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Dear Dr. Majid Bavili Tabrizi  
Shareholder and Chairman of the Directorate Board of  
(Forging, Stulz, Polad Gateh, Middle East Steel Industries  
Group)  
Holding Companies  
With sincere greetings arising from the heart of an Iranian  
committed and believed to the high human and Islamic  
goals, and as an artisan that like iron in the hands of a  
strong ironsmith is not surrendered in hardships of the  
life and has always taken important steps in line with  
development, we hope prosperity and pride for the people  
and the country and we wish happiness and health.  
The awesome efforts of the Iranian is and has always been  
well-known for everyone. Success can be achieved with  
continuous attempts and this way the country will be in the  
path of development and progress in any field. Although  
in the path of progress, there have always been barriers  
and the people who create barriers and cannot watch  
the welfare and development of the people, their plans  
will go up in smoke with the honor of the brave people of  
the country, and the goals are achieved despite all these  
limitations and deficiencies.  
We, the Iranian artisans will not let the foreigners to  
involve the industry of this country and depredate the  
wealth of our understanding and hard working people. By  
non-stop attempts, we will always preserve the name of  
Iran and being Islamic and will show to the world that the  
Iranian will always be independent.

Majid Bavili Tabrizi

## 1987

Iran Tarctor Forging company as the largest and most well-equipped forging company in the country and also the Middle East. Iran Tarctor Forging company is a separated and 4055 registered number with the registration office of Tabriz. After separation, the major shares belong to the tractor company and then transferred to the organization for the promotion and modernization of Industries organization of Iran.

## 2001

In accordance with the system of state-owned major stock of the company, was granted by the Organization for the Promotion and Modernization of Industries organization of Iran through the Stock Exchange and the Private Sector (Bavili Family).

## 2010

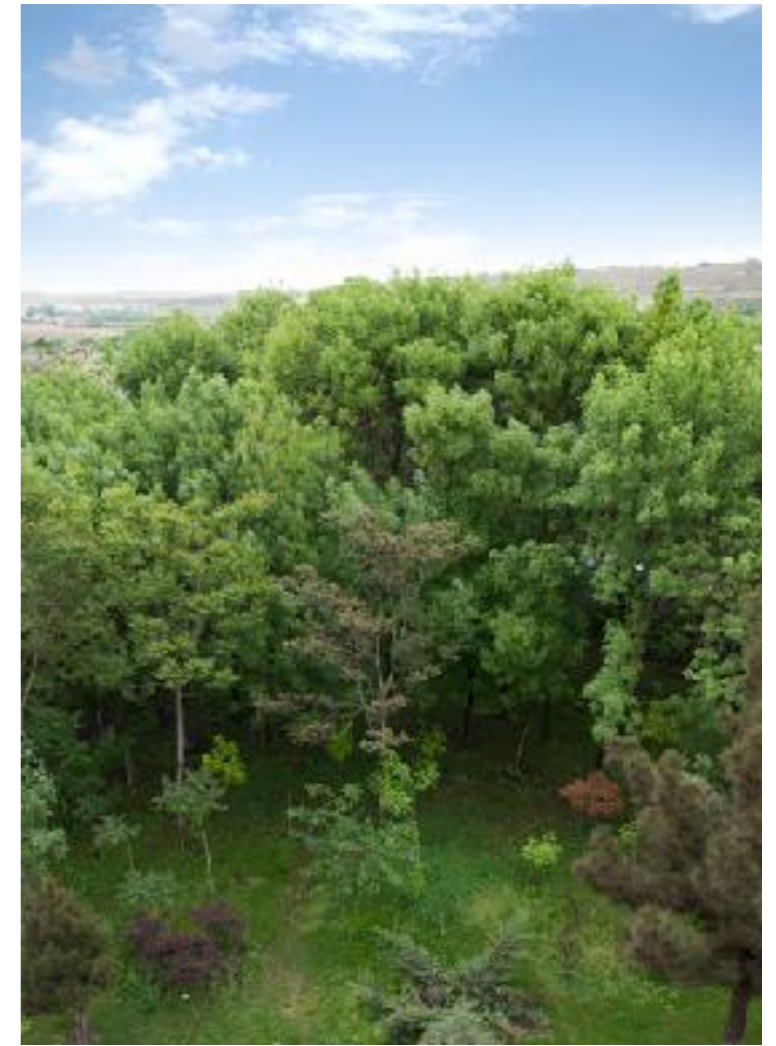
The shares of this company have been transferred to the current management. The forging company has an area of about 10 hectares and an indoor area of 100,000 square meters, with an annual production capacity of 25,000 tons, due to the variety of parts.

## NOW

Iran Tarctor Forging company Utilize the world advanced equipment, it has been able to provide various services in the fields of forging, mold making, heat treatment, quality and machining. The Iran Tarctor Forging company offers a range of important and safety components in various industries, including automotive, agriculture, oil and gas, railways and offshore, construction and mining, and general engineering. The company's exclusive ability to produce a variety of crankshafts, along with the production of parts weighing 200 g to 100 kg.







## WAREHOUSES OF I.T.FORGING

1. The roofed warehouse of mould and tools: that has an approximate flat area of 1800 m<sup>2</sup> and about 7200 m<sup>2</sup> floors area that is equipped with one 4 tons lift truck and 2 overhead cranes of 1 and 3.2 tons. In addition, the abovementioned warehouse is equipped with information management integrated system that the status of the moulds and tools existing in the company is accessible in online form for all relevant fields.
2. Raw materials warehouse: with the area about 7500 m<sup>2</sup> flat industrial shed and about 5000 m<sup>2</sup> open area under the crane. This warehouse is equipped with two 5 tons overhead cranes, one 7 tons crane and two 7 and 10 tons lift truck machines that make it possible to load and unload 700 tons of materials daily. It is worth mentioning that the open area of the warehouse is shelved and can store the raw materials in a classified way. This warehouse has an average capacity to store about 20000 tons of materials in a year.





## WAREHOUSES OF I.T.FORGING

3. Reserve warehouse and used tools: This warehouse has an approximate area of 1360 m<sup>2</sup> that is equipped with one electric lift truck machine and modern shelves that stores all goods in a classified and coded way and based on the standard conditions for storing the goods. This warehouse also as the other sections of the company is equipped with the integrated system of information management that requests for purchase, storage and delivery of the goods to the consumer in a planned way and offers the relevant report to all units of the company.



## **I.T. FORGING CUTTING UNIT**

The cutting unit performs the cutting of all raw materials and cuts the parts built based on the control program regularly and 24 hours a day. Cutting is done in two methods of saw and guillotine.

The cutting machines are as follows:

1. Wagner saw including 6 machines
2. Bandsaw including 3 machines
3. 750 tons guillotine machine
4. 500 tons guillotine machine

In addition, the tool sharpening unit, sharpens the cutting tool.

The cutting unit development program is being prepared and in order to increase its capacity, new machines have been predicted





## I.T. FORGING FORGING WORKSHOP

The production unit is equipped with 20 production lines from 200 tons to 8000 tons press and all lines include 1. Induction furnace, 2. Forming press, 3. Trimming press, and most of the lines have rolling machines, too.

This part of the factory is located in the main hall under a ceiling and includes the following lines:

1. 200 tons horizontal press line
2. 900 tons horizontal press line
3. 0.6 MN press line (2 lines)
4. 0.8 MN press line
5. 10MN press line (3 lines) along with automatic & manual rolling machine
6. 13 MN press line (2 lines)
7. 14.5 MN press line
8. 16 MN press line along with manual rolling machine
9. 20 MN press line along with manual rolling machine
10. 25 MN press line (4 lines) along with automatic & manual rolling machine

11. 40 MN press line along with automatic rolling machine (2 lines)

12. 80 MN press line along with automatic rolling machine

Capacities of the Production Unit:

1. Existence of production lines with full equipments and their variety and employing experienced and expert forces have made the products of the company incomparable from the viewpoint of volume and quality.
2. Producing more than 1400 kinds of different parts weighing between 200 gr to 100 kg including the parts of the agricultural machineries, oil and gas industries, railway and rail industries parts, textile industries, cement industry, electricity equipments, automobile industries parts such as front suspension and motor and also aviation industries.
3. In automobile industries different kinds of front suspension parts that are of great importance are produced regularly and sent to the customer after different controls such as overlap, crack and weight.

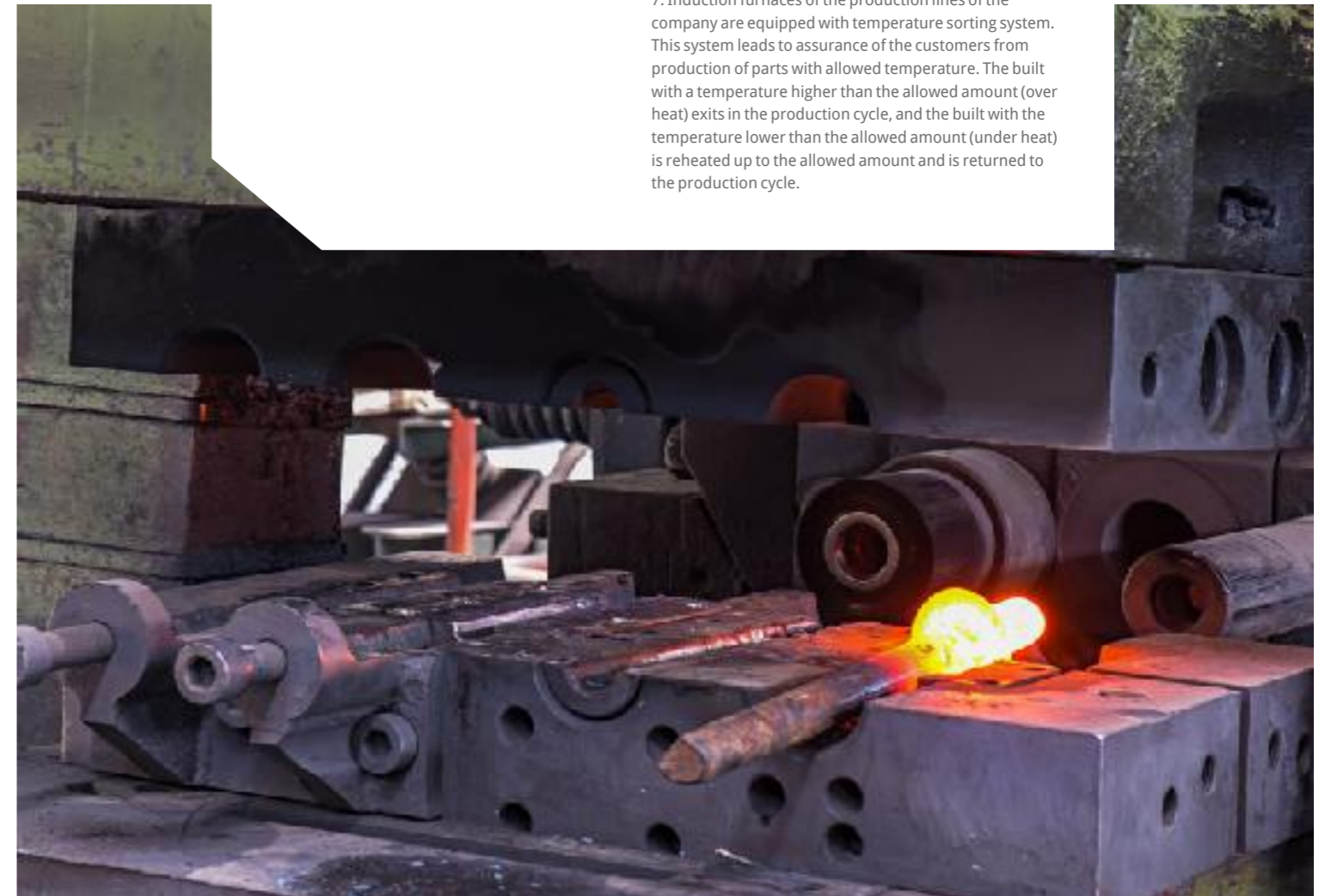






## I.T. FORGING FORGING WORKSHOP

4. The capacity of 8000 tons press and production of 3, 4, and 6 cylinder crankshafts has made this company unrivaled in the region.
5. Producing shattons of gasoline and petrol motors is in a way that includes the weight precision of  $\pm 12$  gm.
6. Different machines of rolling the parts manually and automatically allow the uniform production and operator error decrease, and reduce the waste.
7. Induction furnaces of the production lines of the company are equipped with temperature sorting system. This system leads to assurance of the customers from production of parts with allowed temperature. The built with a temperature higher than the allowed amount (over heat) exits in the production cycle, and the built with the temperature lower than the allowed amount (under heat) is reheated up to the allowed amount and is returned to the production cycle.



## I.T. FORGING HEAT TREATING UNIT

This unit includes 2 sections:

1. Continuous thermal operation furnaces
2. Hardening and return furnaces

1. Continuous Thermal Operation Furnaces:

Continuous Thermal Operation Furnace No. 1

This line regularly performs thermal operation of the produced parts with anneal cycle (isothermal anneal) in order to reach the homogenous ferrite and perlite structure generally in the cemented parts in gear wheel parts of the gearbox of different vehicles, tractor and other machineries. The important points of thermal operation cycle such as temperature and the storage time of the parts are determined and inserted in the control program. This furnace can perform anneal and normalized thermal operation on the parts. The control unit does sampling from all operated parts equal to AQL and at required number and sends the samples to the laboratory.

## I.T. FORGING HEAT TREATING UNIT

This line is equipped with monitoring system and records the storage time of the parts in each zone along with their temperature in different hours. This monitoring also includes the stage after fast cooling that is called the return operation (the last zone). Line monitoring by registering the record of thermal operation assures each controller from the accuracy of the procedure. Continuous Thermal Operation Furnace No. 2 This line has also been installed by an Iranian company and by removing the defects has been placed in the production line with its all capacity.



## I.T. FORGING HEAT TREATING UNIT

This furnace has been designed and constructed similar to line 1 for the parts with isothermal anneal cycle and its cooling unit completely controls its cooling time using the cool air. This line has a monitoring system that registers and keeps the operation records. These furnaces are continuous contrary to batching furnaces that the parts enter the furnace from one side and exit from the other side.

### 2. Batching Thermal Operation Furnace (Hardening and Return)

Besides these two continuous thermal operation lines, several batching furnaces do hardening and tempering operations along with tempering furnaces. The hardening and batching return furnaces lines include 3 hardening furnaces, 3 return furnaces and one cooling tank. In these furnaces the hardening, return, normalization and anneal operations can be done on the parts. The charging capacity of the operations inside the furnaces is up to 1200 kg in each charging.



## I.T. FORGING SHOT BLASTING & COINING UNIT

### Shot Blast Workshop:

Includes 6 shot blast machines 2 of which are to shot the parts in a hanger way and 4 are in the form of rotary conveyor. The capacity of the shot blast workshop is more than 2000 tons per month that has the capacity to shot the parts weighing between 200 g to 100 kg.

### Shot Blast Machines

1. 26GN I shot 2. 26GN II shot 3. WST-28-200 big shot 4. 15GN small shot 5. Big hanger shot 6. Small hanger shot

### 4. Coining Workshop:

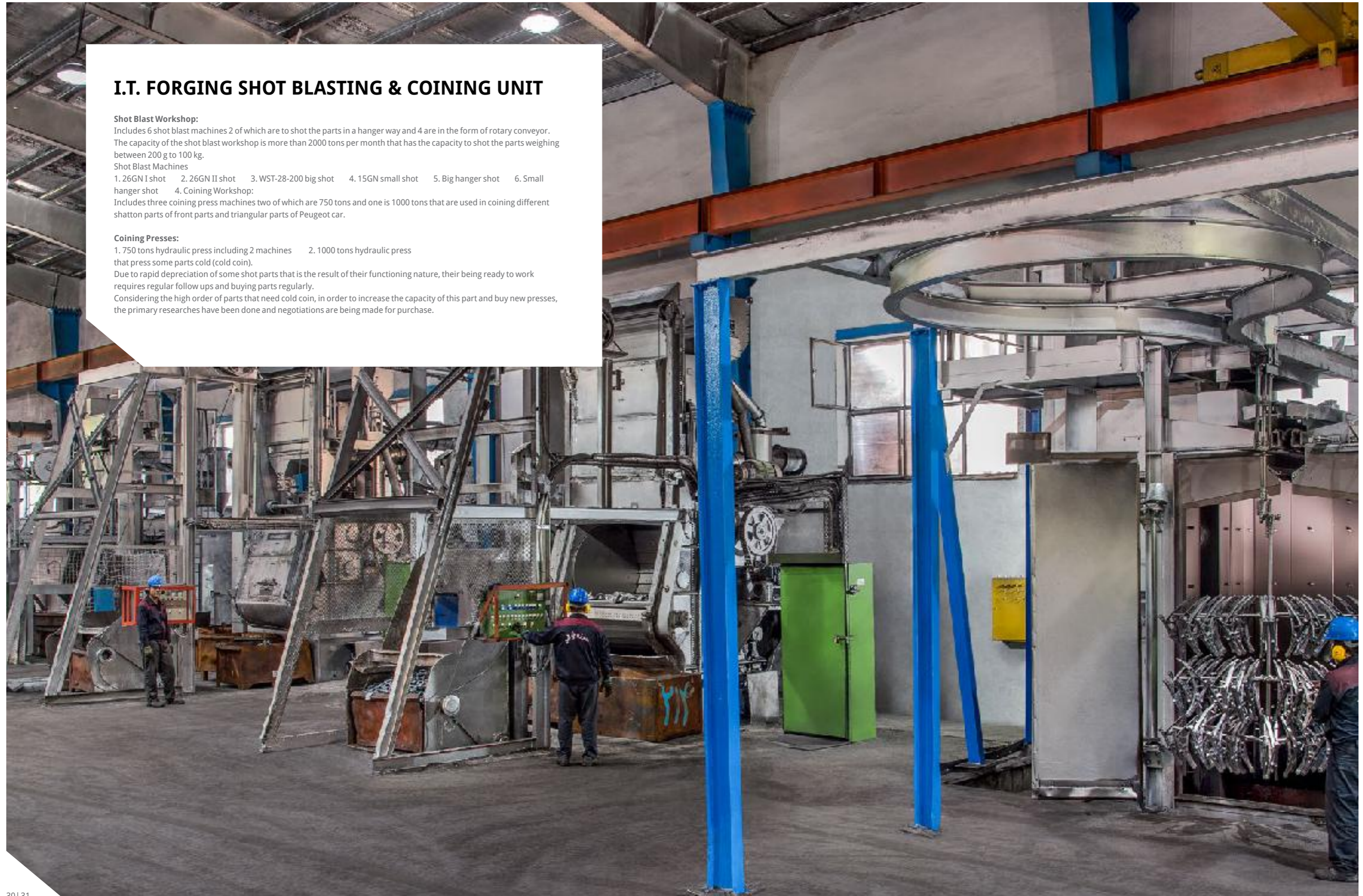
Includes three coining press machines two of which are 750 tons and one is 1000 tons that are used in coining different shatton parts of front parts and triangular parts of Peugeot car.

### Coining Presses:

1. 750 tons hydraulic press including 2 machines 2. 1000 tons hydraulic press that press some parts cold (cold coin).

Due to rapid depreciation of some shot parts that is the result of their functioning nature, their being ready to work requires regular follow ups and buying parts regularly.

Considering the high order of parts that need cold coin, in order to increase the capacity of this part and buy new presses, the primary researches have been done and negotiations are being made for purchase.







## I.T. FORGING QUALITY ENGINEERING

### Quality Unit

The quality unit is responsible for controlling the items, imported materials, and produced products. In order to certify and provide the opportunity to use the steel imported to the company, in the first stage, dimensional control, chemical analysis, hardness and impurity investigation are done on these raw materials.

Introducing Different Sections of the Quality Unit:

### Laboratory:

By having updated and advanced equipments, the laboratory of the forging company is able to perform tests such as quantometry, metallography, tension, impact, hardness measuring, microhardness, and fiber test.

**Quantometry Machine:** This machine is made by ARL company of Switzerland that has the ability to analyze 24 elements with the precision of 0.001%.

**Tension Machine:** This machine is made by Schenck Trebel company of Germany and is used for performing the tension and pressure tests on the samples with a maximum capacity of 400 kN.

**Impact Machine:** The mentioned machine is made by

Wolpert company of Germany and is used for impact test performing with the maximum absorbed energy of 300J. **Hardness Measuring Machine:** These equipments have the capability to measure the hardness of the materials and parts in Rockwell, Brinell and Vickers ranges that are used based on the hardness range.

**Micro Hardness Machine:** The mentioned machine is made by FUTURE-TCH factory in Japan and is used for measuring the hardness of metallography phases and also determining the amount of penetration depth of hardened surfaces using the methods such as nitriding, carburizing, etc.

**Metallography Microscopes:** These machines are used to determine the percentage and type of metallography phases of the parts and finally after comparing with the requested standards by the customer, the status of the parts is determined.

**The Workshop of Preparing Metallography Samples:** In order to the mentioned samples, different types of polishers with the mesh sizes of 180 to 1200 and aluminum oxide are used. The H Gram test is also used to observe the fibers of the parts in the mentioned workshop.



## I.T. FORGING QUALITY ENGINEERING

### Middle Control Unit:

This unit is responsible for controlling the produced parts in pressing workshop. All produced parts in different presses are measured based on the plan certified by the customer so that in case of observing any contradiction, the corrective measures appropriate with the appeared defect are taken.

The data extracted from this unit are registered permanently in SPC software in order to measure the status of parts production and statistical investigation. This section is also equipped with crack detection machine, digital scale and different measurement tools that based on the data received from the customer (plan - control design and other documents) the produced products are verified in the beginning of production and the parts are also controlled with defined periods upon production to prevent production of unmatched parts.







## I.T. FORGING QUALITY ENGINEERING

### Final Control Workshop:

In this workshop all produced parts are controlled based on the control plan related to each part. This workshop is equipped with different crack detection machines (MP), Eddy current, high precision scales and slipping conveyors.

### Crack Detection Machines

The final control workshop is equipped with different crack detectors such as universal crack detectors, crank line crack detector, beam axle crack detector, and crack detector special for shatton line. Operators detect the cracks with Magnetic Particle method and under ultra violet light and separate the sound and cracked parts from each other. Using these equipments, safety parts such as Peugeot 206 and 405 triangular parts, suspension parts of the crankshafts and shattons are investigated from the viewpoint of crack existence.

### Eddy Current Machines

This machine in the non-destructive method has the ability to separate the parts and substances with different materials and hardness in a way that in case of materials mixing or unmatched parts from the viewpoint of structure and hardness, this machine has the ability for separation and sorting.





## I.T. FORGING DESIGNING AND ENGINEERING UNIT

### Designing and Engineering

The designing and engineering unit as one of the most important sections of the forging company attempts to realize the policies of the company in increasing the quality of the parts and satisfying the customers by employing experienced engineers and using new designing software and methods. Producing parts with high precision based on the request of the customer in the least possible time and saving the raw materials by observing the quality of the part is one of the most important policies of the company in designing and engineering unit. For this purpose, in this unit, designing the moulds with high precision in done in CAD software and the model prepared from the primary design of the mould is used for simulating the forge process. Simulating process in this company is done by special softwares.

These software provide the opportunity to simulate the most complicated forge parts using the finite element and finite volume method with high precision. Using the simulating process, the forces required for parts production, the loads on the mould, probable defects of the part and materials flow are determined in two and three-dimensional method and designing the moulds and raw materials for removing the probable defects and production process optimization are continuously corrected.





## I.T. FORGING MACHINING UNIT

### Mould Making Unit

All moulds required for production line are made in the company and in order to achieve high efficiency and decrease re-working, all new or repaired moulds are examined precisely with CMM machine to be sure of the accuracy of the produced part. Benefiting from the advanced equipments in mould making unit, extensive services such as making different kinds of moulds, machining the big and complicated parts, thermal operations in vacuum furnaces and dimensions control with CMM machine are offered to the industry unit.

The Main Facilities and Capacities of the Mould Making Unit: The ability to offer technical engineering services in the field of different moulds such as software modeling, graphic and copper spark model making, simulating the forge process and mould making consultation

Machining different moulds with 3000\*2000\*1000 dimensions and multi-axis milling with CNC HIGH SPEED, and DNC mould, turning, spark and wire cut: High speed CNC milling machines model 2016 and 2017 (eight machines)

AGIE spark machines made in Switzerland

CNC milling machines including: Three-axis CNC milling machines – MAHO (Made in Germany) Four-axis CNC milling machines – BOKO (Made in Germany) Five-axis CNC milling machines – INGERSOLL BOHLE (Made in Germany)

Copy milling machines General milling machines Universal lathe and milling machines AGIE-CNC wire cutting machines (Made in Switzerland) Four-axis CNC milling machines – SHW (Made in Germany) – 900\*2500\*8000 mm CNC – GEORGE FISCHER & GILDEMEISTER lathe machines Universal lathe machines Flat and round grinding machines Sharpening and cutting tools manufacturing universal machines Repairing and rebuilding different kinds of moulds and spare parts of the machineries Automatic MIG welding line KESPAR & LINKOLN flux cored welding machines – (FCAW)

Hardening and nitrocarburizing thermal operation in Degussa vacuum furnaces with carbon cooling and gas nitriding special for moulds and tools

Polishing different moulds

A part of the records of the services offered to the customers:

1. Making different full die cast and low pressure moulds for TU5, TU3, EF7, and XU7 motors such as cylinder head, clutch shell, cylinder block, ladder frame, valve work, and bearing cap for SAPCO Company



## I.T. FORGING MACHINING UNIT

2. Making different die cast moulds during the recent years for IRAN KHODRO Aluminum Casting Company, including body moulds to water container cylinder, clutch shell, differential shell and odometer shell
3. Making a series of moulds including pole shoes and die cast moulds for Motogen Company
4. Making the moulds for forming and cutting aluminum sheets for Isfahan Optics Industries
5. Making different hot forming moulds for electric insulators used by Iran Transfo Company for the first time in Iran





## I.T. FORGING MACHINING UNIT

### CMM Machine

This machine is made by DEA company that with the precision of 8 micron and with the work desk with the dimensions of 3m\*1m\*1m has the ability to control moulds and instrumentation.

The mould making of the forging company not only makes moulds, tools and spare parts of the presses, but also makes different die cast moulds of Iran Khodro Company. Controlling all mentioned moulds is performed with the highest precision by experiences personnel using CMM machine. The 3D files enter the machine through computer and the machine can compare the sizes of the part with the sizes of the entered nominal part and reports them on the plan.





## I.T. FORGING HEAT TREATING UNIT

### Degussa Unit:

Considering the significance of the thermal operation of the made moulds and with regard to existence of unique thermal operation workshop in this company, we would like to offer a brief description about it as follows:  
One of the main needs of the mould making industries is the opportunity for hardening thermal operation and nitrocarburizing in vacuum furnaces that Iran Tractor Forging Company has taken a significant step towards self-sufficiency in making different forge, die cast and low pressure moulds by buying four thermal operation furnaces from Degussa Company of Germany and their installation and start-up, that the advanced technology with vacuum thermal operation furnaces is used in this workshop to optimize the life of forge and die cast moulds and steel tools. These furnaces can endure the pressure of 10-2 Microbar. Two of the four abovementioned furnaces are for hardening and two for return. The capacity of two small furnaces is 600 kg in each charging and that of the two big furnaces is 2500 kg in each charging.

## I.T. FORGING TRADING UNIT

### Main Duties of Procurement Section:

1. Includes preparing and supplying steel raw materials such as 27cd4 and 30msv6 to be used in production lines of the company and converting them to semi-final parts
2. Preparing and supplying the spare parts required for the companies' machineries repair, including the production lines machineries such as press machines and the machineries existing in complementary operation workshops such as thermal operation furnaces and shot blasts of complementary operations, hydraulic presses existing in final control workshops, the machineries for crack detection of the produced parts, and preparing and supplying the necessary parts for the machineries in mould making workshop
3. Preparing and supplying the used and protective tools for the workshop employees such as working gloves, safety shoes, etc. and also preparing the used materials of other parts such as constructional and industrial paints, the ironware used in the projects being constructed, and the blades used in the machineries of cutting workshop
4. Preparing and supplying the tools used in machineries in the mould making and spare parts making workshops



## I.T. FORGING COMMERCIAL UNIT

The marketing and sales affairs unit of the forging company is one of the subsets of the commercial unit that is formed of two sections of sales and marketing that during its activity from the establishment of the company has had sales to more than 150 domestic and foreign companies. The products warehouse of the company is also one of the subsets of marketing and sales affairs unit. The main activities of the marketing and sales affairs unit **are as follows:**

4. Receiving, numbering, packing, loading and sending averagely 60 tons of daily produced parts
5. Coordinating with the contractor porters for on-time sending of trailer or truck for loading
6. Having continuous relationship with active customers
7. Receiving required MRPs to meet the company's production program
8. Inserting and declaring the received MRPs in the company's system
9. Making coordination with other affairs units for on-time receiving of the needed parts
10. Making coordination and on-time sending of parts
11. Registering the information of sending the parts of the sites of the contractor companies and receiving electronic receipt
12. Issuing invoices for the sent parts and removing the contradictions with the customers in order to update the accounts in-between
13. Making coordination and having relationship with the foreign customers such as receiving orders, offering proforma, and producing and sending parts
14. Creating new markets and offering the abilities of the company to customers to receive new orders
15. Making preparation and arrangements to publish advertisement brochures and catalogues
16. Participating in important national exhibitions for optimized introduction of the companies capacities
17. Having relationship with the customers that are removed from the active customers list for any reason
18. Following up and receiving the demands of the company from the customers
19. Taking necessary measures for holding auction to sell the company's wastes





**I.T. FORGING  
PRODUCT SAMPLE**

Spindle Knuckle RH  
TF1242



Spindle Knuckle RH  
TF1299



Steering Arm  
TF0661



Spindle Knuckle RH  
TF0885



Housing  
TF0634



Fork Shifter  
TF1222

Socket Iec  
120- 20  
TF0768



Track Rod Arm  
TF1113





Hook  
TF504



Diff. Spider  
TF1058



Cap  
TF0267



Lenkhebel Links  
TF0636



Crank Shaft  
TF0413



Fork-Shift Rev. b  
TF0624

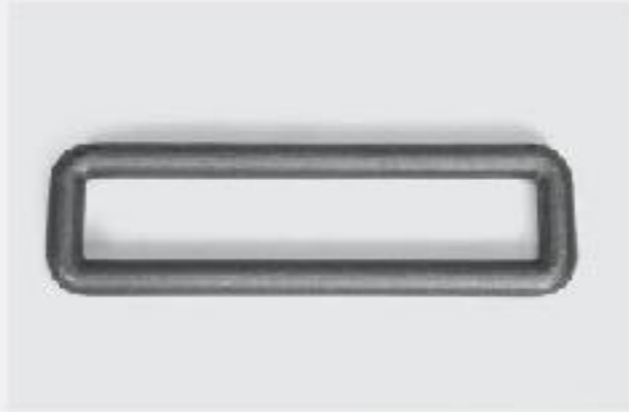
Conecting Rod Tu5  
TF1248



Triangle RH  
TF0929



Rod Center  
TF0956



Steering Lever  
TF0938

Steering Lever  
TF1092



Rectangle  
TF0418



Con.Rod (457)  
TF1090



Arm- Hdy. Lift  
TF0053



Cam Shaft  
TF0265

Achslenker, von  
TF0770



Biyel Kolu  
TF0997





## I.T. FORGING DEVELOPMENT PLAN

COLLABORATING WITH



By virtue of the agreements with senior directors of Iran Khodro and Sapco Companies and in order to reach to full self-sufficiency in design and manufacturing of types of molds required for Iran Khodro Company, this company has invested in the mentioned field as follows:

Training and transferring the design technology of types of the required and new molds through joining Tecno Mold and Bram Bila Companies of Italy and Heck & Becker Company of Germany

The required arrangements have been made for establishing, communicating, training and transferring the technologies.

Construction of a new metal production hall with the area of 1800m<sup>2</sup> adjacent to the present location. The operations related to construction and installation of all machinery and equipment were completed. It should be mentioned that the abovementioned metal production hall was constructed with cooperation and confirmation of Heck & Becker Company and established only for manufacturing of gravity and die cast molds.

Purchase of 27 CNC High Speed Milling Machine as follows. The relevant installation operations were completed:

a new High Speed CNC, DMG milling machine – Model 2016, for manufacturing of types of cylinder head

13 new High Speed CNC Milling Machines, Chevalier Model 2017 and 2016 - 1m for manufacturing types of cylinder head

6 new High Speed CNC Milling Machines, Chevalier Model 2017 with Table size 2016-1.6m Table load (6 tons) for manufacturing types of Core and Cavity of types of cylinder blocks

3 new High Speed CNC Milling Machines, Chevalier Model 2017 and 2016 – 0.80cm for manufacturing types of cylinder head

2 new High Speed CNC Milling Machines, Chevalier Model 2017 and 2016 – 1.2m for manufacturing types of Core and Cavity

a new High Speed CNC double column vertical machining center, Chevalier Vertical Model with table size (6\*2\*1m) table load(25 tons) for manufacturing types of frames of model 2017

a new High Speed CNC Horizontal Boring & Milling Machines, Chevalier horizontal 5-axis Model along with table load (11 tons) for manufacturing types of clutch shell of model 2017

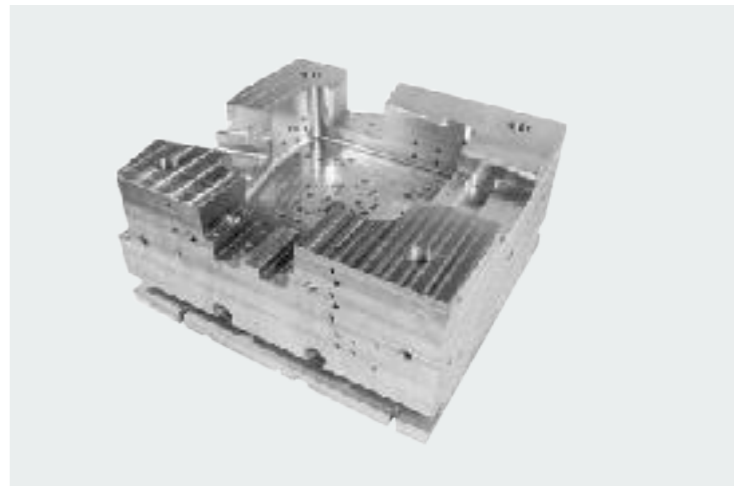
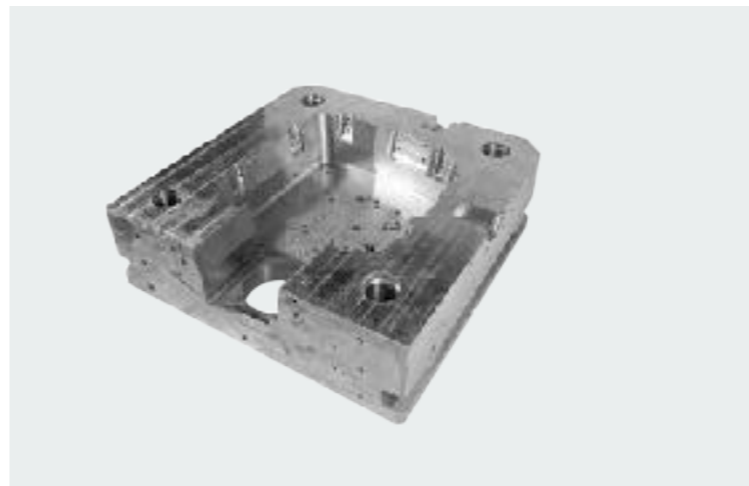
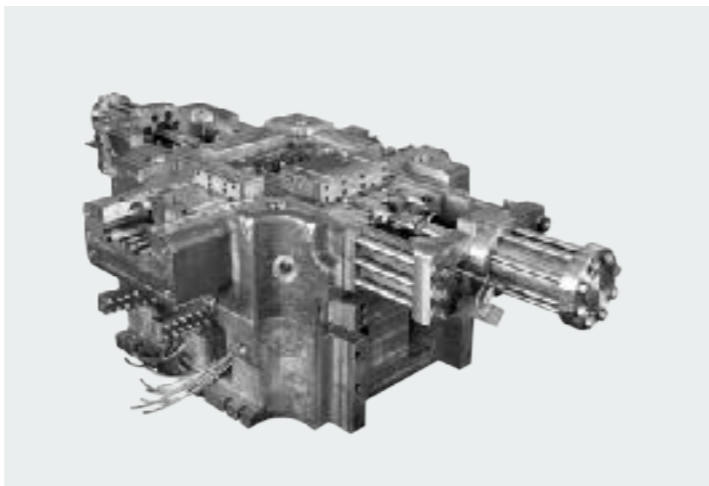
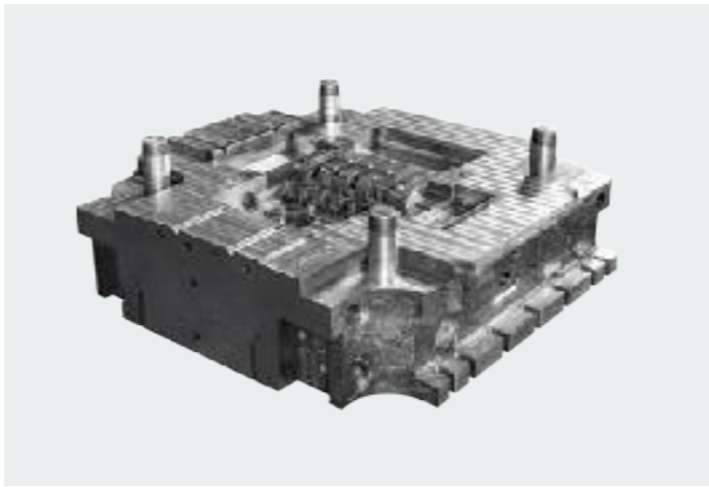
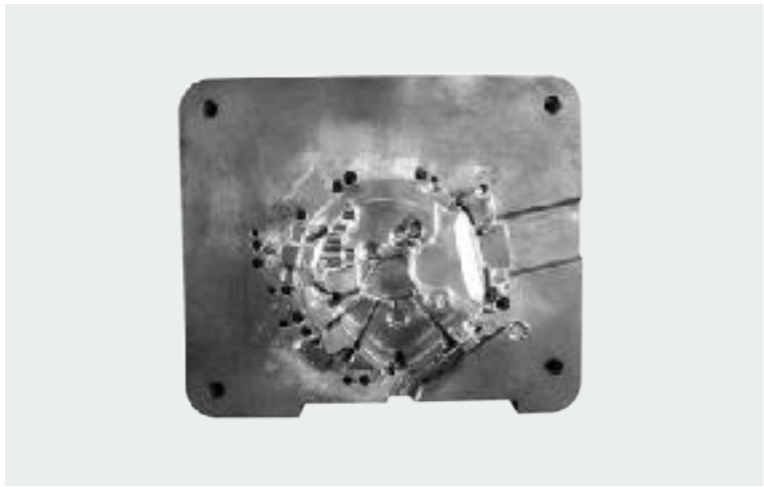
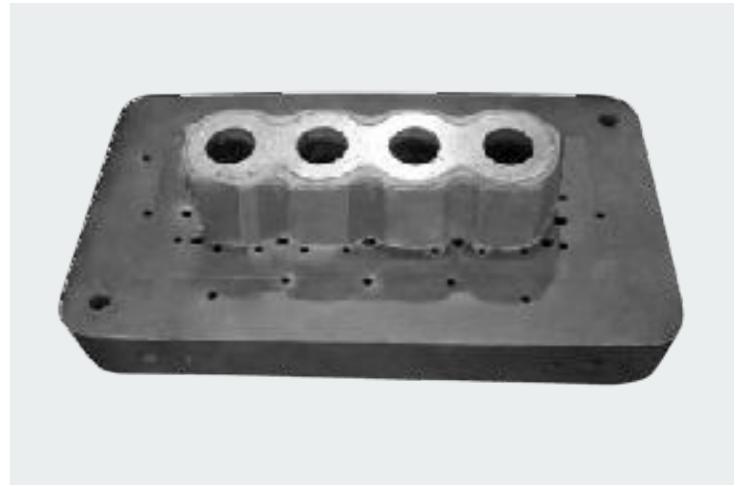
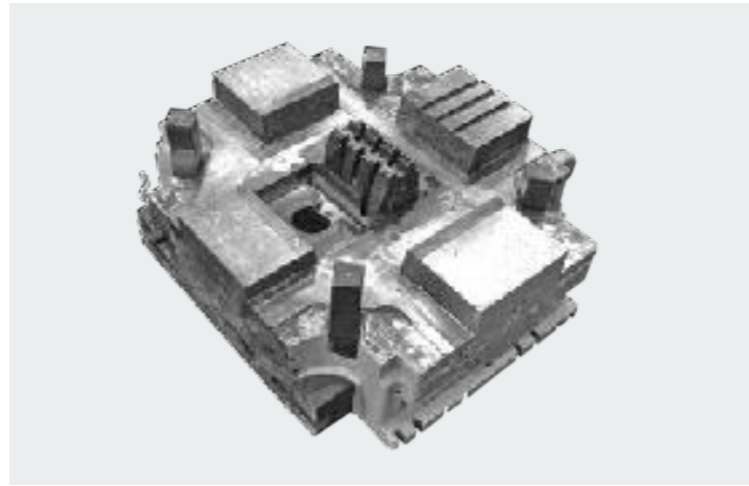
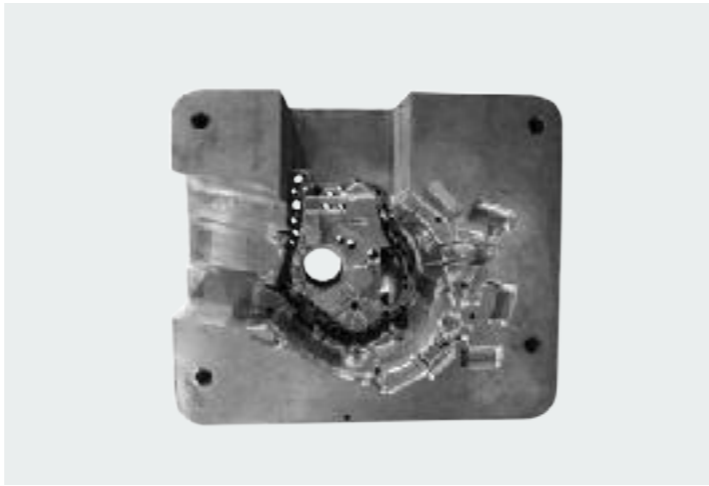
4. Employing 100 employees among the top students of the reputable universities for working in CNC workshop and training and transferring technology for design and manufacturing of types of molds

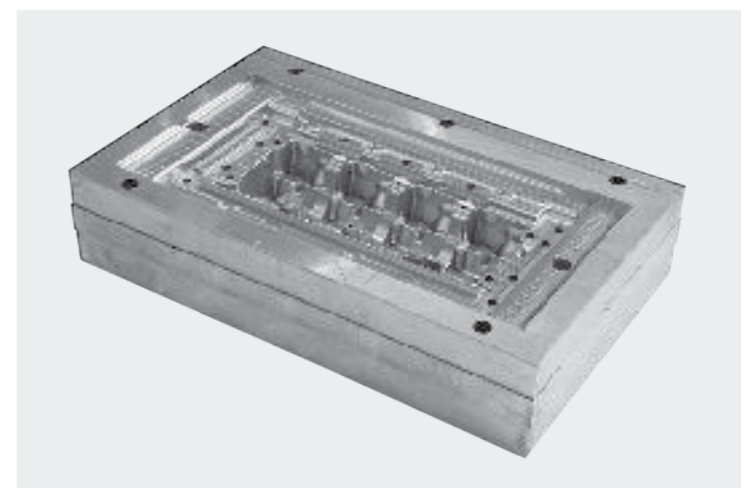
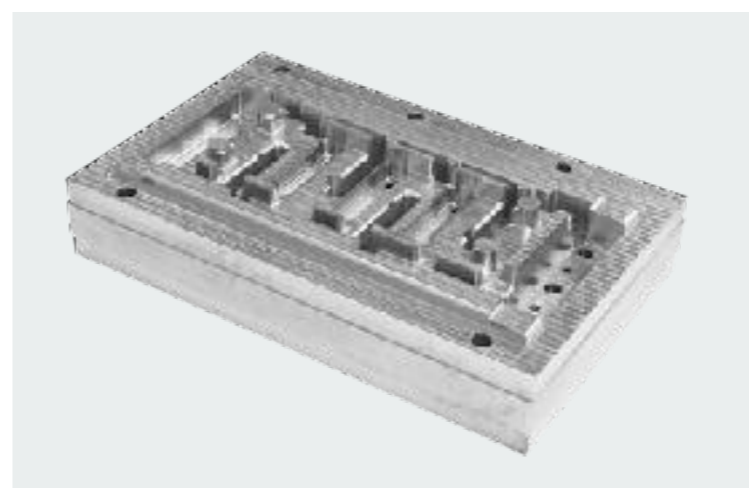
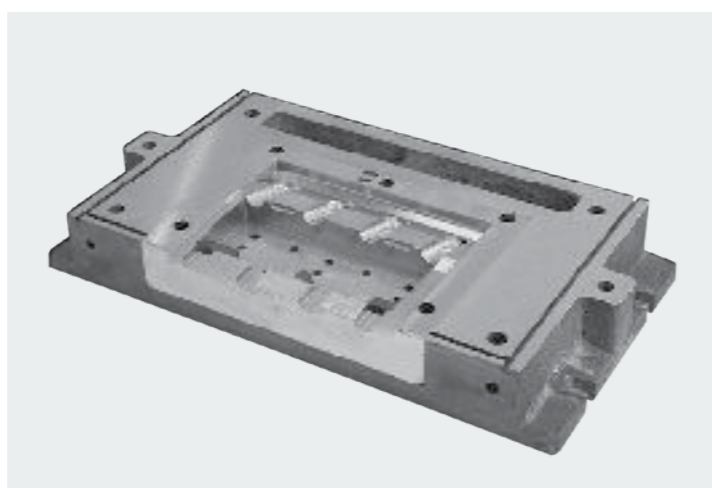
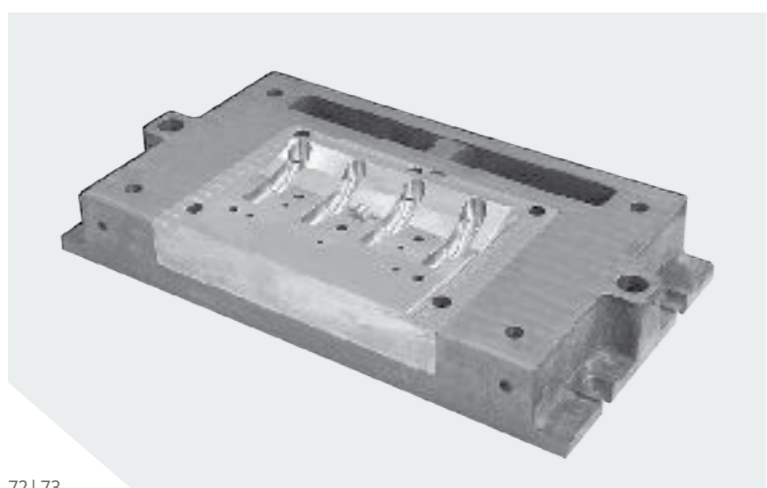
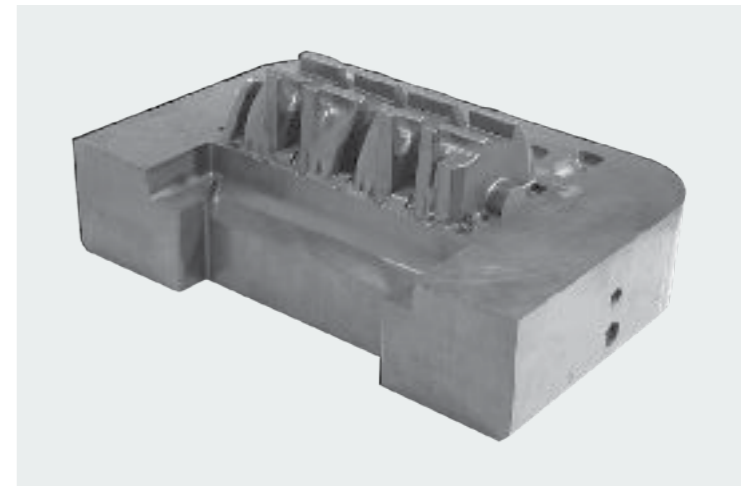
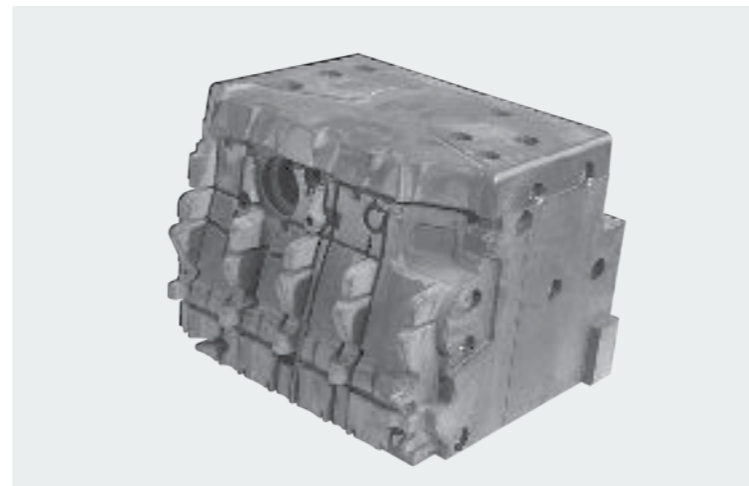
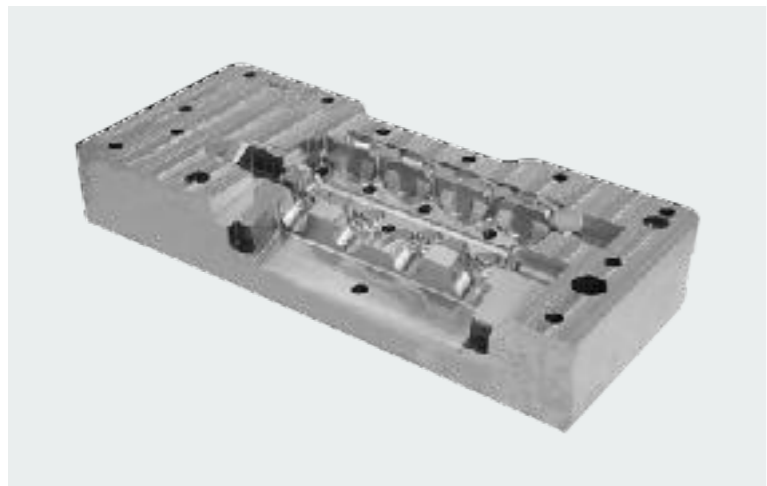
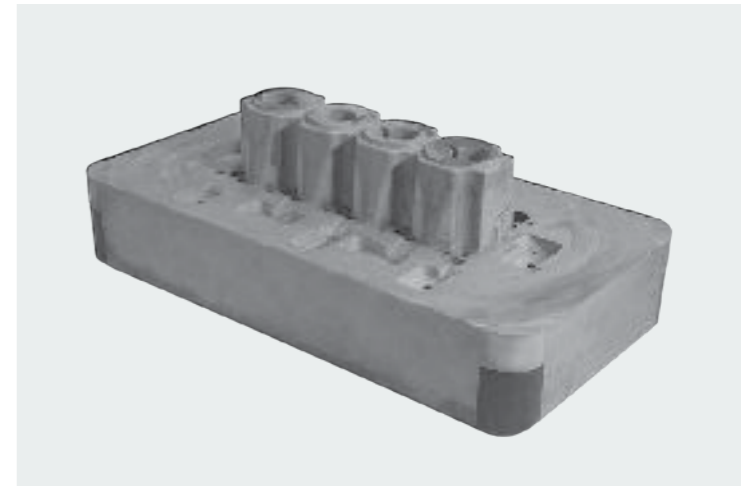
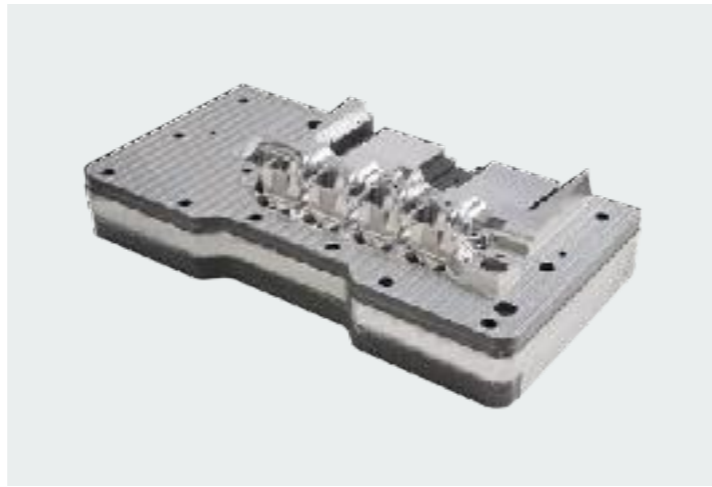
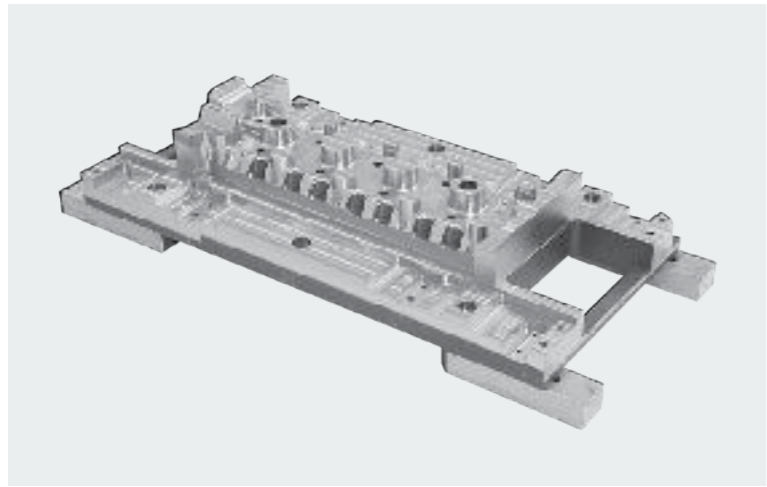
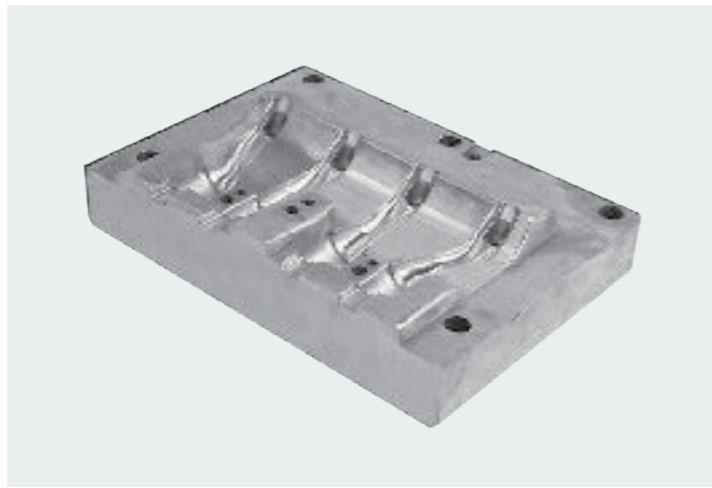
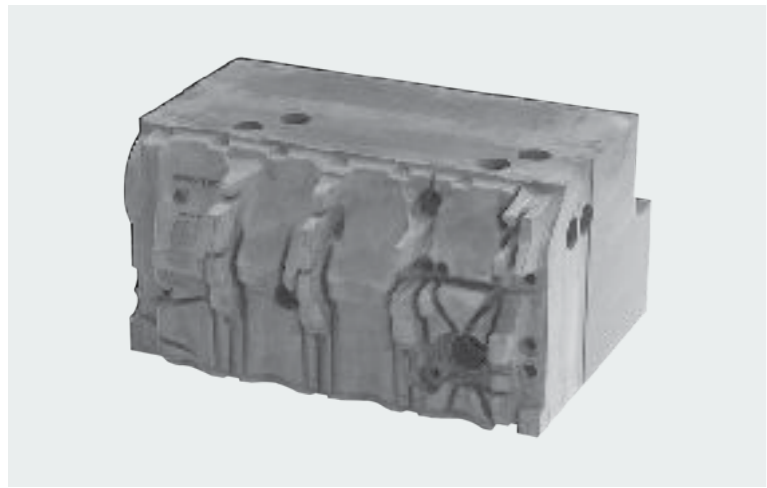
The sample images of abovementioned activities are presented for your notification.

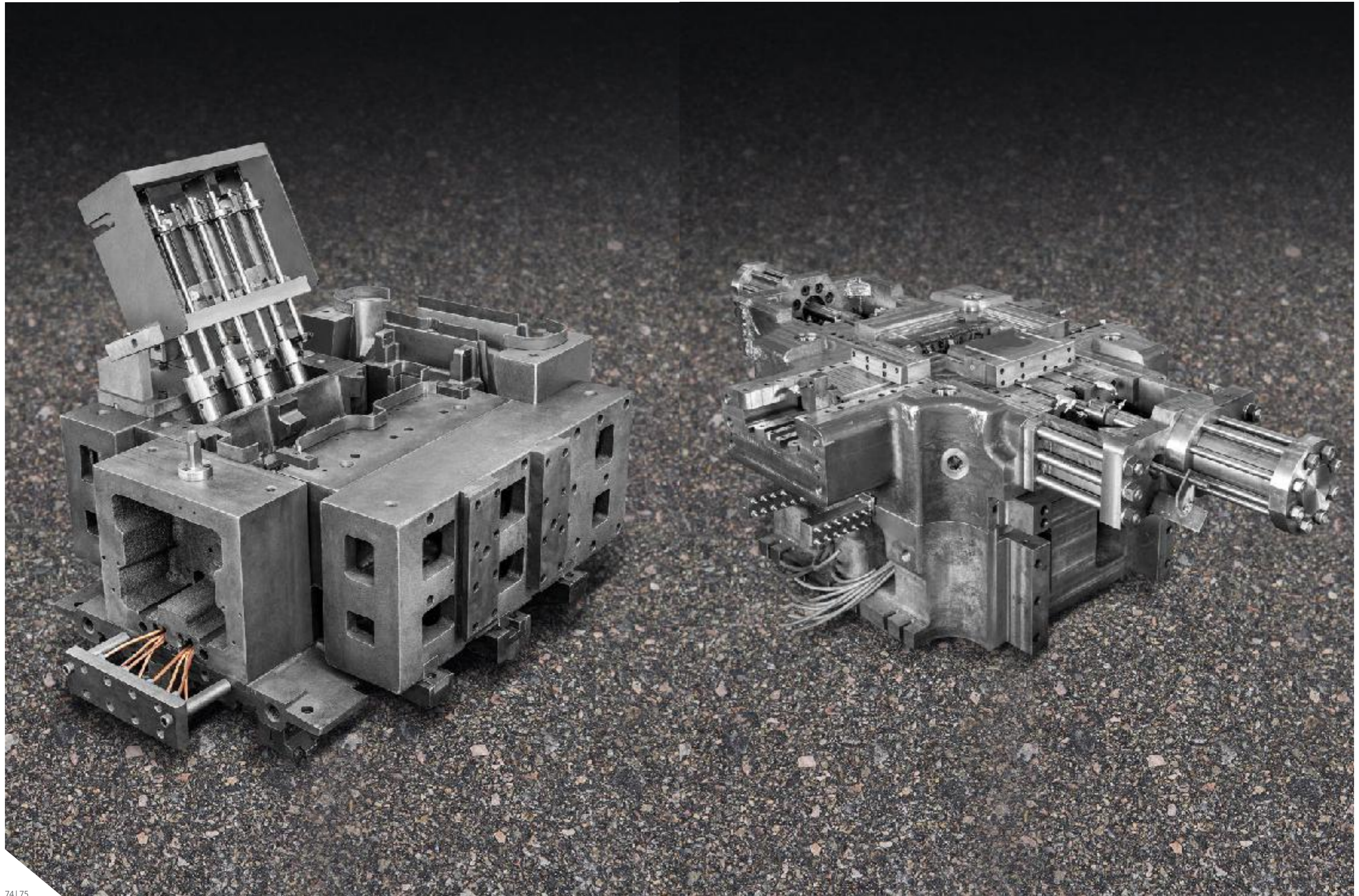




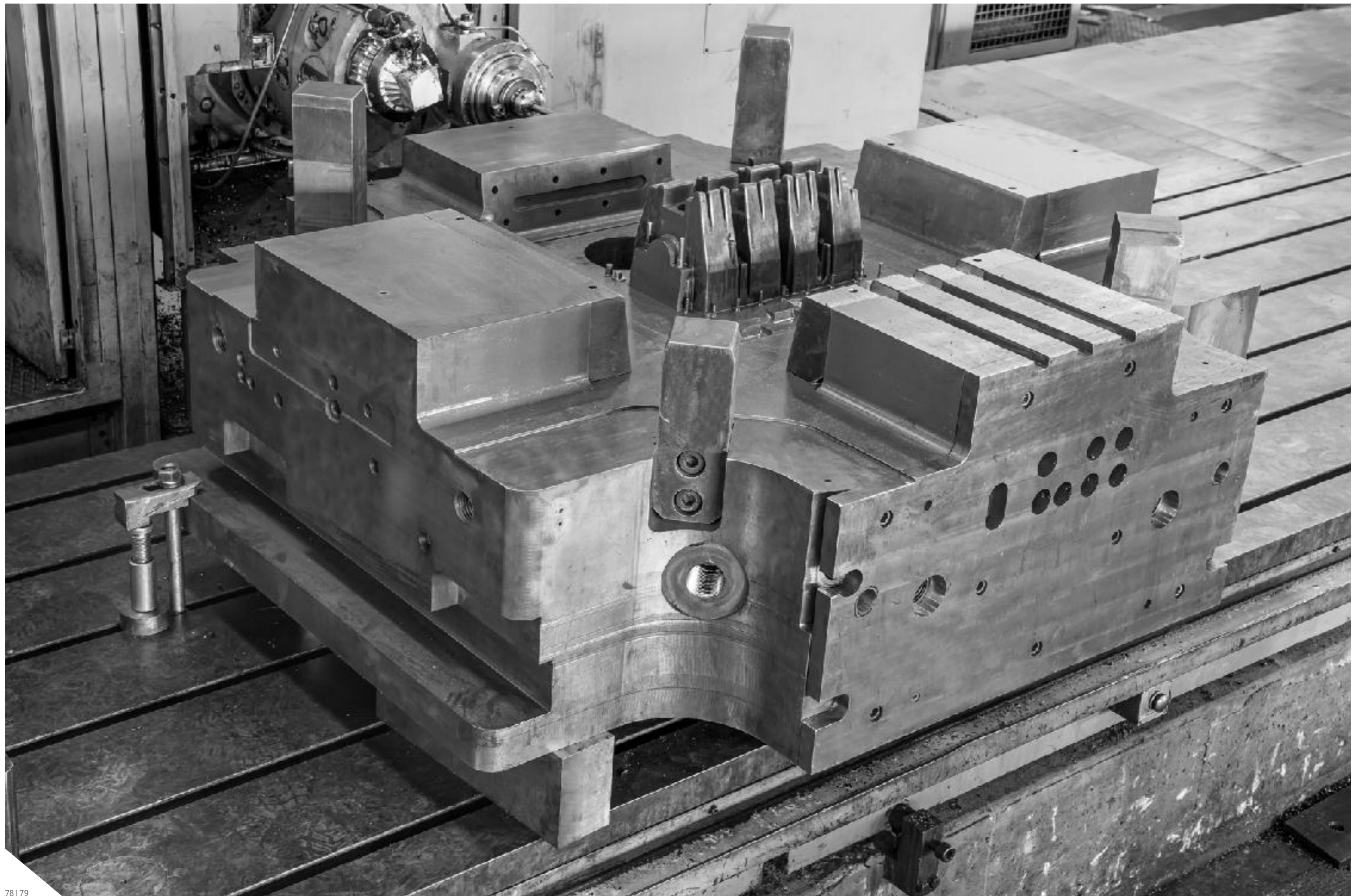














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