ITSO-05

Airbus A300

Boeing 747

Fokker 100

Capability to manufacture systems



Design, manufacture and repair of fuel pumps and tanks

Design, manufacture, and repair of fuel pumps and tanks

Design, manufacture and repair of different types of valve, system, and filter

Design, manufacture, and repair of air-conditioning and oxygen systems

Produced systems






- Design, manufacture, and repair of mechanic and power transfer systems


- Design, manufacture, and repair of electro-mechanic actuators

- Design, manufacture, and repair of electro-mechanic valves


FRICTION
FRICTION

Training courses

Training and Aeronautics Department

This department renders training services in the technical, expert, laboratory, software, management, foreign languages, accounting and financial, safety, standard, and quality fields.

Introduction

Providing organizations with modern sciences and technologies are included among the requirements of their survival in the new industrial world. Among the most important factors to realize it, we can refer to the effective training with optimal quality. As the actual capital of the community, the efficient and committed manpower provides the background required for expanding the optimal industrial production, minimizing the wastes, increasing efficiency, guaranteeing the interests and profitability.

In the third decade of its activities and in its way of permanent industrial development, Training and Aeronautics Department has provided numerous technical, specialized and applied training courses for all organizational levels in the company including high and intermediate managements, heads and chiefs, specialists and other organizational jobs and professions as well as for customers, with the usage of expert and experienced human capitals, advanced equipment and facilities, training vast space, test halls, and multimedia laboratories.

This manual submits a list of training titles in technical, expert, laboratory, software, management, foreign languages, accounting and financial, safety, standard, and quality fields for all requesting organizations and institutions.

- Approval of Training Organization for repair and maintenance (MTOE) and Approval of Training System (TPM) from CAO IRI
- Approval of Training Management System, complied with ISO: 10015, received from Iran Defence Standard Center (IDS)
- Enjoying a vast scientific and professional network as an exclusive capability composing of 150 teachers with official training certifications
- Establishment of the evaluation system and test of the supervisor during and at the end of training activities, according to the last standards
- Creation of expert working groups and scientific cores in different academic and skillful fields
- Capability of evaluating the personnel training needs of different industries and organizations of the country, with the usage of comprehensive training software and via programming for conducting the required training courses
- Valuable experiences regarding cooperation and relation with valid domestic and foreign universities to evaluate the staff modular training and upgrade them to the higher educational level
- Valuable experiences regarding training modern technologies ranging from design to manufacturing stage as localization and cooperation with other available facilities as well
- Organizing seminars, meetings and training workshops and cooperating with other organizations in this regard
- Granting valid training certificates to the trainees upon finishing each course
- Desirable resident facilities such as 24-hour accommodation, green space, and sports facilities, aimed at rendering services to organizations and guest trainees
- Possibility of visiting the capacities of Iran A/C Manufacturing Industries Co. as the biggest complex of designing and manufacturing the aviation products in the Middle East region

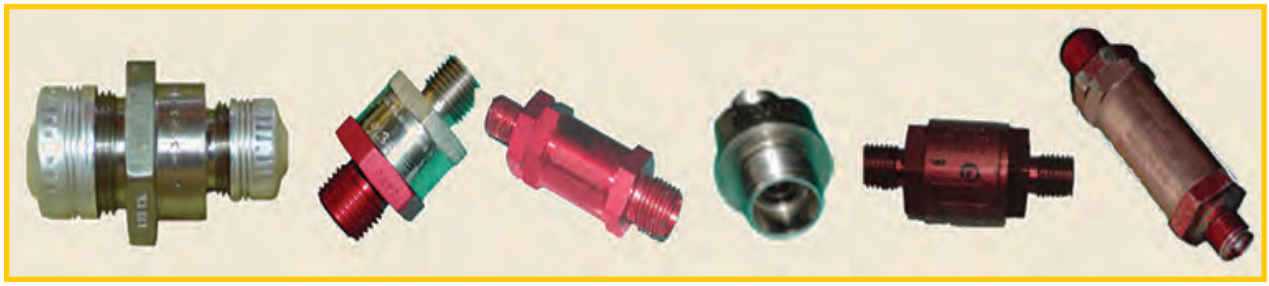
Design, manufacture and test of aircraft brakes

Design, manufacture, and repair of filters, tanks, pumps, and sensors

Design, manufacture and repair of the drain, pressure adjusting, and solenoid valves

Design, manufacture, and repair of filters, tanks, pumps, and sensors

Design, manufacture and repair of linear actuators



Design, manufacture, and repair of filters, tanks, pumps, and sensors

Capability to manufacture systems

Technical- Laboratorial Courses		
NO.	Title of Course	Duration (Hr.)
1	Analysis of uncertainty	30
2	Calibration and metrology	30
3	Special course of temperature instrument calibration	20
4	Special course of pressure instrument calibration	20
5	Special course of mass and volume instruments calibration	20
6	Special course of length instrument calibration	15
7	Familiarization with measurement and control devices	15
8	Magnetic particles inspection, MPI	50
9	Ultrasonic test	80
10	Mechanical-laboratory tests	23
11	Eddy current testing	45
12	Expert electro-avionic calibration	30
13	Familiarization with an X-Ray test	80
14	Chemistry, instrumental analysis	40
15	Non-Destructive Test (NDT)	20
16	Industrial- Practical heat treatment	16
17	Familiarization with casting defects	16
18	Steel key	8
19	Aluminum- Titanium Welding	8
20	Reverse engineering methods for industrial parts	16

Excellence and Management Courses		
NO.	Title of Course	Duration (Hr.)
1	Programming and project control	30
2	Statistical Process Control (SPC)	20
3	Human resources management	30
4	Programming technics	12
5	Organizational behavior management 1	30
6	Organizational behavior management 2	30
7	Problem-solving workshop	10
8	Management skills in solving working environmental conflicts	8
9	Modern principles of supervisory behavior	8
10	Research method	20
11	Archiving and its technics	30
12	Knowledge management (theoretical & practical)	32
13	Familiarization with Defence Quality Awards (DQA)	8
14	Electronic marketing	15
15	Efficiency management	16
16	Intermediate management	16
17	Familiarization with the work environment dressing system, IDS578-2009	16
18	Storage control management and system	50

Accounting and Financial Courses		
NO.	Title of Course	Duration (Hr.)
1	Final price accounting	30
2	Familiarization with financial management and engineering	30
3	Preparation of financial bills	30
4	Analysis of financial bills	20
5	Technical, financial and economic evaluation	30
6	Industrial accounting	48
7	Management accounting and costing	15
8	Management of inventory control	36
9	Auditing the documentation with an emphasis on applying Iran Accounting Standards	30

Capability to manufacture systems

Expert Safety Courses		
NO.	Title of Course	Duration (Hr.)
1	Safety in riveting and assembly processes	8
2	Safety in the casting process	16
3	Safety in chemical treatment and industrial plating	16
4	Safety in the machining process, part manufacturing and manual tools	8
5	Safety in explosives and ammunition in aviation industries	16
6	Safety in explosives during UAV launch and retrieval process	8
7	Individual protection devices	8
8	Safety in aircraft repair and maintenance process	16
9	Safety in ground operations of flight	16
10	Safety in air vehicles final assembly process	8
11	Safety during work with GSE	8
12	Mental health	16
13	Safety in the aircraft painting process	8
14	Safety of heads and foremen	8
15	Safety of pressurized gas tanks and cylinders	8
16	Safety in working process in Flight Test Center (FTC)	16
17	Protection against laser beams	25

Foreign Language Courses		
NO.	Title of Course	Duration (Hr.)
1	Russian language 1 & 2	150
2	English language 1, High Beginners	90
3	English language 2, Low Intermediate	100
4	English language 3, High Intermediate	110

General and Expert Software Courses		
NO.	Title of Course	Duration (Hr.)
1	AUTOCAD, Elementary	40
2	AUTOCAD, Advanced	96
3	Mechanical Desktop	60
4	CATIA, Elementary	60
5	CATIA, Advanced	50
6	CNC Programming	35
7	Master CAM	50
8	Power Mill 3 Axis	40
9	Power Mill Multi-Axis	25
10	Analysis of elastic dies, their formation and optimization with auto form	50
11	Familiarization with ABAQUS	40
12	ABAQUS, Advanced 1	60
13	ABAQUS, Advanced 2	80
14	MATLAB	40
15	FLUENT	50
16	ASP.NET Programming	60
17	Familiarization with Lab View	40
18	SPSS Statistical analysis and control	10
19	ACCESS 2013	26
20	EXCEL 2013	26
21	LINUX	50
22	Familiarization with PowerPoint 2010	20
23	Word 2013	26
24	Familiarization with Windows Basic Concepts	20
25	Internet	12
26	Post writing	30

Capability to manufacture systems

Technical and Expert Courses		
NO.	Title of Course	Duration (Hr.)
1	Geometric dimensioning & tolerances (GD&T)	40
2	Loft & template	60
3	Principles of metal corrosion and its preventive methods	20
4	Familiarization with different types of adhesive and sealant	50
5	Familiarization with different types of jig & fixture	15
6	Familiarization with principles of heat treatment	40
7	General hydraulics and pneumatics	25
8	Principles of design of composite molds and sandwich panels	56
9	Technology of manufacturing composite molds and sandwich panels	30
10	Production methods of composite molds and sandwich panels	67
11	Recognition of tools	50
12	Familiarization with special tools and shop equipment	50
13	The general course of sheet metal forming	30
14	The professional course of sheet metal	26
15	The professional course of machining	50
16	Familiarization with manufacturing processes of metal parts	50
17	The general course of non-metal parts	14
18	Professional non-metal part manufacturing	34
19	Recognition of different types of adhesive and foam	35
20	Production methods of fuel cell	128
21	Familiarization with non-metal materials and their applications	18
22	Principles of cutting tools selection	30
23	Operation with industrial Laser cutting machine	50
24	Recognition of parts	20
25	Familiarization with aviation alloys and their applications	32
26	Industrial map reading- Elementary	36
27	Failure mode effect analysis (FMEA)	20
28	Human factor (Ergonomics in tools design engineering)	16
29	Familiarization with reverse engineering	20
30	Position of manufacturing engineering in the product realization cycle	16
31	CNG operator, compressor dresser	20
32	CNG technician, compressor dresser	30

Capability to manufacture systems

NO.	Title of Course	Duration (Hr.)
1	Familiarization with ISO10015, methods of need evaluation, programming and effectiveness evaluation	16
2	Familiarization with Iranian Technical Standard Orders (ITSO)	30
3	Familiarization with Quality Management Standard in Aviation Industries, AS/EN 9100-2009C	16
4	Familiarization with Standards and Requirements of Aviation Products, based on CAD2108	30
5	Familiarization with International Standards, ISO 9001	30
6	Training the company(internal) auditors of quality management, based on ISO 9000-2000	18
7	Technical inspection and quality control process	12
8	Familiarization with Iranian Part Approval, IPA (PMA)	14
9	Familiarization with software standard in aviation systems, based on RTCA DO-178	40
10	Familiarization with design requirements of heavy aircraft, based on Part 25	32
11	Familiarization with Design Assurance System and receiving DOA	30
12	Technical inspection of aviation and vendor items	20
13	Establishment method of Quality Management System, based on ISO/ IEC 17025	24

Capabilities

• Approval of Training Organization for repair and maintenance (MTOE) and Approval of Training System (TPM) from CAO IRI
• Approval of Training Management System, complied with ISO: 10015, received from Iran Defence Standard Center(IDS)
• Enjoying a vast scientific and professional network as an exclusive capability composing of 150 teachers with official training certifications
• Establishment of the evaluation system and test of the supervisor during and at the end of training activities, according to the last standards
• Creation of expert working groups and scientific cores in different academic and skillful fields
• Capability of evaluating the personnel training needs of different industries and organizations of country, with the usage of comprehensive training software and via programming for conducting the required training courses
• Valuable experiences regarding cooperation and relationship with valid domestic and foreign universities to evaluate the staff modular training and upgrade them to the higher educational levels
• Valuable experiences regarding training the modern technologies ranging from design to manufacturing stage as localization and cooperation with other countries as well
• Organizing seminars, meetings and training workshops and cooperating with other organizations in this regard
• Granting the valid training certifications to the

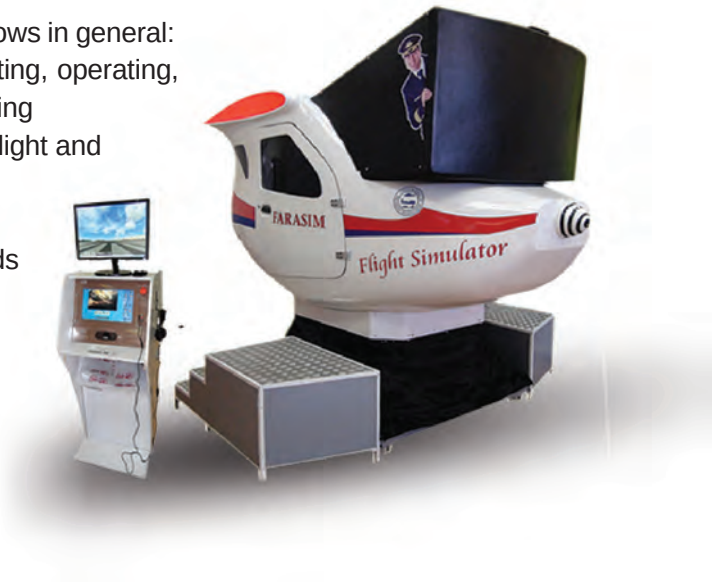
Training, designing, manufacturing and operating different aviation simulators

Capabilities:

The capabilities of simulator center are as follows in general:

• Designing, manufacturing, optimizing, updating, operating, repairing and maintaining and quality evaluating different types of aircraft simulators including light and heavy aircraft in international levels

• Rendering training services as pilot and aeronautics, following the international standards and CAO IRI regulations



Products:

• Full passenger aircraft flight simulator

• Airbus A320 A/C fixed flight simulator

• Cessna 172 light trainer flight simulator (Motion and desktop)

• Passenger A/C MCBT Software

• Passenger A/C link simulator

• Designing and putting the heavy cargo aircraft mock-up into operation

• Program and conceptual design of international and biggest country center for flight simulator training to learn how to run it

Ability to design and manufacture a complete simulator of passenger airplanes

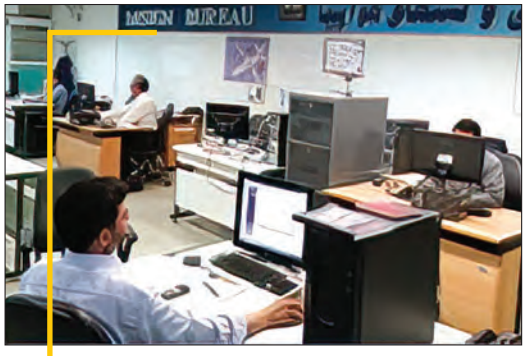
• Designing and manufacturing following JAR-FSTD-A Level C standard
• Has a certificate from the Civil Aviation Organization based on the CAD-FSTD-A standard
• Has a Quality Assurance System for use of Simulator and getting Daily Reporting of Training and Simulator
• It is possible to train all conditions and stages before, during and post-flight
• Emergency and emergency training
• With Cross Collimated Vision 180 FOV integrated imaging system
• Six degrees of hydraulic freedom and an advanced electric control system
• Simulation of all aircraft systems
• Simulation in all climatic conditions, including fog, snow, day and night (day, evening, etc.)
• Has a master trainer console with complete control of the simulator with the ability to plot Pilot flight track, placing the aircraft at any distance from the flight line, the Short Final or Long Final
• Automatic Calibration Test Reporting and ...
• Possibility of full navigation training and implementation of Flight Plan
• Possibility of complete training of systems and switches and easy maintenance
• The ability to automatically test assessment and report the simulator (electronically QTG)
• Usage of Real Instrument systems and displays of aircraft.

Training services:

• Primary and Periodic type Pilot Training (initial and recurrent) by using full flight simulator of civil aircraft in Hesa flight simulator center.
• Implementation of ground courses of Pilot training Courses
• Running PPL training Course at the Hesa Training Center (PPL)
• Establishing the training Center using a light airplane simulator and providing empirical general education services (currently the center has three main branches in Isfahan and the central services in Mashhad, Mazandaran, Gilan and Tehran.)
• Implementing initial measures to launch the largest and most equipped school of pilot training in the center of the country
• Setting up and managing a powerful training center with simulator flights soon

Desing Services & Aviation Engineering

Design:



- Design of all components, parts, and aggregates
- Preparation of a parametric model for external surfaces (mathematical model) in CATIA
- Preparation of RFP and technical manuals for products

Analysis:

- Making the engineering analysis and calculations: Software (NASTRAN, CFD, etc.)
- Hardware such as experimental wind tunnel tests including:
- Calculations and analyses of force, sizing, operational, static, dynamic (linear and nonlinear), calculations of load spectrum, heat, and fatigue
- Damage tolerance calculations
- Life estimation calculations
- Analysis of composite structures
- Design and simulation of dynamic algorithms

Manufacturing technology:

- Preparation of manufacturing and assembling drawings
- Compilation of manufacturing and assembling process
- Design of jig and fixture

Test:

Compilation of test plan, conduction of tests including:

- Sensor operations and preparation of test samples, programming and executing the calibration tests of ground loads
- Programming and executing the dynamic tests and vibrations, programming and executing the flight tests, for in-flight load and stress monitoring

Analysis of test data:

Establishment of project management systems, design documentation, management of design processes, design configuration, design approval, design quality and receiving the type certificates from valid authorities

Aircraft control mechanisms:

1. Design of hydraulic systems and related accessories as well as conduction of operational tests of hydraulic system circuit on different types of aircraft
2. Technological operations to manufacture, assemble and conduct operational tests of hydraulic system circuits

Aircraft Repair and Upgrade Industry

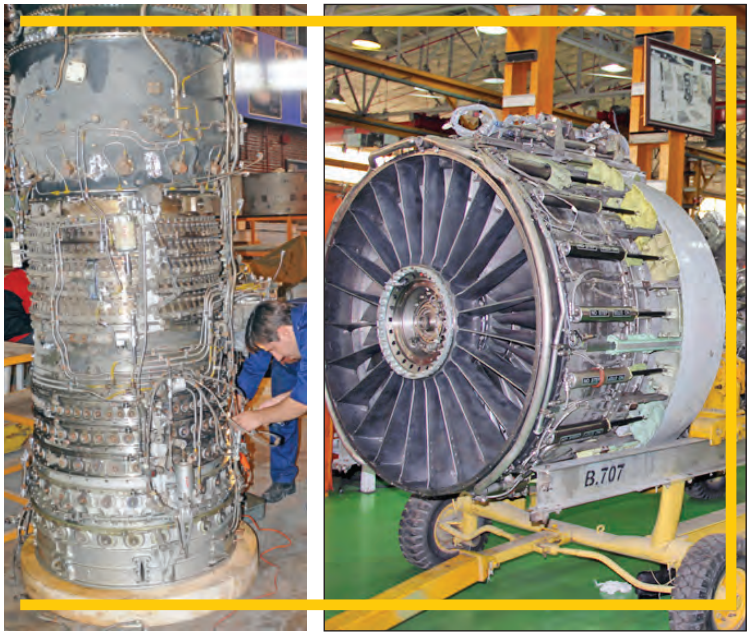
Aircraft Repair and Upgrade Industry is capable to perform a nose to tail overhaul, periodical checks, specialized inspections, modifications, renovation, aging, life assessment and service bulletins based on international standards, JAR-145 and EASA Part 145, and the manufacturer recommendations for some 26 different aircraft.

In multi-purpose wide hangars, large scales of technical tasks are performed on a variety of Civil Aircraft such as BAE 146, MD80/82/83, Fokker 100, Boeing 737, Airbus A-300, A-310, and A-320 family for checks, repair, maintenance, and overhaul.

As the holder of Maintenance Organization Exposition (MOE) Approval Certificate for 737 structural repairs from Civil Aviation Organization of the Islamic Republic of Iran (CAO-IRI) and Design Organization Approval (DOA), this company has successfully performed many Reinforcement and Upgrading projects on the Lap Joints of B-737 window corners.

Engine Repair and Upgrading Industry

Engine Repair and Upgrading Industry is a specialized industry capable of rendering technical services for Industrial and Aviation Engines of some 34 different kinds. All types of Turbo Jet, Turbo Prop, Turbo Shaft, and Turbo Fan are repaired and overhauled in this industry. Its technical tasks are performed on a variety of Civil Aircraft Engines such as PT6 Series, JT8D, CFM56, JT3D, JT8D, JT9D, CF6-50/60, and CF 700 for light, passenger and cargo aircraft. This Industry is also considered as an overhaul center for Ground and Industrial engines such as Solar, Centaur, 501K, GT40, GG4C, DR990, Avon, and Olympus engines.

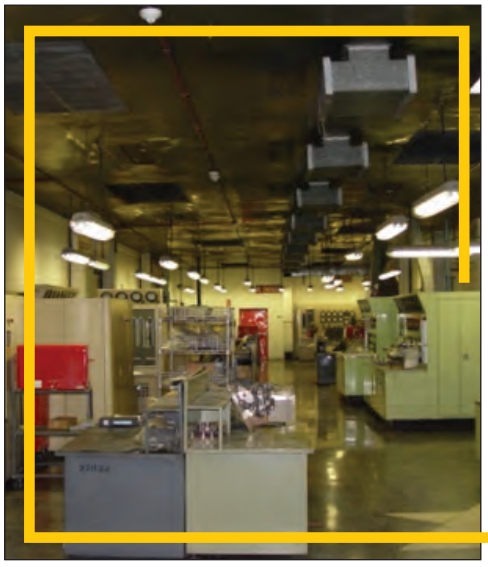


Engine Test Cell

Engine Test Cell performs ratification and final tests and acceptance of engines. This complex is one of the most modern and advanced testing centers in the Middle East region. Its diversity covers different kinds of power plants with a minimum of 500 to 100,000 pounds of thrust. This complex is also capable of testing engines in outdoor conditions.

Aviation Accessories Industry

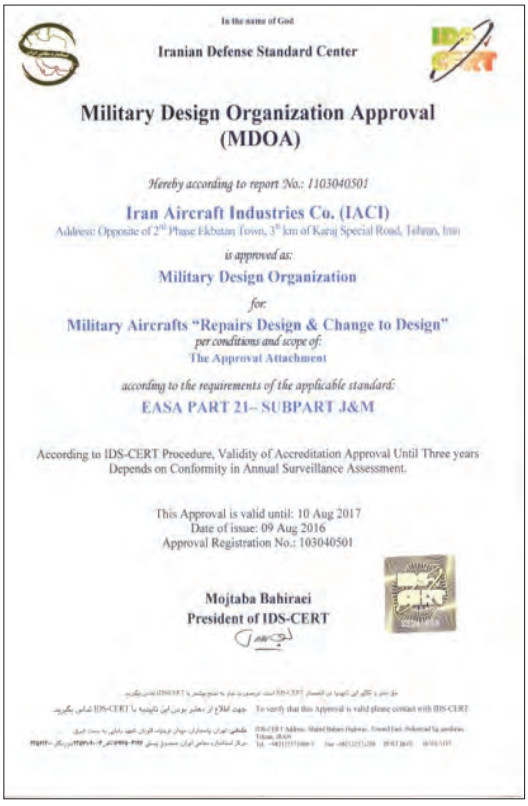
This industry is one of integrated industries consisting of 47 different specialized and technical back-shops performing repair and overhaul of hydraulic, electric, electronic, pneumatic, lubrication and fuel systems of a variety of Aviation accessories, while maintaining technical activities such as machining, coating, heat treatment, brazing, plating, grinding, cleaning, paint removing, a different type of welding, various NDT inspections, metallurgical analysis, hardness measurement, metal corrosion control, functional testing of subassemblies such as pumps, amplifiers, and governors.



This industry also performs Non-Destructive Testing (NDT) on aircraft and engine systems, subsystems, and components which are to be repaired and overhauled. NDT Process is based on modern methods such as FPI, MPI, X-Ray, Eddie Current, and Ultrasonic.

Aviation Systems and Accessories Manufacturing Industry

Aviation Systems and Accessories Manufacturing Industry has become more of a remarkable industry of as a practical solution to unjust sanctions in recent years. Transferring know-how and enjoying experienced technical staff, this industry has so far manufactured 1300 different types of components based on the latest Iranian Defense Standard Center (IDS), along with a wide range of special tools and stands for different types of Aircraft and Engines. This department has always come to aid in IACI's technical and research projects.



In the name of God

Iranian Defense Standard Center

Military Design Organization Approval (MDOA)

Hereby according to report No.: 1103040501

Iran Aircraft Industries Co. (IACI)

Address: Opposite of 2nd Phase Ekbatan Town, 3rd km of Karaj Special Road, Tehran, Iran

is approved as:

Military Design Organization

for:

Military Aircrafts "Repairs Design & Change to Design"

per conditions and scope of:

The Approval Attachment

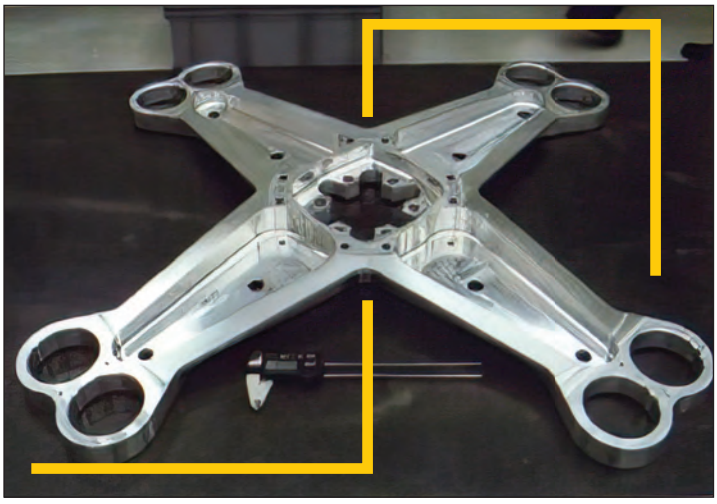
according to the requirements of the applicable standard:

EASA PART 21– SUBPART J&M

According to IDS-CERT Procedure, Validity of Accreditation Approval Until Three years Depends on Conformity in Annual Surveillance Assessment.

This Approval is valid until: 10 Aug 2017
Date of issue: 09 Aug 2016
Approval Registration No.: 103040501

Mojtaba Bahiraei
President of IDS-CERT



Standardization and Quality Assurance Center

Standardization and Quality Assurance Center has tactical responsibilities as follows:

• Production Control on spare parts and consumable materials for aircraft and its sub-assemblies • Issuing the Certificates of Release to Service (C.R.S)

• Achieving and Monitoring the Approval-based Technical Procedures and Non-Conformity of Materials.

• Operational Check-Out Control and Quality Assurance of Calibration Laboratory equipment, based on ISO/IEC 17025 (2017)

• Achieving and renewal of Accreditation Certificates through the Civil Aviation Organization CAO.IRI, Iran Defense Standards IDS and International Organization for Standards ISO

• Purchase Control along with related Documents

Training Center


Maintenance Training Organization Approval Certificate

Reference: IR.147.11

Iran Aircraft Industries (IACI)

Training Center conducts technical courses maintaining international standards and has been responsible for the training of personnel during the last 50 years.
This center enjoys its well-equipped work-shops and classrooms and highly knowledgeable instructors who have all had many years of technical and practical experience. Some of the courses presented in this center for a variety of Aircraft & Engines are as follows:
A) The General Aviation training course outline modules of theoretical and practical training are conducted according to CAO.IRI Part-147 standard B1-B2 courses as follows:

- A/C Familiarization,
- Airframe & Power plant,
- A/C Systems and accessories.

B) Specialized technical courses are performed for selected engineers, whether in Iran or abroad, according to different types of Aircraft.
C) Other specialized courses are also conducted in this center for back-shops and manufacturing activities, such as Welding, Corrosion Prevention Controlling Program (C.P.C.P), Life Assessment, and Aging.
Training Center is proud to be the holder of the below-mentioned certificates and is open to holding different integrated courses whether in Iran or other countries

- Maintenance Organization Exposition (MOE)
- Maintenance Training Organization Exposition (MTOE)
- Part 147
- MOA (Part 145)
- Part 21
- Continuous Airworthiness

Design & Industry Manufacturing of Aero Engines

TOLOO-4 (Turbojet Engine)

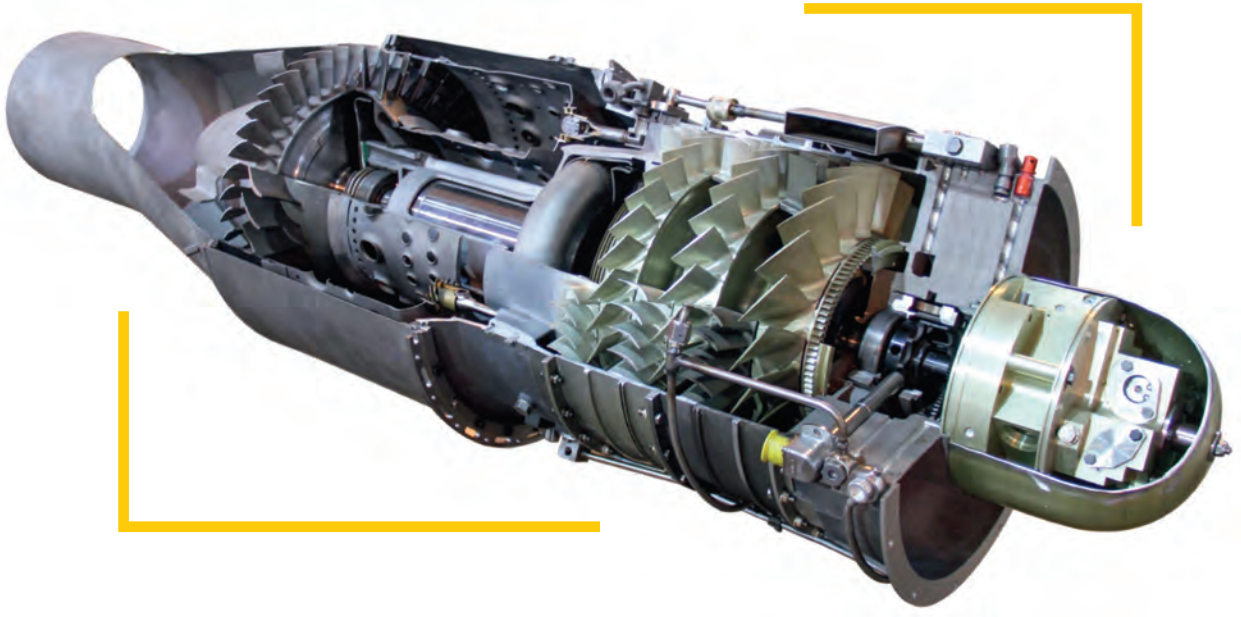
TOLOO-4 is a single shaft turbojet engine, which consists of 3 stages axial compressor, direct annular combustion chamber, and 1 stage axial turbine. This engine has a simple design, low cost, and high thrust to weight ratio. The speed control of the engine is hydro-pneumatic. The lifetime of the engine is 20 hr or 50 starts.

Performance Specification : (S/L,ISA)

- Thrust: 345 daN
- Maz SFC: 1.3 kg / daN.h
- CPR: 3.65
- Air Mass flow rate: 6.1 kg/s
- Engine speed: 28500 RPM

Technical Specification :

- Life: 20 Hr./50 Starts
- Flight altitude: 0-10,000 ft
- Weight: 55.9 kg
- Max. diameter: 330 mm
- Length: 1130-1330 m



SERAT 02 (Rotary Piston Engine)

The SERAT has been designed and manufactured as a power unit for Remotely Piloted Vehicles (RPVs) and UAVs. It is a rotary engine (Wankel-Type), internal combustion, Lightweight, air-cooled, and single rotor engine. The rotor is cooled by forced air from a centrifugal fan.

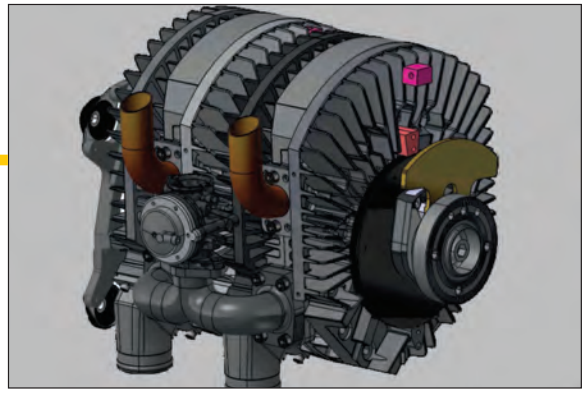
The engine has contactless electronic magneto ignition, runs on regular-grade Mogas or Avgas

lOOLL, and is suitable for pusher installation. Depending upon the duty cycle, it has 50 hrs. TBO

i.e. Time Between Overhauls

Design Specification

- Long life
- Low levels of vibration
- The low cross-sectional area
- Economical fuel consumption
- Exceptionally light power to weight ratio
- Technical Specification
- Engine Type Dual rotor Wankel type
- Capacity 416 CC
- Power Output 45 KW (60 hp)
- Weight 21 kg (46.31b) • SFC 400gr / kw . hr



Laboratories and Life Assessment Center

Life Assessment & Extension Research Management:

• Field Researches: Life assessment of engine's parts, life extension, remaining life, fracture mechanism analysis, and material substitution

• Mechanical Testing: Tensile, Compression, Fatigue (HCF, LCF), Creep, Macro Hardness, Micro Hardness & Superficial Hardness Spring Test (K, E, Cyclic, Fatigue, Tension, Compact)

• Metallurgical Testing: Sample preparation, microstructure research, and image analyzing hardness and Superficial Hardness Spring Test (K, E, Cyclic, Fatigue, Tension, Compact)

• Software Analysis: Linear & nonlinear stress analysis, Creep analysis, Fatigue analysis (TMF, Mechanical) fracture analysis, dynamic analysis, quasi-static analysis, vibration analysis, crack growth analysis, spin analysis, burst analysis, bird strike analysis, life assessment analysis, life extension analysis

Design and Manufacturing of Aviation Joints and Fasteners

One of the most important and reliable facilities of TEM is "Fasteners Production Shop". The facility combines all the basic equipment and skills required to produce standard fasteners by cold heading machines (two-stroke - one die).

Fabrication:

Fasteners are produced per procurement specification regarding AMS, NAS, MILITARY, ASTM, and DIN.

Parts shall be formed by cold heading and thread shall be formed by on the heat treatment by a single rolling process.

Test requirement such as decarburization, surface hardening, internal defect, stress rupture as well as tensile test shall be performed per MIL-STD-1312 and procurement specification.

Manufacturing capabilities:

- Screw, machine csk and pan head, the type of driver: Phillips recess, torque-set, tri-wing recess, slotted head.
- Rivet, solid(flush and universal head)
- Nut, self-locking extended washer (hex and double hex).
- Nut, plain hex
- Hi-lock pin and Hi-shear rivet.
- Stud plain and NS thread.

Production range:

- UN series (UNF, UNC, UNJF, UNJC thread) Diameter: #4(.112") thru .375"
- Length: ¼ inch thru 3 inches long.
- Metric thread: M3 thru M10
- Length: 6.00 mm thru 76 mm.

The various type of material used for fasteners production with different heading stock are as following:

- Carbon steel: 1005 thru 1015, AMS5069 (alloy 1018).
- Low alloy steel: AMS6322 (alloy 8740), AMS6415 (ALLOY 4340).
- Corrosion heat resistant steel(series 300): ASTM A493(alloy 302,304,316,384,...),AMS5628(alloy 431),AMS5613(alloy 410).
- Superalloy: AMS5731 (alloy A-286), AMS5732 (alloy A-286), AMS5737 (alloy A-286), AMS5687 (Inconel 600).
- Aluminum alloy per QQ-A-430(2024-O, 2017-O, etc.)
- Aluminum alloy: QQ-A-430

1-AMS 5069(alloy 1018)	2-AMS 6322(alloy 8740)	3-AMS 5731(alloy A-286)
4-ASTM A 493(alloy 384)	5-AMS 6304(alloy 17-22A)	6-AMS 5628(alloy 431)

Capabilities

- Tensile test
- Shear test
- Stress rupture
- Implementation of various processes of hardening, coating
- Implementation of various test to assure specialization of manufactured parts
- Design and manufacturing of aviation joints and fasteners related to AMS, NAS, ASTM, and MIL
- The ability of material in resisting manufacturing processes such as forge, rolling, and heat treating, etc.

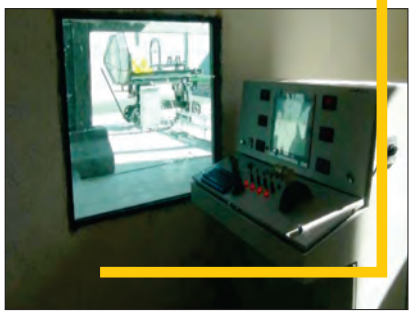
Different Types of Fasteners in Production Line include

- Screw CSK flat and pan head (torque set, Phillips recess)
- Screw, matching round head
- Rivet, solid universal and flush head
- Screw, flat fillister head rivet, solid flush head
- Extended washer
- Nut, self-locking and plain head
- Bolt, hex head
- Stud, plain NS
- Hi-lock pin

Test Technology Development Management

Design and manufacturing of:

- Test Equipment
- Hydraulic and pneumatic systems
- Gas turbine and piston-type engine test cells
- Gas turbine engines accessories test benches
- Design and implementation of data acquisition systems
- Gas turbine engine module test rigs such as compressor, combustion chamber, etc.
- Repair, overhaul, and testing of gas turbine engine accessories such as pumps and FCU valves, etc.



Oceanographic Vessel

The ship serves as oceanographic research and suitable for carrying out the scientific and technological activity, in other words, a ship for special services with long-distance international navigation and water reserves, bunkers and sufficient supplies will be provided to allow for at least 30 days of continuous operations, without sea to sea refueling\ restocking with a fully equipped crew and researchers.

The ship will be equipped with two Diesel engine systems with two shafting lines and two controllable blades propellers, two maneuvering lateral bow and stern propellers; propellers will be protected and placed to avoid any interference with launching operations, recovery of systems and instruments. The material is steel grade “A” for hull structure and aluminum alloy for superstructure, machinery, equipment, and furnishing materials will be suitable for shipbuilding. The dimensions and chemical composition of the materials, equipment, machinery, etc. will comply with the requirements of the classification society.

The hull with submerged support is utilized for acoustic transducers’ positioning system and Multi-beam system. Moreover, the hull will be predisposed for the fixed positioning of a scientific echo sounder, a navigational echo sounder, acoustic windows for a chirp system and ADCP, sensors, and a water loading system.

The apparatus, winches, equipment, pumps, machinery, ventilation systems and anything else will be installed and assembled according to the instructions, the operative and constructive methods resulting from a study on noise and vibration reduction, in particular for laboratories, common areas, cabins, bridges, work areas, and control rooms. Also, this ship will accommodate at least 21 people. The vessel with engines and equipment is built under the supervision of, and following rules classification society.

Main Particulars		
Type of Vessel	**Oceanographic Vessel**	**Unit**
Superstructure	Aluminum	-
Hull Material	Marine Steel, Grade A	-
Length	49.98	m
Breadth	10	m
Draft	3.3	m
Fresh Water Tank	38	m^3
Fuel Tank	171	m^3
Researchers & Officers	21	person
Crew	6	person
Speed	14	kn
Lab. Area	70	m^2
Aft. Working Deck Area	120	m^2
Sea State	4	-
Main Engines	2×1030	KW
Duration	30	days
Range @ 12.5 Kn	3000	N.M.
Crane	1×7 ton @ 10 m	
	1×2 ton @ 7 m	
	1×10 ton @ 8 m A-Frame	
	1×5 ton @ 5 m A-Frame	

Offshore Supply Vessel

Main Particulars		
Type of Vessel	**Oceanographic Vessel**	**Unit**
Length Overall	58.7	m
Breadth Molded	14.6	m
Design Draft	4.75	m
Gross tonnage	1450	-
DP Class	DP 1	-
Complement	42	person
Speed	13	kn
Main Engine	2 × 2575	hp
Main Gen. Set	3 × 315	kw

This is an offshore supply vessel that is capable of operating in open seas. The vessel is equipped with two Controllable Pitch Propellers and one bow thruster. The hull and superstructure made of marine steel and engine room are located in the middle.

The vessel is designed in such a way that roles as towing, transporting (liquid cargo, bulk cement, liquid mud, stores, materials & equipment), firefighting, transporting men and materials between shore and platforms, and also it can operate for 24 hours/day continuously. (Capable of remaining on station for a minimum of 14 days).

Oil Recovery Vessel

The Multi-Purpose Sea going vessel, is suitable for operating in harbor and in open sea. The main objective of the vessel is to participate in oil spill recovery operation. The main oil recovery system will be a built-in system.

The vessel will also be equipped with facilities to restrict and extinguish fire from burning. This vessel fuel over the sea surface or other ships on fire and their own ships and are capable of supporting search and rescue operations (SAR).

The vessel will be capable of supporting DP (Dynamic Positioning System) and helicopter hovering deck arrangement.

The Multi-purpose Oil Recovery Vessel complying with the requirements of Classification Society Standards for operating in coastal areas and open seas shall be eligible for the assignment as “Oil Recovery Vessel” service.

The hull with solid framing will be capable to withstand all the berthing loads. Interior space accommodates 22 crew. Wheelhouse with ample windows will provide a good visibility, for captain during all kinds of operation. The large work-deck area with suitable strength and a marine crane is designed for oil recovery.

Main Particulars		
Type of Vessel	**Oceanographic Vessel**	**Unit**
Length O.A.	60	m
Breadth	13	m
Depth	6.5	m
Draft	4	m
Fuel Oil	250	m^3
Fresh Water	50	m^3
ORO	550	m^3
Propulsion	2×Z drive	-
Auxiliary Engine	2×1000	KW

Supply Crew Ship

This vessel is a twin-screw supply crew ship and is designed for the harbor, coastal, and unrestricted tropical operation. The vessel is designed to carry 90 passengers,65 tons of fuel oil, 50 tons freshwater cargo, 8 m^3 deep freeze cargo, 8 m^3refrigerated cargo, 12 m^3 provisional store cargo and to be able to carry 50 tons equally separated of cargo or 30 tons truck on the aft deck.

The vessel is designed to withstand up to sea state 6. Range of operation on a continuous cruising speed of 1000 nautical miles. The hull and superstructure of the vessel are of all-welded construction. The hull is made of marine steel materials, grade "A" shipbuilding. The superstructure is made of aluminum alloy.

Accommodation facilities are located in the superstructure and it is adequate for a complement of 15 crew and all materials and equipment are marine type and appropriate for this kind of vessel. The vessel is equipped with several kinds of pumps, ventilators, air-conditioning, air compressor, internal and external firefighting system, radar, nautical and navigation equipment, safety appliances, internal and external communication system, hydraulic units, electrical installation system, etc.

The vessel is manufactured under the supervision and according to the rules of classification society.

Main Particulars		
Type of Vessel	Supply Crew Ship	Unit
Hull Material	Steel	-
Superstructure	Aluminum	-
Length	47	m
Breadth	8.55	m
Depth	4.67	m
Draft	2.86	m
Fresh Water Tank (cargo)	50	ton
Fuel Tank (cargo)	65	ton
Fridge Space	8	m^3
Passenger	90	person
Crew	15	person
Speed	21	Kn
Sea State	6	-
Main Gen. Set	2×135	KVA
Main Engine	2×3300	hp
Endurance	1000	N.M

Crew Boat

The vessel shall be constructed as a medium speed, sea-kindly, crew, and cargo boat for operation in ambient air temperature of max 50 °C and 95% RH and seawater max temperature of 32°C.

The vessel will be operated at a sea state of 5. The bridge is arranged to allow all-round vision. Entry to the passenger decks is via rear doors. The aft control station is located on the top deck, behind the main bridge station within the air-conditioned bridge area. A suitable counter equipped by the refrigerator for serving snacks is arranged in the passenger area. Two toilets are positioned aft on the top deck for passengers and two at the crew accommodation area.

This ship can be used to support the inlands and transporting equipment, machinery, etc.

Expansive cargo deck area with recessed tie-down points are located aft of the wheelhouse. The vessel shall be an all-welded, transversely framed, longitudinally stiffened aluminum structure. All scantling shall be following the Shipping code for aluminum planning craft, and the vessel is manufactured under the supervision and according to the rules of classification societies.

Main Particulars		
Type of Vessel	**Crew boat**	**Unit**
Material	Aluminum	-
Superstructure	Aluminum	-
Length	33.5	m
Breadth	7.93	m
Height	6.2	m
Draft	1.5	m
Fresh Water Tank	22000	litre
Fuel Tank	32000	litre
Passenger	86	person
Crew	6	person
Deck Loading	35	ton
Speed	24	kn
Sea State	5	-
Main Gen. Set	2×60	KVA
Main Engine	4×1150	hp
Endurance	450	N.M

Tug Boat 1200 & 2400 hp

This vessel is a modern seagoing twin screw tug/workboat appropriate for harbor coastal zone operations. The vessel has features such as a compact deckhouse at the fore and large aft deck area with a specific load of 2 ton/m^2. The single chine hull and the superstructure are all-welded construction and are made of grade “A” marine steel.

All materials and equipment are marine types and appropriate for this kind of vessel. The deckhouse and living quarters below are suited to accommodate officers and crew for a total of 8 persons. The vessel’s propulsion system consists of two marine diesel engines, each driving a fixed-pitch propeller in a fixed nozzle. These engines have a closed cooling water system and are air started. This vessel has fuel oil tanks, freshwater tanks, sewage tanks, and a foam tank. A hydraulic crane and a hydraulic towing winch are fitted on the aft deck. The vessel is also equipped with auxiliary and lateral equipment such as several kinds of pumps, air conditioning system, ventilation system, air compressors, internal and external firefighting system, radar, safety appliances, nautical navigation equipment, internal and external communication system, hydraulic units, electrical systems, etc.

Main Particulars			
Type of Vessel	1200 HP	2400 HP	Unit
Length Overall	25	25.86	m
Breadth Molded	7.25	9.44	m
Depth	3.75	4.3	m
Design Draft	2.65	4.30	m
Bollard Pull	14.7	30	ton
Speed	10.3	11	Kn
Main Engine	2 × 612	2 × 1250	hp
Main Gen. Set	2 × 60	2 × 100	KVA

Tug Boat 4400 HP

This vessel is a modern design Azimuth stern drive tug with high maneuverability and excellent performance. The propulsion system consists of two main engines, air starter and two steerable rudder units with fixed pitch propellers in nozzles. The vessel is designed for towing on the hook and pushing operations. This vessel can be used for harbor, coastal berthing operation and offshore platforms towing, and also firefighting operation. The vessel has a compact deckhouse on the forecastle deck and a large aft deck and a spacious foredeck. The deckhouse and below deck accommodation are designed to accommodate officers and crew for a total of 8 persons.

A large aft deck is placed behind the superstructure, suitable to carry loads up to 30 tons with a specific weight of 3 ton/m^2. A heavy-duty two-speed hydraulic anchor/towing winch is fitted on the forecastle deck. The hull and superstructure of the vessel are all-welded construction made of grade “A” marine steel. All materials and equipment are marine types.

This vessel is also equipped with auxiliary and lateral equipment such as several kinds of pumps, air conditioning system, ventilation system, air compressors, internal and external firefighting system, radar, safety appliances, nautical navigation equipment, internal and external communication system, hydraulic units, electrical systems, etc.

Main Particulars		
Type of Vessel	**Tug Boat**	**Unit**
Length Overall	30.82	m
Breadth Moulded	10.2	m
Depth	4.8	m
Design Draft	4.55	m
Bollard Pull	48.6	ton
Speed	12.8	kn
Main Engine	2 × 2204	hp
Gen. Set	2 × 97	KVA

Landing Craft 150 up to 5000 DWT

This vessel is a multicarrier ship and has a shipshape body in fore and aft and a flat bottom construction in amidships capable of land for loading and unloading of deck cargoes. The superstructure of the vessel is located at aft deck and is designed to accommodate officers and crew for a total of 11 persons. A large deck area is provided in the form of the superstructure for loading of packed cargoes, containers and trucks, and suitable to carry loads up to approx. 4 ton/m2 on the deck area 18 long trucks (trailers). The propulsion consists of two sets of the main engine, gearbox, shaft and fixed-pitch propeller and two rudder steering on it.

The vessel is equipped with several kinds of pumps, ventilation, air conditioning, air compressor, internal and external firefighting system, radar, nautical and navigation, equipment, safety appliances, internal and external communication system, hydraulic units, electrical installation system, etc.

The vessel is manufactured under the supervision and according to the rules of classification societies

Main Particulars					
Type of Vessel	**Landing Craft 2500 Ton**	**Landing Craft 2000 Ton**	**Landing Craft 1500 Ton**	**Landing Craft 1000 Ton**	**Unit**
Material	Marine Steel Materials, Grade A	Marine Steel Materials, Grade A	Marine Steel Materials, Grade A	Marine Steel Materials, Grade A	-
Length	80	76	76	49.95	m
Breadth	17.5	17.5	17.5	14.5	m
Draft (Loaded)	3.25	3	2.8	2.3	m
Speed	10	10	10	10	Kn
Deadweight	2500	2000	1500	1000	ton
Main Engine	2×1300	2×1000	2×1000	2×720	hp
Main Gen. Set	2×97	2×145	2×90	2×85	KVA
Range	800	800	800	800	N.M

Cutter Suction Dredger

The Cutter Suction Dredger is reliable, fuel-efficient, has low maintenance costs and is extremely productive at all dredging depths. The prime mover for the dredge pump is an appropriate diesel engine with low fuel consumption, and low NOx and soot emissions. The vessel improvement include:

- An exceptional rate of pumping power, unrivalled in its class
- Improved ergonomics
- Cutter Special pump combining high efficiency and a large spherical passage – providing high availability
- Low maintenance and efficient power distribution with a single diesel engine
- Enhanced safety features, such as a separate pumproom.

Designing and manufacturing are according to rules of Classification Society.

Cutter Suction Dredger			
Principal particulars		**Dredge pump**	
Length overall, ladder raised	32.30 m	Type HRCS 1200-250-500, single-walled	
Length over pontoons	21.65 m	SCAC developing 1,249 kW (1,699 HP) continuous power at 1600 rpm	
Breadth	7.87 m	The dredge pump is driven through a combined pump	
Depth	2.44 m	block/reduction gearbox	
Side pontoons:	19.00×2.40×2.42 m	Ball clearance: 250 mm	
Mean draught with full bunkers	1.45 m	**Cutter**	
Maximum standard dredging depth	14.00 m	Type 10-CB-AL-1455-180-V04	170 KW
The internal diameter of the suction tube	550 mm	Power at shaft Diameter	1.455 mm
The internal diameter of discharge pipes	500 mm	Maximum speed	30 rev/min
Total installed power	1.249 KW	**Spud hoisting rams**	
Spuds		Force	262 KN
Length	19 m	Ram stroke	2.10 m
Diameter	559 mm	Spud stroke (each time approx.)	3.30 m
Weight	5,400 kg	N.M	

General Cargo 6000 DWT

This is a single-deck cargo, single-screw general cargo vessel with foredeck and aft deck, superstructure at the aft, double bottom from forepeak bulkhead to aft peak bulkhead, double sides in cargo tanks area, bulbous bow and flat stern.
This vessel is designed to transport general cargo, bulk cargo, containers (including TEU and FEU up to 9 feet height), timber, grain, steel, and coal.
The vessel and its equipment have been designed and built following International Shipbuilding Standards and International rules and regulations.

Main Particulars		
Type of Vessel	**General Cargo Ship**	**Unit**
Length Overall	121.7	m
Breadth Molded	16.5	m
Design Draft	5.06	m
Deadweight	6271	ton
Container Capacity	234/114	TEU/FEU
Container Capacity on Main Deck	174/84	TEU/FEU
Crew	14	person
Speed	11.5	kn
Main Engines	2450	KW
Endurance	20	Days

Flat & Tanker Barge (350 Up to 3500 DWT)

Main Particulars							
Type of Vessel	Tanker Barge						Unit
	350 DWT	500 DWT	1000 DWT	1500 DWT	2000 DWT	3000 DWT	
Length O.A.	32.6	36.6	42	56	60	76	m
Breadth	10	11	14	15	15	14.51	m
Depth	2.4	2.4	3.6	3.6	3.5	4.5	m
Draft (loaded)	1.6	1.66	2.38	2.46	2.82	3.45	m
Draft (lightweight)	0.43	0.45	0.55	0.56	0.52	0.55	m
Lightweight	140	170	285	380	405	510	ton
Displacement (full load)	490	670	1285	1880	2405	3530	ton
Diesel pump capacity	140	180	180	180	200	200	m^3/h

Main Particulars					
Type of Vessel	Flat Barge				Unit
	1000 DWT	1300 DWT	2000 DWT	3500 DWT	
Length O.A.	42	55.2	54.85	65	m
Breadth	12	15.16	15	19.3	m
Depth	3	2.5	4.2	4.5	m
Draft (loaded)	2.4	1.9	3.4	3.45	m
Draft (lightweight)	0.45	0.43	0.6	0.7	m
Displacement (full load)	1000	1620	2400	4220	ton

This vessel is designed to carry cargoes on the deck and has a flat bottom construction.

On the end of the foredeck, there is a mechanically operated ramp for loading and unloading of deck cargoes. A large deck area is provided for loading of packed cargoes, containers and trucks, and suitable to carry loads up to approx. 3.5 ton/m^2. One meter height bulwark is installed around the deck. Under the cargo deck, there are 12 void spaces. There is no propulsion system on the barge and the vessel is transferred by a tug boat. For this purpose, two units of towing bit have been located at the foredeck. The hull of the vessel is of all-welded construction and is made of marine steel materials, grade “A” shipbuilding. All materials and equipment are marine types and appropriate for this kind of vessel. Also, this type of vessel could be used as a tanker barge and flat barge in a different capacity.

The vessel is manufactured under supervision and according to the rules of classification societies.

Floating Dock 800 - 2000 - 4000 Tons

The dock is designed for docking of ships up to 4000 ton lightweight at a seawater density of 1025 kg/ m^3. There will be 700 tons of ballast water available in the ballast tanks for the compensation of trim and heel and reduction of the longitudinal deflection.
Discharge of compensation ballast water can increase the lifting capacity up to about 4700 tons under certain circumstances. The metacentric height will be 2.5m when docking a ship weighing 4000 tons and having a center of gravity 9m above the keel blocks when the bottom of the ship is at water level for a ship weighing 4000 tons.
The same length as the dock, pumping time will be less than 90 minutes from the moment when the ship touches the keel blocks until the pontoon deck at the outer wall of the wing walls emerges from the sea.
The dock's hull cross-section should be U-shaped. The dock consists of a continuous bottom forming the carrying body and of two continuous wing walls. The maximum useful carrying capacity of the dock with 0.4 m freeboard of the pontoon is 50 tons per meter of dock length. The aprons are calculated for a load of 1000 kg/m^2, the upper decks for 500 kg/ m^2, and the connecting bridges to be calculated for a moveable load of 500 kg. The dock's hull is of an all-welded structure built of marine steel materials, grade" A ". 100 keel blocks of steel each 1.75 m height, and has been rated for a load of 60 tons.
Accommodation facilities for 20 persons of the dock crew are located in the starboard wing wall and facilities for 80 persons of the docked ship's officers and crew in the port wing wall.
The dock is calculated for towing by a tugboat. There are 4 ballast pumps, each 2000 m^3/h capacity, and 32 auxiliary pumps in the cross tunnel. Also, there are 3 main diesel generators and 1 auxiliary, each 400 kW power, and 2 air compressors with 7m^3/ min. on the dock. The dock is designed for Persian Gulf conditions. All materials and equipment are marine types, and appropriate for this kind of dock. The dock is equipped with several kinds of pumps, ventilation, air conditioning, refrigeration, air compressor, internal and external firefighting system, cranes, docking control equipment, safety appliances, internal and external communication system, hydraulic unit, electrical installation system, workshop and repair facilities, etc. The dock is manufactured under the supervision and according to the rules of classification society.

Floating Dock 800 - 2000 - 4000 Tons

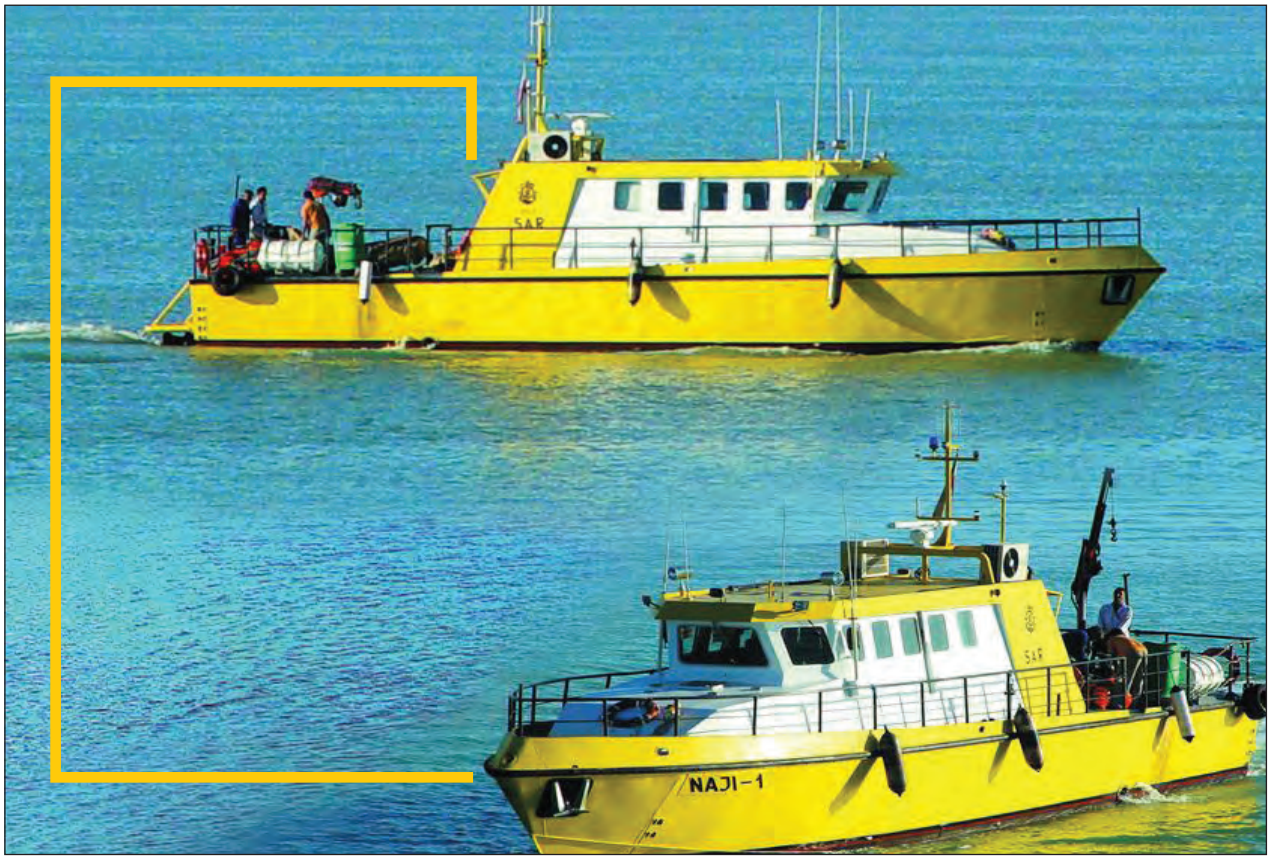
Main Particulars				
Type of Vessel	Floating Dock 4000 Ton	Floating Dock 2000 Ton	Floating Dock 800 Ton	**Unit**
Material	Marine Steel Materials, Grade A	Marine Steel Materials, Grade A	Marine Steel Materials, Grade A	-
Length	130	105.55	62	m
Pontoon's Length	117.81	95	50.6	m
Breadth	28	22	20	m
Breadth Molded	21	17	15	m
Pontoon's Depth	3.15	2.2	8	m
Depth	15.25	11	8	m
Draft (Light Weight)	1.15	0.813	0.75	m
Draft (Loaded)	2.75	1.9	1.55	m
Immersion Depth	11.05	7.3	6.5	m
Complement	20	12	12	person
Lifting Capacity	4000	2000	800	ton
Light Weight	3300	1850	680	ton
Ballast Pumps Capacity	4×2000	4×800	4×450	m^3/h
Main Gen. Set	4×478	2×450	2×230	KW

Passenger boat 30 - 120

The passenger vessels with monohull and catamaran hull forms are designed and manufactured for transporting 30-120 passengers.
The construction of the vessel is suitable for commercial ferry operations in the Caspian Sea and the ersian Gulf.
The maximum ambient air temperature is of +45˚C with 95% R.H. and min. the temperature of +5˚C, seawater temperature of +32˚C for the Persian Gulf.
The structural arrangement is following appropriated rules for the special passenger boat (120 passengers plus 5 crew, 300 nautical miles)
The hull, superstructure, and all deckhouse structure are made by composite materials or aluminum. All materials and equipment are marine types and appropriate for this kind of vessel.
The appropriate design and construction improve seagoing abilities for excellent seaworthiness up to sea state 2-3.
Designing and manufacturing are according to the rules of the Classification Society.

Main Particulars			
Type of Vessel	120 Person	30 Person	Unit
Length	22.4	15.7	m
Breath	7.7	3.7	m
Draft(Loaded)	1.55	0.8	m
Speed	25	23	kn
Indoor Passenger Seats	120	30	person
Main Engine	2×600	2×500	hp
Propulsion System	Propeller	Water Jet	-

SAR 20-1



This vessel is designed and manufactured for Search and Rescue operations. This vessel has a Mono Hull series with high maneuver and navigation performance. The hull is made of marine aluminum grade 5083 and it has strong structure and high resistance against the corrosion. The power system of the vessel contains two engines and its propulsion system is water jet. Maximum speed of vessel is 35 knots. It is equipped with central ventilation system, fuel tanks with a capacity of 3600 litters, fresh water 700 litters, internal and external firefighting system, appropriate communication system, navigation equipment, health and welfare facilities. Cruise speed of vessel is 20 knots in calm sea and weather temperature 45°C, sea temperature 32°C and relative humidity 95% during 24 hours a day. Considering the special duty of this vessel, a hook with a pulling capacity of 4 tons and a crane with a capacity of 1.2 ton are designed and installed on the vessel. The vessel is manufactured under supervision and according to the rules of classification societies.

Main Particulars		
Type of Vessel	**SAR 20 - 1**	**Unit**
Material	Aluminum	-
Length	20	M
Breadth	4.7	M
Draft (Lightweight)	0.95	M
Fresh Water Tank	700	Liter
Fuel Tank	3600	Liter
Bollard Pull	4	Ton
Crane capacity	1.2	Ton
Speed	35	Kn
Sea State	3-4	-
Main Engine	2x820	Hp
Propulsion System	Water jet	-
Endurance	500	N.M

SAR 20-2

The vessel is designed and manufactured for search and rescue operations. The vessel is designed to have especially good seagoing abilities and can operate in a sea state up to 4 with moderate speed. Environmental conditions for sailing are relative humidity 95%, air temperature 45°C, seawater temperature 32°C, the vessel can sail in the Persian Gulf, Oman Sea and the Caspian Sea.

The SAR boat's towing ability is 3 tons bollard pull, the hook is dimensioned for 3 tons of static pull. One hydraulic crane for the operation of the boat was considered with 3-meter lengths plus 1 meter.

The crew shall consist of three members, but can be increased up to 12 persons. The hull is made of marine aluminum.

The vessel was equipped with a water jet system. The maximum speed of the vessel is 35 knots and service speed is 25 knots. The fuel oil capacity shall be sufficient to provide a range of 500 nautical miles in operation with a max speed of 25 knots, therefore fuel oil capacity is approx. 5000 litters and freshwater capacity is approx. 500 liters.

Main Particulars		
Type of Vessel	**SAR 20 - 2**	**Unit**
Material	Marine Aluminum	-
Length	19.35	m
Breadth	4.6	m
Height	2.85	m
Draft	1.25	m
Fresh Water Tank	500	Liter
Fuel Tank	5000	Liter
Bollard Pull	3	ton
Speed	35	kn
Sea State	6-8	-
Main Engine	2×1100	hp
Propulsion System	Water jet	-
Endurance	500	N.M

Hovercraft

The Uness 22 is fully amphibious hovercraft which is capable of transporting up to 16 servicemen or equal weight of freight. The main structure is out of aluminum and the power is provided by a single air-cooled diesel engine.
The craft is capable of operating in wind speed up to 7m/s and oversea conditions with waves up to 1m high (Sea State 1).
Due to the highly responsive characteristics of the flexible skirt system, the quality of ride and performance over rough water is good. It can reach a speed of 40 knots.

Main Particulars			
Type	Uness 6	Uness 22	Unit
Length	5.6	12	m
Beam	2.6	5	m
Height	1.7	3.2	m
Hover Height	0.3	0.75	m
Capacity	5	16	person
All-up weight	700	7,200	kg
Velocity	40	40	knot
Engine power	165	500	hp

Multipurpose Patrol & Sports Boats 10M & 11M

10M is a fast patrol boat with good maneuvering in calm sea conditions. It can reach a maximum speed of 60 knots. It has 2x350 hp outboard engines. The structure and hull are made of fiberglass. This vessel can operate in tropical weather.
11M is a fast patrol boat with the capability of maneuvering in different sea states with a 2x350 hp outboard. It can reach a maximum speed of 53 knots.

Main Particulars			
Type	**10 M**	**11 M**	**Unit**
Length	10.4	10.7	m
Breadth	2.3	2.5	m
Height	1.6	1.3	m
Draft	0.6	0.6	m
Light weight	4.5	4.2	ton
Engine power	2 x 350	2 x 350	hp
Speed	60	53	kn
Endurance	250	200	N.M
Crew	4	3	person

Multipurpose Patrol & Sport Boats 17M & 8M

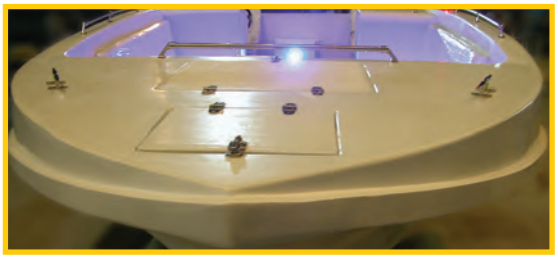
17M is a vessel made by fiberglass with 2x1200 hp engines and propulsion systems. The vessel has good performance & reliability that can reach a maximum speed of 65 knots.
8M is a fast patrol boat with high performance & special characteristics. This boat has a good ability for maneuvering in calm water and wave. It is powered by 2x250 hp outboard engines. It can get a maximum speed of 51 knots.

Main Particulars			
Type	**17 M**	**8 M**	**Unit**
Length	16.5	7.9	m
Breadth	3.7	2.4	m
Height	2.5	1.3	m
Draft	0.80	0.5	m
Light weight	13.95	1.8	ton
Engine power	2 x 1200	2 x 250	hp
Speed	65	45	kn
Endurance	400	100	N.M
Crew	5	4	person

Recreational Boats

These 5-20 meters Leisure Boats are designed and manufactured for exciting tours for tourists & passengers at sea, river & around islands (ponds….) & water sports. The main structure is made of composite or marine aluminum according to the rules of the Classification Society.

Negin

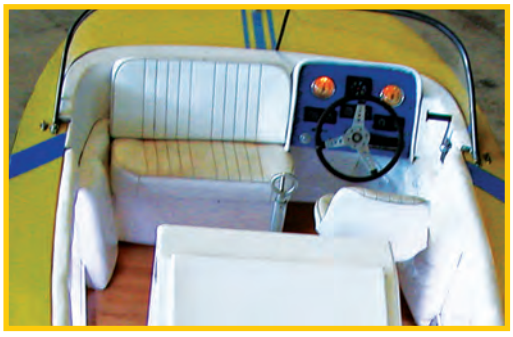


Morvarid

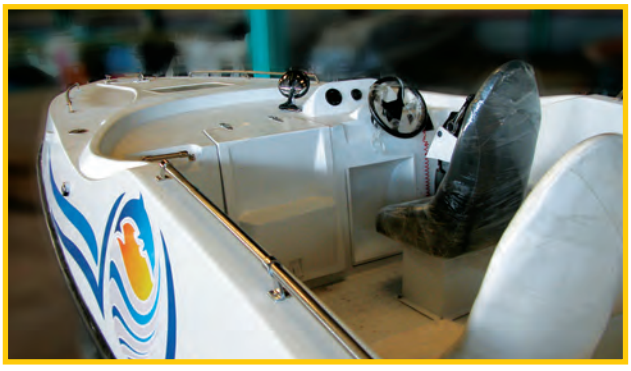
Dolphin

Main Particulars				
Title	Morvarid	Dolphin	Negin	Unit
Length	6.7	10.5	10.3	m
Breadth	2.6	2.9	2.5	m
Height	1.3	1.1	1.7	m
Main Engine	1x200	2x250	2x250	hp
Maximum Speed	30	40	45	kn
Material	Composite	Composite	Composite	-
Passenger	7	3	10	person

Recreatianal Boats



Nasim

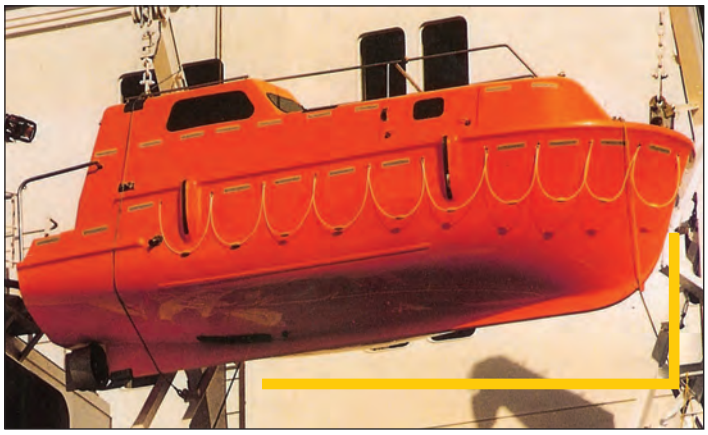


Marjan

Sadaf

Main Particulars				
Title	Sadaf	Marjan	Nasim	Unit
Length	8.3	7.9	5.1	m
Breadth	2.9	2.4	2	m
Height	1.5	1.2	1	m
Main Engine	2x250	2x200	1x350	hp
Maximum Speed	35	42	30	kn
Material	Composite	Composite	Composite	-
Passenger	8	4	3	person

Fire Resistant Rescue Boat



The main application of the lifeboat is for rescue operations on the offshore platforms and all of the vessels. The boat has been inspected and approved by classification society from a quality point of view.

This vessel has a sealed cockpit with a capacity of 32 seats and is designed and manufactured to rescue a maximum of 32 persons from emergency conditions.

The vessel can be used for 8 minutes to rescue the crew.

All the hatches of the vessel will be closed during the rescuing and the needed oxygen for the crew will be provided by the oxygen capsules inside the vessel.

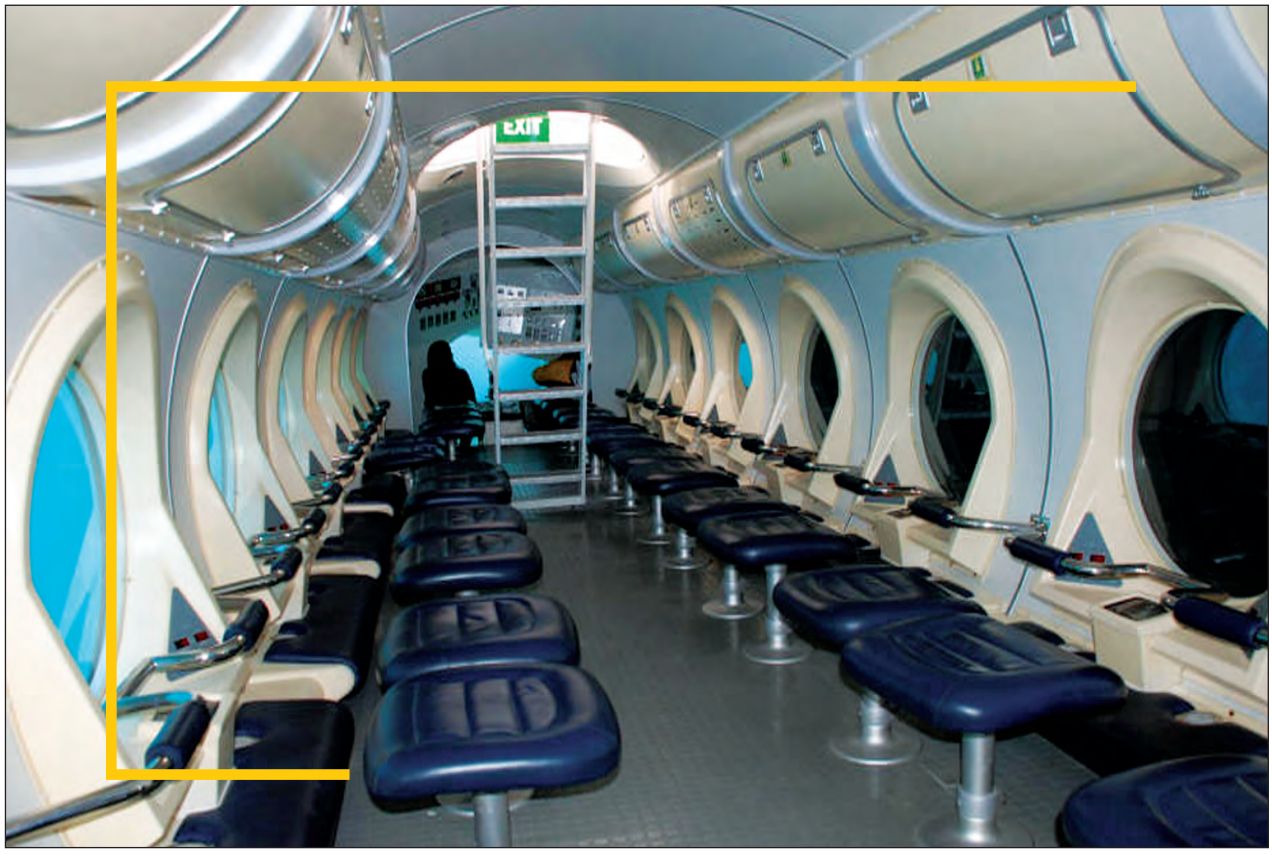
The fire-resistant rescue boat is equipped with the advanced internal and external communication, electronic, warning system to send signals which are used to ask for help in emergency states. All the internal equipment is according to the rules of SOLAS.

The power is provided by one 29 HP engine. The fire-resistant rescue boat is designed as if it is overturned for any reason, the vessel would be able to turn back to the primary state. If the engine of the vessel is broken down for any reason, it would be possible to use the oars inside the vessel.

The speed of the vessel is 6 knots.

Main Particulars		
Type of Vessel	**Fire resistant rescue boat**	**Unit**
Material	Anti-Fire Fiberglass (Resistant 8 minutes)	-
Length	6.5	m
Breadth	2.25	m
Depth	0.75	m
Sea State	4-5	-
Passenger	32	person
Speed	6	Kn
Main Engine	29	hp
Range	100	N.M

Tourist Submarine



The submarine was proposed for developing the tourism industry and it is under construction by MIO's experts which is under the supervision of the international classification institute. The submarine includes equipment such as:
Telecommunication and wireless system, underwater telephone, welfare, facilities security, and rescue facilities.

Tourist Submarine		
Title	Content	Unit
Length	12	m
Breadth	2.4	m
Height	2.7	m
Overall weight	40	ton
Passenger	24 people + 2 crew	-
Max operational depth	50	m
Propulsion system	Electrical Thruster	-

Recompression Chamber

The recompression chamber is the essential equipment to pressurize and depressurize on divers. These kinds of equipment is utilized for depth divers and also operated to depressurize the divers after diving. The other types of recompression chambers are designed for medical cares, which can be helpful for variety of illnesses such as: burn recovery, sore muscles, medical injuries and etc... .

Specifications					
Type	One- Person	Two -Person	Six -Person	12 -Person Medical Chamber	Unit
Overall length	2245	2720	4180	7000	mm
Interior Diameter	450-600	1200	1500	1500	mm
Entrance Diameter	550	1220	1540	2000	mm
Overall height	1062	1062	1670	2400	mm
Overall Volume	380	1700	5800	11800	lit
Material	Aluminum Alloy	Aluminum Alloy	Carbon steel	Carbon steel	-
Weight	148	550	3650	13000	kg

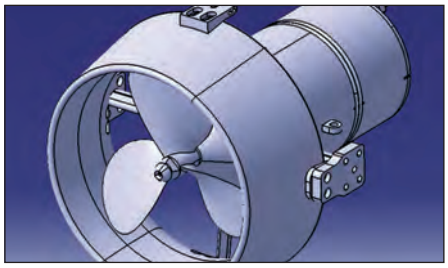
Autonomous Underwater Vehicle (AUV)

An Autonomous Underwater Vehicle (AUV) is a robot that travels underwater without requiring input from an operator. AUVs constitute part of a larger group of undersea systems known as unmanned underwater vehicles that can operate in deep and shallow water.
In summary, the AUV-Float mission is:

- Preparing films, photographs and geographic maps of the seabed and ocean floor,
- Inspection of shore and offshore structures and platforms,
- Visiting the hull and spillway of the dams,
- Inspecting Inside Pipelines with Large Diameters,
- Searching for submarines, aircraft, ships and other sunken objects.

Tourist Submarine		
Title	**Content**	**Unit**
Length	150	cm
Weight	30-40	Kg
Items to carry	- Camera - Navigation equipment - Sonar detection	-
Data detection	By Acoustic and video and Flash memory	-
Speed	3 - 7	knot

Thruster



Thruster is an independent propulsion system which is mounted on various vessels, including ships, small submarines,AUV&ROV,andrecreational submarines.

Thruster types
- Electric axial thrusters
- RIM DRIVEN electric thrusters
- Electro Magnetic thrusters

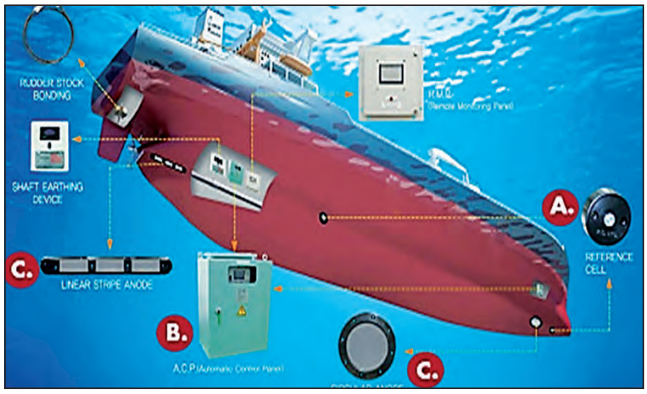
Thruster		
Type	**Content**	**Unit**
Thrust	150-200	kgf
Input Power	8-10	kw
Speed of Propeller	0-1200	rpm
RH/LH	RH/LH	--
Voltage input	150-200	V
Weight	80	kg
Depth Rating	100	m
Max Diameter Nozzle	500	mm
Length	800	mm
Current	0-75	Amper DC

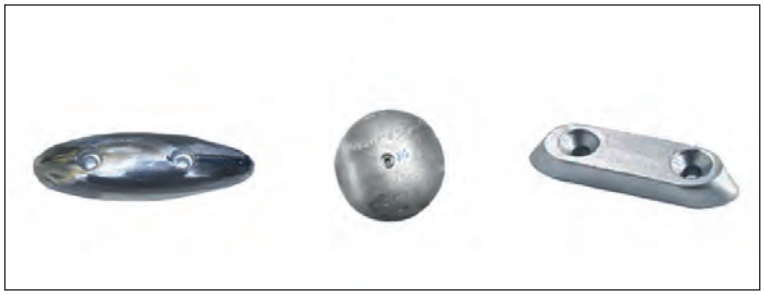
Diver Chariot

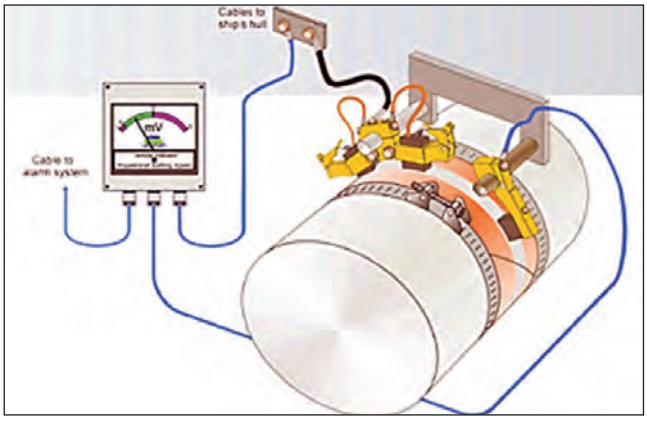
Diver Chariot		
Title	**Content**	**Unit**
Max. Capacity	2	People
Max. Operational Depth	50	m
Max. Speed	3	knt
Endurance	15	km

The diver's chariot is one of essential equipment for carrying divers in depth. Due to limitation in volume of oxygen and metabolism of the human body, divers won't be able to dive for long distance but this apparatus assists the divers to go further more distances in a shorter time. This apparatus can be utilized for different purposes such as military, scientific and recreational.

Corrosion Protection







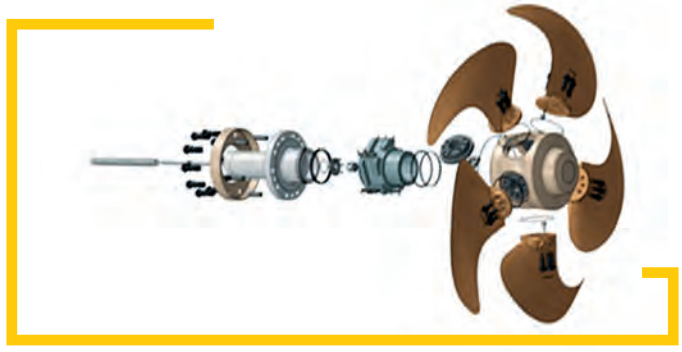
This center has modern software and facility for corrosion protection plane design. Since the marine structures and ships are considered highly valuable items, it is essential to consider appropriate actions to prevent their corrosion. The Cathodes protection by Sacrificial Anodes is one of the simplest and safest methods to reduce corrosion in the marine environment.

The operation of this type of Cathode protection system is highly dependent on the quality of the Anodes.

The sacrifice anodes include three types:

- Zinc anodes
- Magnesium anodes
- Aluminum anodes

Marine Propulsion Equipment



The MPG has to design, develop and manufacture of marine propulsion equipment for different types of ships and boats for various applications such as Commercial, Passenger, Patrol Boat, etc.

This group has several design offices, research centers, and industries for manufacturing Diesel engines, Marine Gearboxes, Propulsion systems, Propellers, and different types of marine equipment such as pumps, Marine Air condition, etc.

The following sections are the main branch of this Group:

Marine Propulsion Design Office.

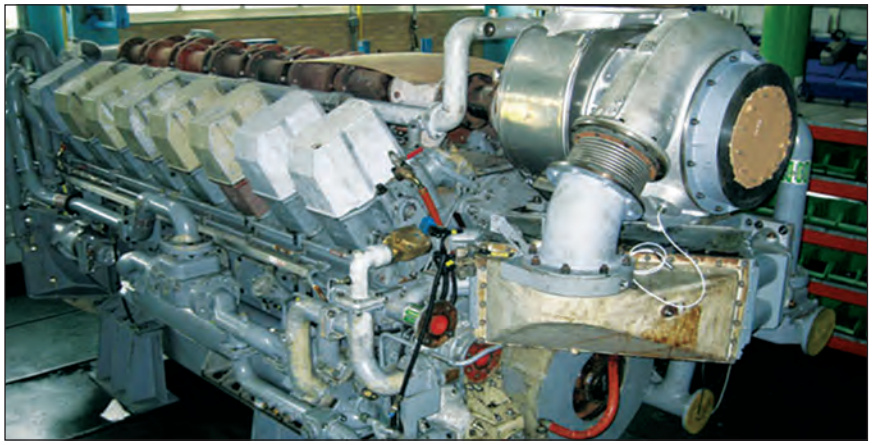
Light Diesel engine and Gearbox manufacture industry(BMI)

Marine Propulsion and Propellers Manufacture industry (TDI)

Heavy Diesel engine manufacture industry (DESA)

Marine Diesel Engine BMI 4000

Cylinders configuration	16 Cly. V 60
Rated Speed	1050 rpm
Rated Power	4250 hp
Bore	215 mm
Stroke	275 mm
Length	5575 mm
Width	2173 mm
Height	2816 mm
Direction of Rotation	CCW
Dry Weight	20300 Kg
Engine Volume	160 L
Compression Rate	13.4
Piston mean-speed	9.6 m/s
Mean effective pressure	22.6 bar

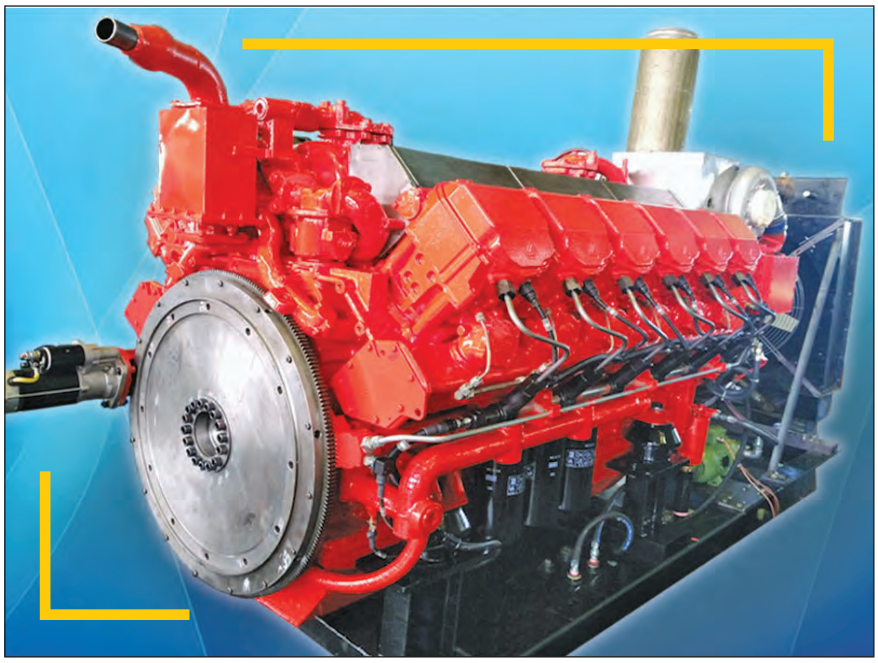


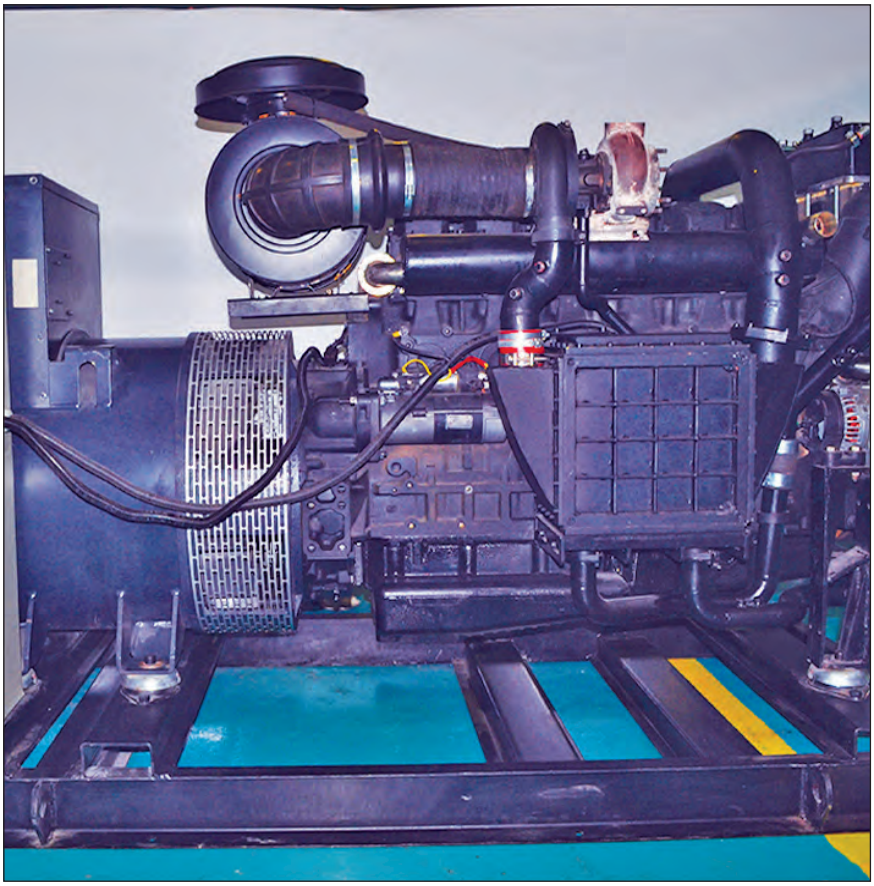
The BMI 4000 is an indigenous upgraded diesel engine which is re- designed and also reproduced in our company in order to use in the vessels with medium and heavy duty application.
In this engine a rail engine is used as a base engine and upgraded and converted for marine application upon marine standards.

D87 National Engine

Max. Power	1300 kw
Cylinder	12 V type
Displacement	38017 Lit.
Rated Speed	2070 RPM
Dry Weight	3700 kg

The D87 family engines include 12 cylinder V type dual fuels, consumption 8 cylinders V type diesel and 6 cylinders in line Diesel. The D87 is complete Iranian engine patent. These engines are capable to be used in marine, Rail ways, power generators and other applications..



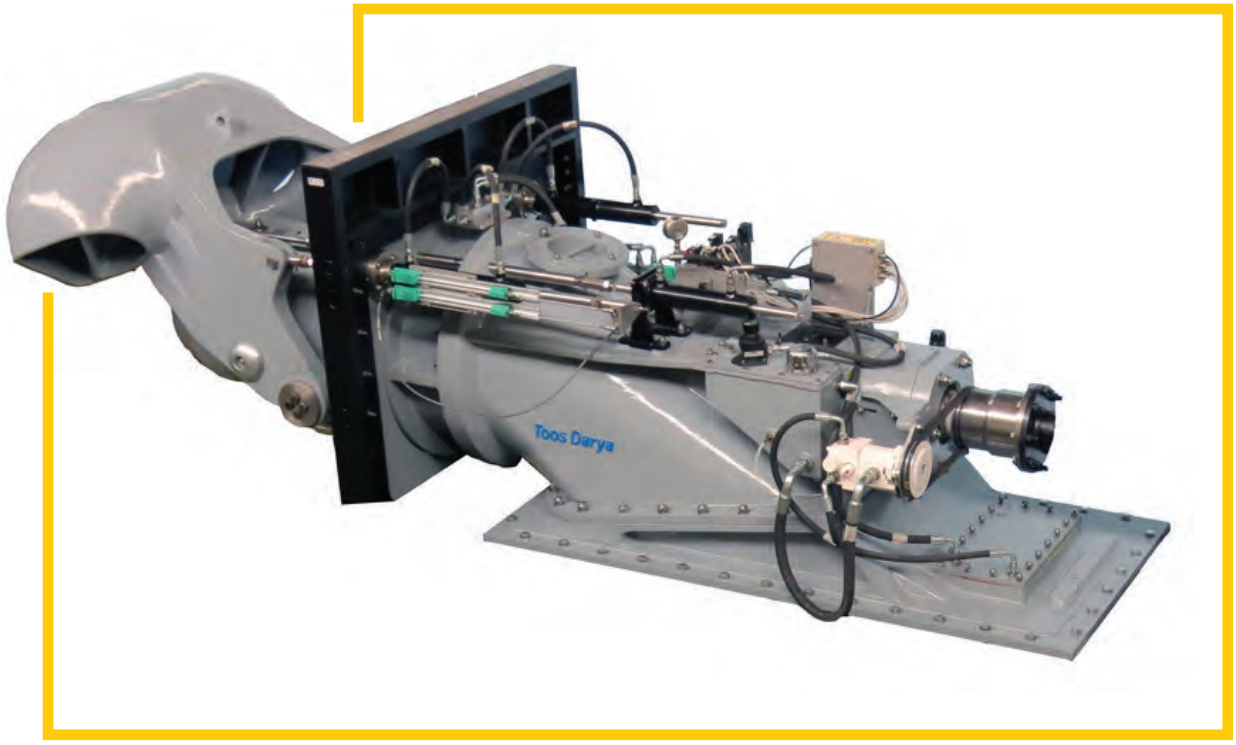


Gen-set BMI G380

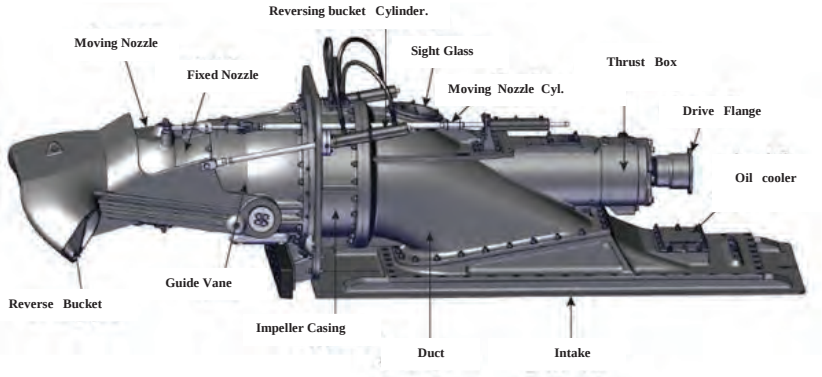
Engine Designation	BMI G380
Generator Type	Meccalte - Eco 40
Standby / rpm	380 KVA
Prime Power/ Continuous Running at 1500 rpm	343 KVA
Dry Weight	2420 Kg L2480 x W1200 x
Overall Dimensions	H1560 (mm)

The gen-set BMI G380 is an indigenous product upon the marine standards which has acceptable performance. This type of Gen-set is used to produce electrical power in marine vessels.
This production is capable for Patrol boat, Passenger boat and tug boat.

Surface-driver MTS



The water jet propulsion system is used in a large domain of powers for many ships.
It works basically like an axial flow pump. The fluid (water) is suctioned through inlet and discharged through a nozzle with high velocity . these changes in momentum create the propulsion force.

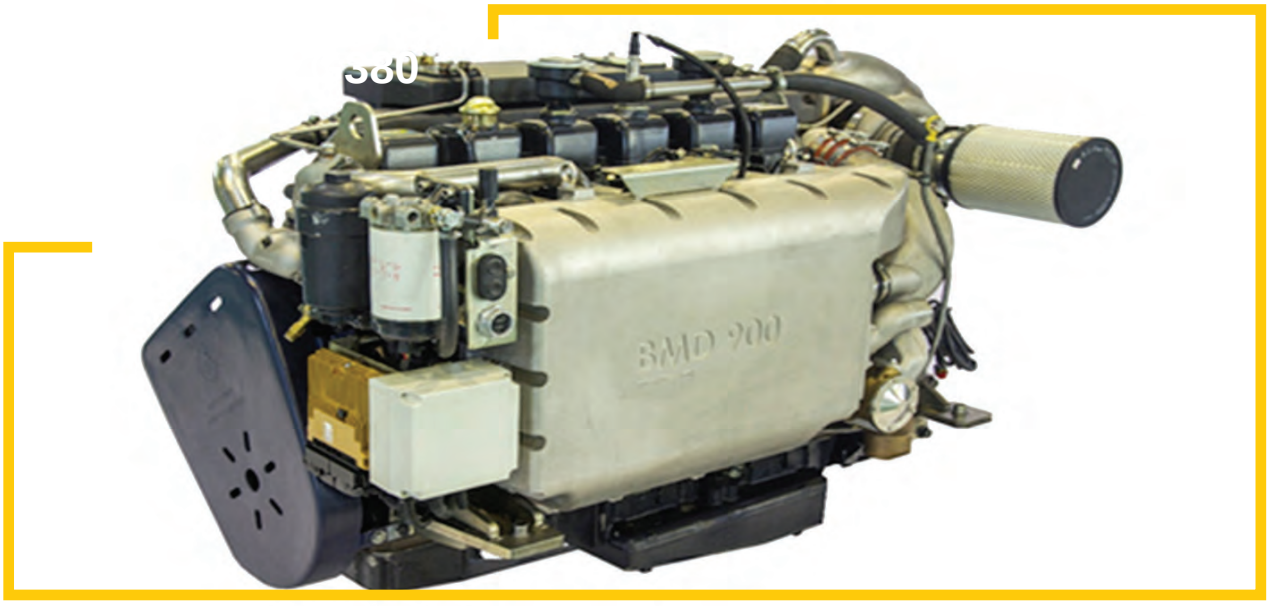


Characteristics	Limits
Rev. Speed	1600 rpm
Power	1100 kW
Weight	1100 kg
Length	3520 mm
Width	1160 mm
Height (reverse bucket up)	1100 mm
Impeller Dia.	525 mm
Blade No.	5
Direction of rotation	C.W.
Impeller Materials	St. Steel
Body Materials	Al.
Drive Flange Dia.	225 mm
Screws Pitch Circle Dia.	196 mm
Spigot Dia.	140 mm

Surface-driver MTS

Marine Tech, Surface-drive, designed by MIO Iranian engineers, to use in all high-speed craft. It has two types of designs that make it suitable for all kinds of boat transom.
MTS can be used for all types of coastal guard or recreational craft as well by choosing the appropriate gear ratio and propeller it can match the respective hydrodynamic characteristics of the hull and the performance characteristics of the engine.

Marine Diesel Engine BMD 900



Engine configuration	6 cyl. in line
Cylinder Bore / Stroke	128/ 155 mm
Engine displacement	12 lit
Max Power @ 2600 rpm	622 kw (900 hp)
Max torque @ 2150 rpm	2500 Nm
Compression Ratio	14.8
Control System	ECU
Revolution Direction (From Fly. view)	CCW
Dry Weight	1300 kg

BMD 900 is an indigenous upgraded diesel engine that is re-designed and also reproduced in our company to use in the vessels having necessity power of about 900 hp. This product applies to high-performance vessels and also used in A1 marine areas. The main characteristics of this product are as following:

- Improvement in the design of heat exchanger.
- Constant torque in various engine speeds.
- Capable to work in adverse sea conditions.
- Electric starter with 24 V.
- Improve the design of ECU.

Connectors

Generic electrical connectors
Series I
Circular electrical connectors with push-pull coupling mechanism for general specification
Series II
Circular electrical connectors with Quick disconnect coupling mechanism for general specification
Series III
Circular electrical connectors with threaded coupling mechanism for general specification
* Material
• Contact material: Copper or Copper Alloy
• Contact coating: gold plated following MIL-DTL-45204, .000050 inches (50 microinches) (0.00127 mm) minimum, over a suitable underplate
• Insert material: high-grade dielectric having a hardness, electrical, and mechanical characteristic suitable for the purpose intended.
• Material and finish for shells: Aluminum alloy with electroless nickel plating following ASTM B733, Anodic Coatings, Cadmium plate following SAE-AMS-QQ-P-416 over a suitable underplate.

Connector

Generic Connector Series I

Circular electrical connectors with push-pull coupling mechanism for general specification

Ordering information

Generic Connector Series I	Shell size (See page16)			Shell type: T: Cable Plug Z: Wall mount		Plating: W: Olive Green Cadmium L: Nickel Electroless A: Anodize	
HC	11	E	- 08	04	T	P	L
Series prefixes		Service class: E:environmental		Contact Arrangement (See page 17)		Mating end: P: Pin Contact S: Socket Contact	

Generic Connector Series II

Circular electrical connectors with Quick disconnect coupling mechanism for general specification (aviation series with Mil-c-26482)

Ordering information

Generic Connector Series II	Shell size (See page 20)			Shell type: T: Cable Plug Z: Wall mount F: Wall mount wide flange		Plating: W: Olive Green Cadmium L: Nickel Electroless A: Anodize	
HC	B21	E	- 08	04	T	P	L
Series prefixes		Service class: E:environmental		Contact Arrangement (See page 21)		Mating end: P: Pin Contact S: Socket Contact	

Generic Connector Series III

Circular electrical connectors with threded coupling mechanism for general specification

Ordering information

Generic Connector Series III	Shell size (See page 24)		Shell type: Z: Receptacle T: Cable Plug with straight Backshell R: Cable Plug with Right angle Backshell		Mating end: P: Pin Contact S: Socket Contact		
HC	81	E - 14	04	T	1	P	A
Series prefixes		Service class: E:environmental	Contact Arrangement (See page 25)		Backshell type: 1: Cable Clamp 2: Screen Clamp		Plating: W: Olive Green Cadmium L: Nickel Electroless A: Anodize

Series III

Submarine Cables

Longitude Water Blocking at Pressure of 40 bar.

Submarine Cables	
Conductor	Tinned Copper, Class 5
Separator	Water Blocking Yard
Insulation	EPDM
Separator	Water Blocking Yard
Shield	Tinned Copper Wire Braid
Outer Sheath	CPE
Production and test Standards	MIL 60394, ISIRI 1926-4

Marine Power Cables

Cable Component		Standard
Conductor	Annealed Copper, Class 5 (tinned, when required)	IEC 60228
Fire Resistance Layer	Mica Glass Tape + Polyester	-
Insulation	HF XLPE(Rubber Compound, when required)	IEC 60092-351
Inner Sheath	LSHF	IEC 60092-353 and 359
Shield	Copper Wire Braid with 90% Coverage (tinned, when required)	IEC 60092-353
Outer Sheath	LSHF Halogen Free, Fire Resistance and Low Smoke (Rubber Compound, when required)	IEC 60092-353 and 359

Design and Production of Marine Power Cables FIRE RESISTANCE, LOW SMOKE and HALOGEN FREE

Submarine Cables	
Sample Test	Conductor Examination
	Insulation and Sheath Dimension
	Hot-Set Test
Routine Test	DC Resistance of Conductor
	Insulation Resistance at Ambient Temperature
	Voltage Test
Type Test (non-electrical)	Impact Test at Low Temperature
	Bend Test at Low Temperature
	Pressure Test at High Temperature
	Heat Shock Test
	Sheath and Insulation Ageing
	Sheath Compatibility
	Fire Resistance
	Flame Propagation
	Smoke Emission
	Halogen Free
	PH and Conductivity
Type Test (electrical)	Insulation Resistance at Room Temperature
	Insulation Resistance at High Temperature
	voltage test for 4 h

Simulators

This 6DOF motion platform can move in all of the angular or linear directions and can be used in different types of simulators and stabilizers such as ships, light, and heavy vehicles, tanks, trains, and various airplanes.

- Possibility of usage as equipment's stabilizer.
- Full motion simulation of carriers to achieve a real sense of motion.
- Programmable for different motion status.
- Controlled by specially designed software.
- Motion and maneuver in 6 degrees of freedom (Roll, Pitch, Yaw, Heave, Surge, Sway).
- Designable with electrical, hydraulic, or pneumatic actuators.
- Modular and extendable design (Technical specifications can be customized).
- Reliable and safe design using hardware and software solutions.

Easy installation, initialization, operation, and maintenance.

Full mission train driving simulator consists of driver cabin with all its internal equipment, 6 DOF motion platform, instructor station, technical room and debriefing room. Equipment of train's driver cabin in simulator are similar to main equipment. Cabin is installed on a motion platform and train's motion simulate physically by the motion platform. Train environment and stations are implemented visually around the cabin and trainees can see environment inside windows.

This simulator covers all the essential areas of training in full compliance with training requirements and can be used for training of different train applications such as passenger transportation between cities, subway, monorail, LRV, etc

Simulators

The Full Train Driving Simulator consist of cabin with all of its internal equipment, 6 DOF motion platform, instructor station, technical room and debriefing room. Equipment of train's driver cabin in simulator are similar to main equipment. Cabin is installed on a motion platform and train's motion are simulated physically by the motion of the platform. Train environment and stations are implemented visually around the cabin and trainees can watch it through the cabin windows.

The simulator covers all the essential areas of training in full compliance with training requirements and can be used for training of different applications such as passenger transportation between cities, metro, monorail, LRV and etc.

Satellite Navigation System

GPS 2102/ GPS 3203 satellite navigation system can perform positioning with a high precision GNSS Card that is connected to GPS and GLONASS Satellite systems to work. The device can do measurement and calculate course over the ground, speed over ground, and other parameters that demand high accuracy. That is comfortable to use for Patrol cars and Ships. GPS 3203 outfit with DGPS.

- High accuracy in positioning from
- Installable on dashboard or bracket
- Low electrical power consumption
- None Sensitive for Proximity with electrical and RF Devices
- Support of NMEA0183 data
- outputs Environment IEC60945
- Standard Electronic Chart Display and Information System (ECDIS)

Parameter	Specification		Description
Model	GPS -3203	GPS -2102	----
Position Accuracy	Better Than 0.5 Meter(with DGPS)	Better Than 5 Meter	All Conditions
Channels in Work	24 Channel		Satellite In Use
Max Speed Calculated	500 M/s		Full Accuracy
Up to Date Rate	5 Hz		Data Sending Update
Serial Com Ports	4 RS422		Selectable Config.
Data Output	NMEA 0183		Standard NMEA
Start-Up Time	30 Sec		Warm-Up Time
Re _Acquisition Time	< 2 Sec		----
Shock	30 g 6 ms		Operating
Vibration	1 ~ 13.5 Hz 1 mm Movement 13.5 ~ 100 Hz 0.7g Acc.		According to IEC60945
Operation Temp	-10 °C to + 55 °C		----
Humidity	Relative %95 in +40 °C		without condensation

Display System

NCD_301 Model Navnet is designed in a compact case to monitor and control all navigation systems with I/O data ports in serial and network protocols. The device is designed to be portable and to have easy mobility and mountable on a static stand. Integrated powerful processor and display hardware help to use it in all systems for processing and monitoring devices.

- Easy to install on the dashboard, stands, and consoles.
- Supporting USB Flash Memory to save and record data.
- Input /output data ports in serial RS232 and RS422, LAN, USB2–3 protocols are available.
- Full isolation for all serial ports with separate serialgrounds.
- Support OS Windows 7,8,10 in x86-x64 and Linux.
- Saving and recording data from multi-connected devices.
- Environment IEC60945 standard.

Parameter	Specification	Description
CPU	Intel Quad Core In Physical	1.8GHz Up to 2 GHz
Memory RAM	2GB DDr3	Up to 8 GB
Input Data Protocol	NMEA 0183	And Other Protocols
Shock	30 g in 6 MS (operating)	Half sin. in 3 axis(X,Y,Z)
Vibration	1 ~ 13.6 Hz 1mm Movement 13.5 ~ 100 Hz 0.7g Acc.	In Accordance with IEC60945
Operation Temp	-10 °C to +55 °C	----
Humidity	Relative %95 in +40 °C	Non-condensation
Monitor	10"LCD Color TFT	Other Sizes Available
Weight	4 Kg	Approx.
Connections	4 Serial RS232 & RS422 D-type 9 Ports 1 LAN - 1 VGA - 3 USB2 Ports - 1 USB3 Ports AC Power Generic Socket -2 Rs422Terminal Ports	Full Port

Processing & distributing navigation information

NDD-201\NDD-102 Model Equipment is designed for processing and distributing navigation information in developed networks. All navigation systems such as Compass, Speed log, Echo sounder, and other devices with serial connection ports can connect to the NDDS for sharing data (transmit and receive data). Therefore, NDDS is a processor for all information from serial and LAN Devices to manage data and transmit to the devices in need. The powerful hardware and software of NDDS help to use it for operating easily with complete controllable in serial and network protocols for performing a reliable navigation data network plane.

- Monitor control for all serial and networks data ports in Hex/ ASCII characters
- Input /output serial data ports in RS232 and RS422 protocols are configurable
- Fast Ethernet network connections (LAN) is accessible
- Full isolation for all serial ports RS232 & RS422 with separate signal grounds
- Easy to use and operating with a big monitor and economical keyboard and trackball
- Supporting USB Flash memory to save and record data from selectable ports
- Environment IEC60945 standard

Parameter	Specification		Description
Model	NDD-201	NDD-102	----
Serial Ports	32 4 - RS232 28 - RS422	8 RS232 or RS422	Separate Ports Fully Isolated
Network	LAN		RJ 45 Socket
Monitor	LCD Display	----	>7" LCD Color
Shock	30 g in 6 ms (operating)		Half sin. in 3 axis(X, Y, Z)
Vibration	1~13.5 Hz 1mm Movement 13.5 ~ 100 Hz 0.7g Acc.		According to IEC60945
Operation Temp	-10 °C to +55 °C		----
Humidity	Relative %95 in +40 °C		without condensation
Dimension	500*700*350 mm	200*150*50 mm	Approx.
Power Supply	24 VDC & 220VAC		18 ~ 36 VDS 180 ~ 240 VAC 50/60 Hz

Navigation Radar (marine)

RAD1226/RAD1326 is the x-band radar designed on the magnetron lamp. Employed digital technology such as random PRF and pulse integration to improve SNR and decrease the CFAR. It is easy to install on the sea traffic stations and big boats.

- Advanced signal processing for improved detection
- Automatic plotting/tracking of 100 targets manually or

Automatically acquired

- Easy operation by customizable function
- Built-in self-test systems
- Sector blanking ability
- Environment IEC60945 standard
- Record/playing data and event at the hard
- Driving on the radar processor

Parameter	Specification			Description
Model	RAD-1226	RAD-1326	RAD-1327	----
RADAR Frequency	X Band Frequency			9410 MHz ±40
Transmit Power	12.5 kW	25 kW	25 kW	Pike Power Transmit
Band Widths	40 MHz			----
Range (min -max)	100m-72 Nm	60m - 96 Nm	30m - 132 Nm	Detection and Track
Antenna / Rotation	Slotted Array - 6.5 foot			24/48 PRM
Range Accuracy	1 % Range & 100 m			----
Bearing Accuracy	From 0.3 to 1 ° RMS			Depending to target
Shock	30 g in 6 ms (operating)			Half sin. in 3 axis(X, Y, Z)
Vibration	1 ~ 13.5 Hz 1 mm Movement 0.7 g (5 to 500 HZ)			According to IEC60945
Operation Temp	-10 °C to + 55 °C			----
Humidity	Relative %95 in +40 °C			without condensation
Power Supply	24 V, 20 A			
Display	15/17/19"			

Data Display System (Gyro Compass)

REP-151 is repeater to indicate simultaneously data for two compass heading (namely Roll, Pitch, and Heading). That's adjusted to carry out data from one input to another output.

• Input /output serial data ports in RS232 and RS422 protocols are configurable

• Full isolation for all serial ports RS232 & RS422

• Enjoying adjustable brightness for panel illuminations, REP- 241 is a compass heading tape repeater designed on dot-matrix to demonstrate true heading in 000 to 360 degree with one digit decimal. It works based on NMEA0183 serial connections protocol

• Low electrical power consumption

• The two-way power supply in AC and DC voltage

• Enable to keep the correct performance in carrier dynamics

• Adjustable brightness for panel illuminations

• Full isolation for all serial ports RS232 & RS422 with separate signal grounds

• Environment IEC60945 standard

Parameter	Specification		Description
Model	REP - 151	REP -241	----
Name	Gyro Indicator	Gyro Repeater	----
Serial Ports	2 Input Ports And 1 Output Port Isolated		RS232 & RS422
Power Supply	24 VDC		18-30 v Dc
Input Data Protocol	NMEA 0183		$--HDT , $--PRDID , ...
Shock	30 g in 6 MS (operating)		Half sin. in 3 axes (X, Y, Z)
Vibration	1~13.5 Hz 1mm Movement 13.5 ~ 100 Hz 0.7g Acc.		According to IEC60945
Operation Temp	-10 °C to +55 °C		----
Dimension	210*100*80 mm		W *D* H Approx.
Weight	3 Kg	4Kg	Approx.

Dynamic Positioning System

Dynamic Positioning System automatically controls a vessel's heading and position by activating thrusters based upon data as received from position reference systems, gyrocompasses, wind sensors, and motion reference units. The Auto Track mode allows the ship to move along a pre-defined track at low speed as defined by the operator.
DP1 system allows the operator to automatically control the heading and manually position the vessel based on the data as received from gyrocompasses and wind sensors. DP1 system is suited e.g. supply vessels, tug boats, dredgers, cable and pipe laying vessels, FPSO's, heavy lift vessels, and mega-yachts in full accordance with LRS standard.

Key system features:

- Automatic heading control
- Automatic position control
- Wind compensation
- Positioning accuracy is 5 Meter
- Heading accuracy is 2 Degree
- DP1 system is following LRS DP AM standard

Data Pocket Logger

The data logger stores all necessary data of navigation equipment as a black box. This logger has the following specifications:

• Compatible with wide difference input data types.

• Perfect isolation of inputs.

• Possible upgrade to blast resistance.

• Possible upgrade to ping placement.

Parameter	Specification	Description
Hardware	2 Full Suplex RS422 ports \Speed: 16 Mbps 1 RS232 port\1 Mbps ESD Protection ± 15 kV For serial port Support micro SD Card/up to 4Gb Working time: up to 8 hours On/Off and Record Switch Power, Record and SD card existence status LEDs	
Power Supply	5VDC	
Input Data Protocol	NMEA 0183	
Shock	30 g in 6 MS (operating)	Half sin. in 3 axes (X, Y, Z)
Vibration	1~13.5 Hz 1mm Movement 13.5 ~ 100 Hz 0.7g Acc.	According to IEC60945
Dimension	210*100*80 mm	W *D* H Approx.
Weight	< 0.3 Kg	Approx.

Global Maritime Distress & Safety System (GMDSS)

Global Maritime Distress & Safety System (GMDSS) is a standard and mandatory equipment for all ships and oil tankers designed to automate exchanging signs of the ships' distress and safety. This system consists of different parts that are: VHF radio with the DSC capability, MF/HF radio with the DSC capability, NAVTEX receiver, handheld radios, Inmarsat satellite terminals, GPS receiver, Search and Rescue Transponder (SART), Emergency Position-Indicating Radio Beacon (EPIRB), and the AIS & LRIT equipment. ICI has designed and manufactured MF/HF, VHF, and handheld radios of the system. In addition to the radios, ICI provides other equipment of the system manufactured by international reputable companies/brands.

MF/HF marine digital radio

VHF marine digital radio

ARAS 1 Tactical Vehicle

Technical Specifications	
Overal Dimention	(5310 x 2100 x 2200) mm
Maximum speed limit	120 km/h
Maximum permissible load on the front axle (with cargo & passengers)	1500 kg
Maximum permissible load on the rear axle (with cargo & passengers)	2500 kg
Maximum gross vehicle weight	3850 kg
Pay Load	1000 kg + 2 passengers
Gradeability - Side slope	30%
Gradeability - Longitudinal Grade	60%
Fording without kit	700mm
Operating Radius (without fuel electronic unit)	600 km
Engine Model	CYQD32TI Intercooler & turbocharged
Engine Displacement	3153 CC
Maximum output power	133 hp @ 3600 rpm
Maximum Torque	313 N.m @ 2000 rpm
Emission Standard	Euro II
Gearbox	5+1 Manual
Steering System	Hydraulic-Assist Power Steering
Braking System	ABS & EBD
Suspension System	5link - coil spring on rear / 3link - coil spring on front

ARAS 2 Tactical Vehicle

Technical Specifications	
Overall Dimension	(5310 x 2100 x 2200) mm
Maximum speed limit	120 km/h
Maximum permissible load on the front axle (with cargo & passengers)	1500 kg
Maximum permissible load on the rear axle (with cargo & passengers)	2500 kg
Maximum gross vehicle weight	3850 kg
PayLoad	1000 kg + 2 passengers
Gradeability - Side slope	30%
Gradeability - Longitudinal Grade	60%
Fording without kit	700 mm
Operating Radius (without fuel electronic unit)	600 km
Engine Model	CUMMINS ISF 2.8
Engine Displacement	2800 cc
Maximum output power	174 hp @ 3400 rpm
Maximum Torque	365 N.m @ 1600- 3200 rpm
Emission Standard	Euro V
Gearbox	5+1 Manual
Steering System	Hydraulic-Assist Power Steering
Braking System	ABS & EBD
Suspension System	5 link - coil spring on rear / 3 link - coil spring on front

SEPEHR Mini Bus

Technical Specifications	
Overall Dimension	(7000*2050*2775) mm
Maximum speed limit	100 km/h
Maximum permissible load on the front axle (with cargo & passengers)	2500 kg
Maximum permissible load on the rear axle (with cargo & passengers)	4200 kg
Maximum gross vehicle weight	6100 kg
Engine model	Nissan - ZD30D13-4N
Engine Displacement	3 Lit
Maximum output power	91 kW @ 3100 rpm
Maximum torque	380 N.m @ 1600 rpm
Emission Standard	Euro IV
Gearbox	ZF 5S400 - 1700010-FF48
Steering system	Hydraulic with high set out
Braking system	EBD -ABS
Front suspension	Flat spring + stabilizer
Rear suspension	Flat spring
Passengers	17+1

SEPEHR Mini Bus (2 Doors)

Technical Specifications	
Overall Dimension	(7280*2130*2310) mm
Maximum speed limit	110 km/h
Maximum permissible load on the front axle (with cargo & passengers)	2500 kg
Maximum permissible load on the rear axle (with cargo & passengers)	4200 kg
Maximum gross vehicle weight	6100 kg
Engine model	Nissan - ZD30D13-4N
Engine Displacement	3 Lit
Maximum output power	91 kW @ 3100 rpm
Maximum torque	380 N.m @ 1600 rpm
Emission Standard	Euro IV
Gearbox	ZF 5S400 - 1700010-FF48
Steering system	Hydraulic with high set out
Braking system	EBD -ABS
Front suspension	Bullion spring with three layers on the front & desire balance
Front Axle	DONGFENG DANA - 3000010-FF27
Rear suspension	Spring with 4 layers behind bars
Rear Axle	DONGFENG DANA - 2400010-FF42
Passengers	16+1

SEPEHR Middle Bus

Technical Specifications	
Overall Dimension	(7930*2250*3120) mm
Maximum speed limit	105 km/h
Maximum permissible load on the front axle (with cargo & passengers)	3000 kg
Maximum permissible load on the rear axle (with cargo & passengers)	6000 kg
Maximum gross vehicle weight	9000 kg
Engine model	Cummins - ISDE 160/31-with Turbocharged
Engine Displacement	4500 cc
Maximum output power	118 kW @ 2500 rpm
Maximum torque	600 N.m @ 1200-1700 rpm
Gearbox	ZF S5-42/5.72
Steering system	HEMA-hydraulic
Braking system	(s-4M4) Full pneumatic ABS
Front suspension	stabilizer+parablic leaf spring + shock Absorber
Rear suspension	stabilizer+parablic leaf spring + shock Absorber
Passengers	26+1

SEPEHR BI457 Urban Bus

Technical Specifications	
Overall Dimension	(12280×2600×3360) mm
Maximum speed limit	82 km/h
Maximum permissible load on the front axle (with cargo & passengers)	7500 kg
Maximum permissible load on the rear axle (with cargo & passengers)	11000 kg
Maximum gross vehicle weight	18000 kg
Engine model	BENZ - OM457 LA.V
Engine Displacement	11.97 Lit
Maximum output power	260 kW @ 2000 rpm
Maximum torque	1600 N.m @ 1100 rpm
Emission Standard	Euro III
Gearbox	ZF - ECOLIFE 6 AP 1700 B (Automatic)
Gear ratio	3.36 , 1.91 , 1.42 , 1.00 , 0.72 , 0.62 - R 4.24
Steering system	HEMA-hydraulic
Braking system	ABS,ASR
Front suspension	4 Shock absorber + stabilizer + 2 Air bellows + ELC
Rear suspension	4 Shock absorber + stabilizer + 2 Air bellows + ELC
Passengers	38+1

CITY LOW ENTRY Bus (BENZ)

Technical Specifications	
Overall Dimension	(12300×2580×3235) mm
Maximum speed limit	80 km/h
Maximum permissible load on the front axle (with cargo & passengers)	7500 kg
Maximum permissible load on the rear axle (with cargo & passengers)	11000 kg
Maximum gross vehicle weight	12100 kg
Engine model	BENZ - OM457 LA.V/2
Engine Displacement	11.97 Lit
Maximum output power	265 kW @ 1900 rpm
Maximum torque	1850 N.m @ 1100 rpm
Emission Standard	Euro V
Gearbox	ZF - ECOLIFE 6 AP 2000 B (Automatic)
Gear ratio	3.36 , 1.91 , 1.42 , 1.00 , 0.72 , 0.62 - R 4.24
Steering system	HEMA-hydraulic
Braking system	Two Orbit with ABS, ASR
Front suspension	2 Shock absorber + stabilizer + 2 Air bellows + ELC
Front Axle	ZF RL85A
Rear suspension	4 Shock absorber + 4 Air bellows + ELC
Rear Axle	ZF A 132
Passengers	28+1

INTERCITY Bus (MAN)

Technical Specifications	
Overall Dimension	12600*2550*3820 mm
Maximum speed limit	110 km/h
Front axle capacity	8000 kg
Rear-axle capacity	13000 kg
Maximum gross vehicle weight	19500 kg
Engine	MAN D2066 LOH 40
Emission standard	Euro5-EEV5-SCR(AD BLUE imjetion)
Engine Displacement	10.5 liter
Maximum output power	440hp/1900rpm
Maximum torque	2100 N.m / 1000-1400 rpm
Gearbox	ZF-AS Tronic 12AS 2301 BO
Gear ratio	12.33 ~ 0.78 R11+1
Steering system	ZF- Hydraulic
Brake system	wabco - EBS (ABS,TCS)
Front suspension	INDEPENDENT AXLE / 2Air bellow/8 shaft tool head
Rear suspension	Shaft V shape
Passengers	26+1+1(vip)/44+1+1
Other facilities	ESP,LGS,EBA,ACC,Cruise control

Civil Tire (LT & TB)

• DT2001: Has a long operation, torsional strength, and good braking on most roads for vehicles LT.
• DT2002: Designed for use in the automotive drive shaft LT, has a high resistance to abrasion, harpist power, braking, and excellent pull.
• DT2005: Designed for use in steering and drive axle vehicles TB.
• DT2010: Designed to fit the steering axis and long-lived and resistant TB drive vehicles over rough roads.

Inflation Pressure at MaxLoad (Psi/Kg)		Rim size(in.)	Pattern No.	Ply Rate	Size Tire
D:60/966	S:60/1102	16	DT-30	10	7.00-16
D:60/975	S:60/1110	16	DT-2001	8	7.50-16
D:90/1240	S:90/1400	16	DT-2002	12	
D:90/1300	S:90/1490			14	
D:85/2050	S:95/2335	20	DT-2005	14	9.00-20
D:90/2405	S:100/2740	20	DT-2000	14	10.00-20
D:105/2635	S:115/3000			16	
D:95/3080	S:105/3510	20	DT-2010	16	12.00-20
D:105/3270	S:115/3730			18	
D:95/3460	S:105/3855	24	DT-2000	16	12.00-24
D:105/3674	S:115/4187			18	

D= Dual S= Single

Corpse Transport Conex

General Specifications

• Cabin approx. dimensions: 4800x2200x2100 mm (LHW)
• Transport capacity: 12 corpses
• Body plate: Galvanized color plate (outer and inner covering made of pre-painted sheet)
• Drawers" material: Fiberglass, frame and main structure of drawers made of steel Thickness of wall 80mm, floor 100mm, and roof 80mm
• Provided with 3 double-leaf doors on co-driver side completely airtight, and fitted with lock and height from floor to roof and access to chambers through each leaf of doors
• Body insulation: of sandwich panel type with polyurethane foam
• Cabin floor: Structure frame made of channel frame, middle supporting section box, and insulating foam.
• Outfits: Made of steel
• Floor made of ordinary steel
• Refrigerating unit: Unit with refrigerating capability from +10 to -20 degree with an alpha two-stroke motor and or similar type with the capability of ceiling installation

Refrigerator Mounted Conex

Specifications Of Refrigerator-Mounted Conex

1. Approximate dimensions; 480x220x220 (LxWxH)
2. Degree of refrigeration; Refrigeration provided from -20 to +10 Celsius degree is adjustable and incorporates defrost system
3. Cab plate; Sandwich type with 2 upper layers of pre-painted Al-Zinc, 0.6mm thickness, and injected substance of polyurethane insulator of 40kg density
4. Walls and roof 10cm in thickness
5. Floor 15cm in thickness and floor plate made of rail type aluminum
6. A digital thermometer is provided inside the driver cabin for control of the degree of refrigeration so that driver can notice any temperature changes in the refrigeration compartment using such a control system.
7. A rear door of double leaf and hinged type with lock and made of chrome or steel and special rubber gasket on the door sides for sealing and prevention of waste of cold are utilized.
8. The refrigerating unit is of Omega and/or similar brands. The unit is of two-stroke types and operates above and below zero with the capability of connection to city mains 50 Hz and 220 V and or powered by vehicle engine together with cable and two plugs.
9. The refrigeration cabin is equipped with a lighting system.
10. Provided with a ladder for a roof inspection.

Four- Wheeled Motorcycle

General specifications

Assistance-touch motorcycle system ATV (Assistance-Touch Vehicle) is designed and manufactured for quick and reliable access to different kinds of relief - touch equipment at very high maneuverability and mobility and is capable to negotiate obstacles and impassable areas in the course of crisis (earthquake, flooding, urban and forest fires, operations, etc.). This system provides the capability of tactical installation of other different systems such as firefighting, reconnaissance, combat, and command ones.

Radio communication facilities of the system powered by power supplies of auxiliary equipment, various input IPM such as solar panels, power generator, motor dynamo, micro charger, limiter convertors, and sealed lead-acid batteries, provides the capability to establish a stable and secure contact between military and disciplinary or law enforcement centers, red-crescent rescue and relief organization, hospitals and so on and its fire-fighting and relief equipment are very effective and useful for the containment of urban and forest fires simultaneous with quick presence in the crisis areas for providing relief.

The 4 and 6 wheeled motorcycles ATV 500 ATV 800, ATV 1000 can be provided with different kinds of systems as follows:

1. System of communication equipment;

Radio set AM -HF
Radio set FM-VHF
Radio set FM-UHF
Cellphone –based tracking system
GPS
Pictures transmission system
Sound alarming and warning system
Communication helmet PTT

2. System of relief equipment;

Bag of First aid kit and medical life restoration
Foldable stretcher 4-seg
Life detector device
Camping tent
Telescopic ladder 2m
Co^2 cylinder
Shovel and pick, saw and 4-purpose knife
Firefighting clothes

3. System of electric and electronic equipment;

Solar panel
Power supply IPM
Convertor 12/24 (15A)
Micro-charger
Sinus USP (220V AC)

Sealed lead-acid battery 120AH
Power generator 800W
Convertor-limiter 3A

System of reconnaissance-combat equipment;

Range finder laser alarm
Night thermal vision device
Image transmission system
Navigation system

Technical Specifications of 4-wheeled motorbike	
Model	TMEC 800 ATV
Length	2980 mm
Width	1430 mm
Height	1885 mm
Wheelbase	1830 mm
Rear and front	Front: Twin-A arm independent suspension Rear: Twin-A arm independent suspension
Suspension system	Front: Hand Break, Foot Break (Disc Break) Rear: Hand Break, Foot Break (Disc Break)
Brake system	F: AT 14 x 7.0
Front and rear tire size	R: AT 14 x 8
Curb weight	556 kg

Technical Specifications	
Type of Engine	4-Stroke, SOHC, Coolant- Cooled
Cylinder Design	Single-Cylinder
Carburetor	MIKUNI BSR36 – 89
Compression Ratio	10.3:1
Rated Power	24Kw / 7000 rpm
Max. Torque	36n.m / 5500 rpm
Oil Capacity	2.2 L
Starter System	Electric and Mechanical

Engine Specifications	
Model	TMEC2V91
Type of Engine	4-stroke,SOHC.EFI, Coolant Cooled
No. of Cylinders	2-Cylinder
Stroke & Bore	91 x 61.5
Compression ratio	10.3:1
Engine Displacement	800 cc
Type of Ignition	ECU
Type of Fuel (Octane)	90
Starter System	Electric and Mechanical

Railway Transportation Industry

Capabilities:

• Production of various freight wagons (flat, covered, rail tanker, ballast, etc.)
• Production of passenger wagons
• Production of metro wagons
• Production of ore wagons
• Design and production of rolling stock [rail traction unit (truck mobile), wagon hoist jack, hydraulic point machine, etc.]
• Production of various fixtures for assembling and welding body of freight and passenger wagons Repairs and overhaul of various freight wagons and interior decorations of passenger wagons. Manufacture and
• production of various bogies for passenger wagons, locomotives, freight wagons, metro wagons, etc.
• CNC precision and heavy machining up to tonnage of 100

Simulators for Driving Road Construction Machines

Description of products:

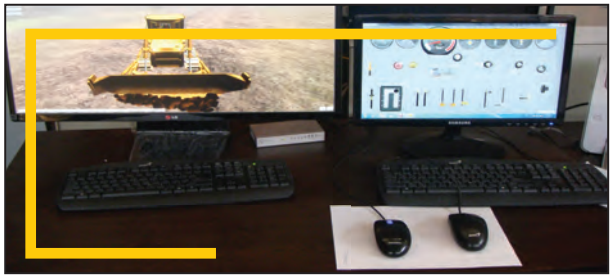
These simulators are intended for training and enhancement of theoretical and practical knowledge of the bulldozer and loader drivers and also improvement of operational skills in different scenarios.

Technical specifications of simulators

• Simulator cab: Including driver's work station.
• Software: Capable of creating and providing a field of view and training scenario with the score evaluation system.
• Hardware: Interface circuits, digital and analog input and output cards, and computerized equipment.
• The user-friendly interface in the Persian language.
• 100 % localized knowledge-based design and installation.
• Selection of different training scenarios and the possibility to make changes by the trainer.

Static simulator for driving Bulldozer, Model D155A-1

Static simulator for driving Loader, Model W90-2



Features and capabilities of simulators

• Decreased the cost of fuel, excessive use of vehicles, and reduced minor expenditures.
• Familiarization with equipment, their function, and arrangement in the related cabin;
• Acquisition of skills in operation and deactivation of equipment and their preparation.
• No need for any time consuming necessary coordination and prediction of unexpected incidents.
• Increased self-confidence and decreased stress and mental pressure of users.
• No loss of life and property resulting from errors made by personnel under training.
• Providing comprehensive training based on a uniform and fixed process beyond any personal styles.
• Possibility to do practice many times in the shortest time and without any dangers resulting from in the class environment.
• Possibility to provide training in the form of practices for vehicle inspection, switching on, control, performing different scenarios, parking, and switching off the vehicle. The ability of trainers to make an intentional error.
• Possibility to provide climatic conditions of urban and cross-country (mountain, desert), day and night time, four seasons, and weather conditions (fog, rain, and snow) within the shortest possible time.
• Possibility to maintain readiness and enhance operational power.
• Possibility to record crew activities and demonstrate them again for inspection of performance and observation of any mistakes.
• Demonstration and print of training results and record of scores.
• Capability to upgrade software and hardware and to improve quality and develop simulator in the future. Capability to provide support for the product on any maintenance levels, operation, and to provide related training services.
• Capability to upgrade software and hardware and to improve quality and develop simulator in the future. Capability to provide support for the product on any maintenance levels, operation, and to provide related training services.

Capabilities

• Design, manufacture, execution of ventilation, air conditioning, and smoke extraction systems in compliance with the world standards for tunnels, metro and road stations
• Design and manufacture of types of axial, centrifugal fans and jet fan for metro, tunnel, and road ventilation systems (Axial Fan, Jet Fan, Centrifugal & Smoke Type Unit F300 & F400 Thermal Class)
• Design and execution of BAS, BMS, SCADA smart control systems
• Design and execution of automated far collection systems for public transport, including metro, bus, and taxi driving systems
• Design and supply of safe traffic control system (individuals, goods, vehicles, ICT items, etc.) Design and production types of TOKEN, magnetic, non-contact, QR Code, hybrid card readers

Some Projects

• AFC system for Tehran, Tabriz, Shiraz, Esfahan, and Mashhad; lines one, two, three, four, and seven of Tehran metro
• Evaporative ventilation system for Tehran metro lines three and four and primary ventilation system for line seven
• Execution of BAS for Tehran metro lines three, four, and six
• Traffic control for Homa Airline and public organizations
• Maintenance, repair, and logistic services of BAS system and air conditioning system for Tehran metro lines
• Providing technical consultation services for execution of rectifier room ventilation system Design, supply, test, and delivery of axial fans for Tehran metro lines 6 and 7

Sanam Transportation Department

• Implementation of rail telecom for urban and railway projects
• Radio and overhead power systems
• Transport Department of Sanam Industrial and Commercial Holding is active since 2007 in various designing and engineering services, the supply of goods, installation and commissioning, supervision and technical support, consultation and feasibility study of telecommunication projects, metro and railway projects, metro projects control, overhead power network, 3rd rail and signaling in rail transportation.

Capabilities

• Design, supply, and implementation of metro and railway telecommunication network:
• Radio Trunk System, Central Clock, LAN, SDH, CCTV, PABX public telephone system, ETS, PIS, PA
• system, Power supply equipment
• Supply, design, and implementation of TETRA-DMR coverage
• Design and implementation of virtual fences
• Design and implementation of FAS systems
• Design and implementation of BMS systems
• Design and implementation of OCS network

Some Projects

• Design, purchase, and implementation of telecommunication equipment for the first line of Esfahan urban and suburban railway
• Design, purchase, and installation of radio coverage telecom equipment for IR of Iran railway tunnels 400 Km (Fiber Optic repeater)
• Design, purchase, installation, and commission of SDH 57 optic fiber equipment for the south station of IR of Iran railway
• Purchase and implementation of foundation and installation of overhead power network masts for Tehran-Mashhad railway
• Design and manufacture of fittings and equipment of overhead power network of Soufian Cement railway
• Design, manufacture, installation, and commission of radio equipment and links in petrochemical complexes and oil fields in various parts of the country
• Design and implementation of temporary radio coverage for Makran Petrochemical complex
• Supply and design of temporary radio coverage of Asalouyeh green tanks

Sanam Commercial Department

- Design and manufacture of traffic control systems
- Air conditioning systems, axial and centrifugal fans
- Smart and engineering control systems
- Supply and implementation of telecommunication and railway metro projects
- Radio systems

Mapra Engineering Co. is one of the subsidiaries of Sanam Industrial and Commercial Co., operating in the fields of design and manufacturing AFC systems, traffic control, air conditioning systems, and tunnel ventilation and parking fans, design and manufacture of BMS/BAS systems, design and manufacture of advanced electric motor drives. Enjoying high technical and engineering capacity and efficient hardware facilities, the company has fulfilled a variety of projects in metro and rail transportation. Execution of automated fare collection system and traffic control for Tehran, Tabriz, Shiraz, Esfahan metro, IranAir, providing Tehran metro signaling consultation, repair and maintenance of air conditioning system of Tehran metro lines 1, 2, 4, 5 and 7 are from among the current projects of the company.

B.2. Train Glass

Because of the importance of security for these vehicles the strength and optical parameters should be taken into account and the quality tests passed. The sight of the driver is so important that any freezing or fogging should be completely avoided. The electric power heats the electrically heated glass to prevent the windscreen surface from freezing. Sightless heating wires method is used for applying the electric power on windscreens. IGP quality assurance experts exercise close control at each stage of the manufacturing process, from raw material through final inspection, to ensure conformity to defined quality standards.

Windscreen Features

- Improved safety by giving clear vision during the cold and wet situation.
- Fast de-icing and de-misting.
- Design and manufacture complicated shapes.
- Sightless heating wires are run in a sinusoidal, zigzag, or linear pattern to avoid optical disturbance.

The prime function of bodyside windows in coaches is to provide passengers with a clear view of the coach's surroundings and to enhance sightseeing opportunities. In the event of an incident, however, the windows may need to provide secondary functions-first one of containment followed by a second one of escape. The bodyside windows are including an aluminum frame, rubbers, glass, hinge joints, and locks. Fixed or opening.

Body Side Windows Features

- Using fire-resistant rubber and seals.
- Mechanical and corrosion strength of frame through anodizing or painting.
- Complete control on visual and thermal characteristics of glass such as U-value, Tv, Tsol, Tuv.
- Fully tempered glass layers in insulating glazing.

Certificates

Staatliche Prüfstelle für Waffen und Sicherheitstechnil
Legal verification office for weapons and security engineering

Beschussamt München

Prüfbescheinigung — **B-140 10**
Test certificate

Durchschusshemmende Verglasung
Bullet resistant glazing

Antragsteller Proposer	IGP Iran Glass Products Kave Ave. / Isfahan Iran
Hersteller Producer	IGP
Ort und Datum der Prüfung Place and date of Test	München, 11.08.2010
Gültigkeitsdauer bis Period of validity	10.08.2020
Prüfanforderungen / Verfahren Test requirement and method	DIN EN 1063 BR6-NS Kaliber/Caliber: 7,62x51 Geschoss/Bullet: FJ/PB/SC Geschwindigkeit/Velocity: 830m/s +-10m/s Trefferdreieck/triangel: 120mm +- 10mm
Gegenstand der Zertifizierung Object of certification	VSG 500x500x42,6mm
Typenbezeichnung Product reference	IGP Bullet-proof glass level BR6
Prüfergebniss Test-result	Der Prüfgegenstand **erfüllt** die Anforderu The testsample **fulfills** the requirements
Details siehe Prüfbericht Nr. Details see report No.	B-140 10

Zertifikate ohne Unterschrift und Dienstsiegel haben keine Gültigkeit. Dieses Zertifikat darf nur vollständig und unve weiterverbreitet werden. Auszüge oder Änderungen bedürfen der Genehmigung des Beschussamtes München. De Prüfbericht ist Bestandteil des Zertifikats.

Certificates which are not stamped and signed by the Proof House are not valid. This certificate may be only copiec transmitted in its entirety and without modifications. The use of parts of this certificate or modifications are only allo the express consent of the Beschussamt München. The report is a component of the certificate.

München, 13.08.2010

Uschold

Beschussamt München , Franz-Schrank-Str. 9, D-80638 München

Mitglied der VP/

Tel.: +49 (0) 89 17901-339
Fax.: +49 (0) 89 17901-260
Email: poststelle@ba-m.bayern.de

Dedal Attestation & Certification

Notified body No. 1922
Bulgaria, 8230 Nesebar
Mladost #50

CERTIFICATE

of constancy of performance

1922 - CPR - 0071

In compliance with Regulation (EU) 305/2011 of the European Parliament and of the Council of 9 March 2011 (the Construction Products Regulation or CPR), this certificate applies to the construction product

Bullet Resistant Laminated Safety Glass - IGP: BR6002, class of bullet resistance: BR6-S

placed on the market under the name or trade mark of
IRAN Glass Products (IGP)
Isfahan-Tehran highway, Km-28 Shahinshahr, Iran

and produced in the manufacturing plant of
IRAN Glass Products (IGP)
Isfahan-Tehran highway, Km-28 Shahinshahr, Iran

This certificate attests that all provisions concerning the assessment and verification of constancy of performance described in Annex ZA of the standard

EN 14449:2005, EN 14449:2005/AC:2005

under system 1 for the performance set out in this certificate are applied and that the factory production control conducted by the manufacturer is assessed to ensure the constancy of performance of the construction product.

This certificate was first issued on 21.09.2011 as 1922-CPD-0071 and reissued as 1922-CPR-0071 on 30.04.2014 and will remain valid until 30.04.2020 as long as neither the harmonised standard, the construction product, the AVCP methods nor the manufacturing conditions in the plant are modified significantly, unless suspended or withdrawn by the notified product certification body. The certificate is supported through annual surveillance audit and is reissued after each surveillance audit. The validity of the certificate may be confirmed in the CE register at the web address www.dedal-bg.net

CE

Issued:
Burgas, 03 May 2019

Embossed stamp of "Dedal - A&C" Ltd.

Manager:

Dedal Attestation & Certification

arch. Galina Vasileva