Dövmak Metal Automotive Spare Part Machine Ind. Co. Ltd.

We are working hard to establish our own standart that will meet and exceed our customer’s requirements

About us

Dovmak was established in 2007 by M.Sc. Mech Eng.Erdinc Uyar after 15 years experience in different segments of the metal production.

Our open area is 10000 m2, 4500 of which is closed. Our production plant is in Turgutlu that is located 40 km east of Izmir

We are holding ;

ISO 9001:2015 certificate to maintain the production,

BS OHSAS 18001 certificate to maintain the occupational health and safety management,

DIN EN ISO 14001 : 2015 certificate to maintain the environment.

We are capable of hot forging the metals like ;

Mild steel, low alloyed steel, high alloyed steel, stainless steel

Aluminium , brass

About us

We have 81 employees working in different departments :

Research and Development	: 2 engineers
Manufacturing Engineering	: 1 engineer + 1 technician
Quality	: 1 engineer + 2 technicians
Maintenance	: 3 mechanical, 1 electrical technicians
Production	: 3 supervisors, 3 assistant to supervisor, 40 workers
Tooling	: 13 technicians
Finance	: 3 office people
Facilities	: 8 workers

Our values

Keeping our environment clean

Using chemicals that are friendly with the users and the environment

Provide periodical training to our staff to keep the quality of the work

Provide periodical training to our staff to keep occupational health&safety

Protecting and supporting our customers on win-win basis

Keeping the understanding and the system of the company by applying continous improvements, error proofing methods and lean manufacturing.

Our vision

To be one of the leading companies in its sector by ;

-- making continous improvement in the process,

-- making R&D projects

-- serving to our customers well against their technical requirements

-- understanding our customers well in terms of their quality, price and delivery inquiries

-- considering how hard the forging process is ; trying to facilitate the work that is being carried out by the workers and thus become a favourite company to work as an employee.

In this respect, we always make *optimisation in the production of the parts

Our mission

Giving the best service (price - quality - delivery) to our customers

Improving our machine park by new machinery in certain periods

Applying TPM tools to reach up to the best uptime values for the machines in the production.

Keeping our budget strong against external shocks by strictly following our finance mentality

Following up the training level of our staff to keep the flawless run of all the processes

Seeking for suppliers with the required quality of service to maintain the flawless run of the production

Sectors we are serving to :

Dovmak has the capability of inhouse machining of some parts while we outsource some others to our machining partners.

We outsource the heat treatment and the coating processes completely.

We are serving to the following sectors by supplying forged and forged&machined parts

- Automotive
- Agricultural Machinery
- Gear Industry
- Clutch Industry
- Machine & Steel Industry
- Hand tools Industry

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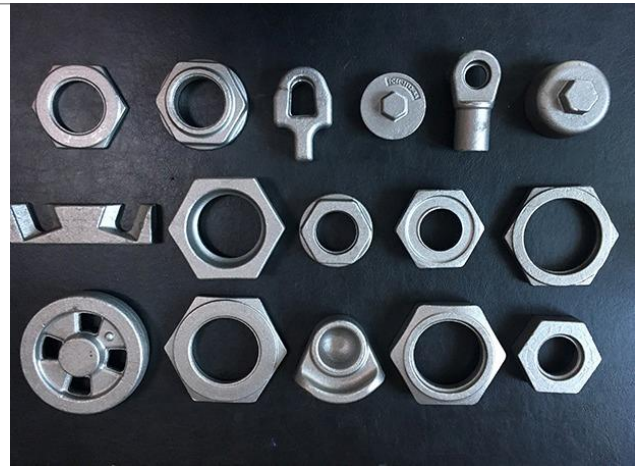

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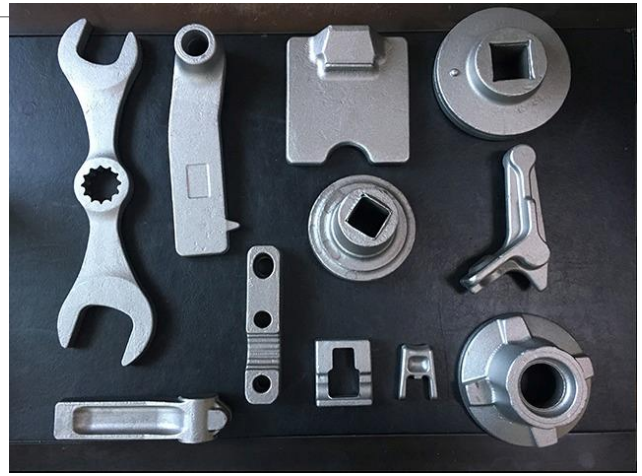

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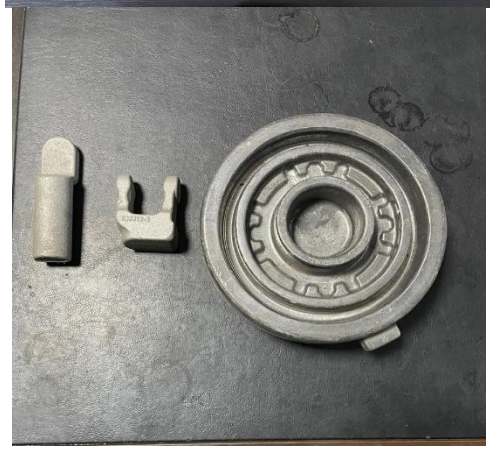


Step by step connecting rod design and production

The summary :

This is a project created by Dovmak to produce connecting rods for performance cars.

The target market is the engine producer/tuning companies who prepares engines for the

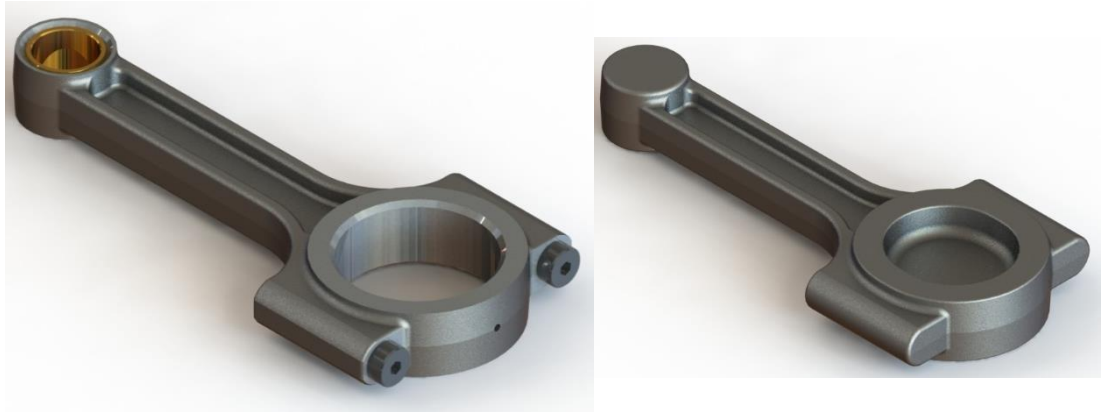
cars that race in WTCC, Nascar and Endurance races like Le Mans.

The forging material for the CR is designed to be 34CrNiMo6 and also Titanium alloy in the

future times of the project.

CR Production Steps :

- Design of the forged part
- Create a mfg control plan
- Mould production
- Forging
- Heat treatment
- Machining
- Control methods



Part and the process design

The design of the part is made by taking a referance from a sample part.

The sample part was scanned via laser scanner and the model of the part was taken into SW.

The forging model was made according to the scanned model.

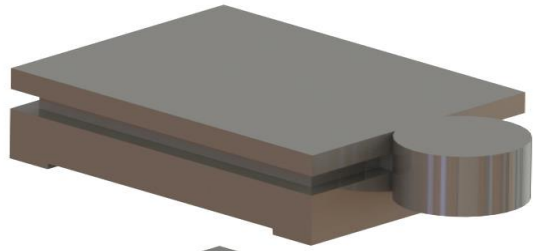
The forging mould design has been carried out.

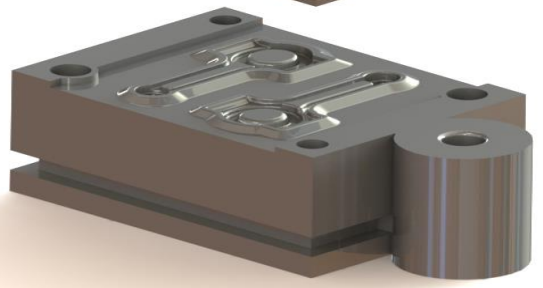
The machining fixtures were designed and the machining process sequences were created.

The heat treatment requirements such as hardness, grain size,inner structure were determined.

The supplier of the parts like bronze housing and the bolt were identified and their Tech. Req.

were shared.





Mfg. Control Plan

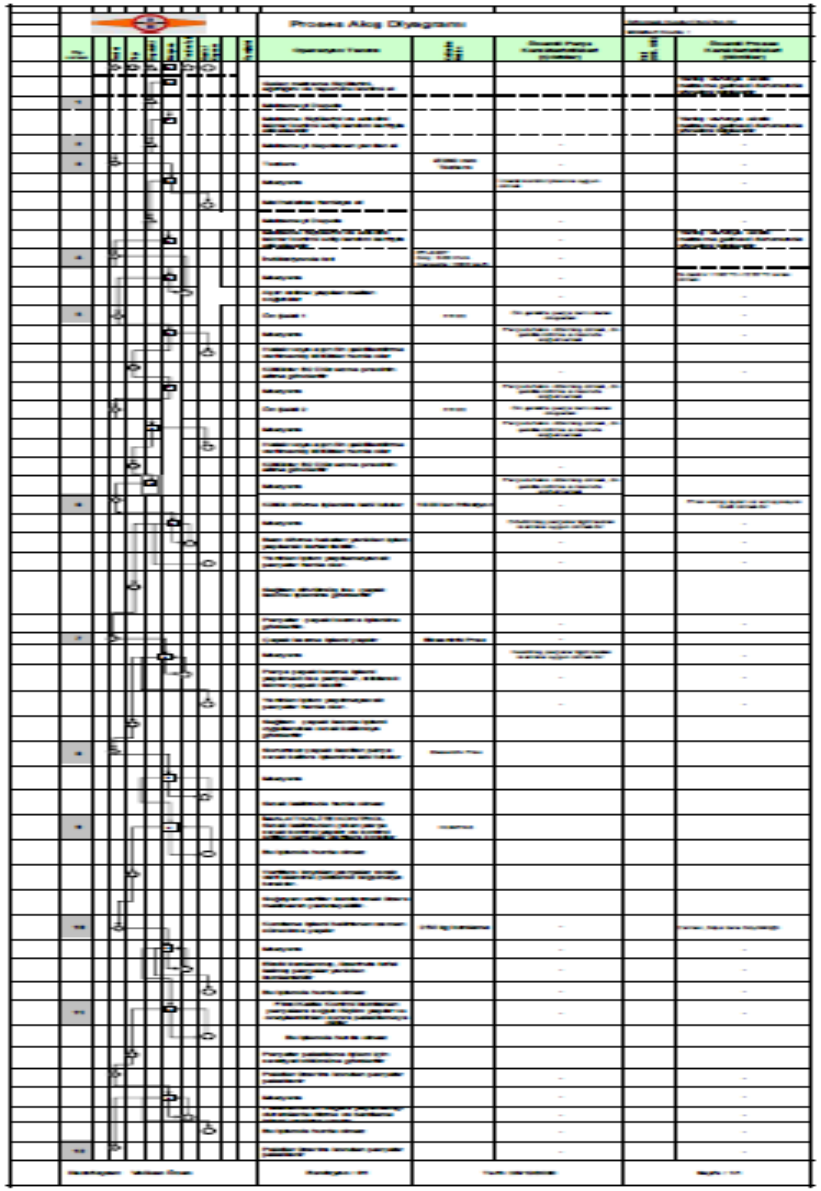
DÖV-MAK	İmalat Kontrol Planı		
Resim Kodu	Müşteri Resim Kodu	Kullanılan malzeme	Kalıp Kodu
DM-02		4340	DM-02
Proses Sırası	Proses		
1	**Testere**		
	Makina Kodu	7	
	Testere Tipi	4/6	
	Kesim Boyutları	Çap 45 Boy 280 mm (3240 GR - 3260 GR)	
	Kesim Zamanı	60 sn - 85 sn	
	Özellikle dikkat edilecek hususlar	Kesimden sonra parça alın yüzeylerinde max 1mm düzelmesellik olacak ve ağırlık sınırları arasında kalınacak.Kasa üzerine mutlaka "TANIM KARTI" koyulacak	
2	**İndüksiyon**		
	Makina Kodu	3	
	İndüksiyon Gücü	10.1	
	İndüksiyon Zamanı	23 sn	
	İndüksiyon Kademesi	500 KWA	
	İndüksiyon Frekansı	2800	
	İndüksiyon Akımı	550	
	Tünel Tipi	Ø30mm - Ø 45 mm	
	Özellikle dikkat edilecek hususlar	Sıcaklık 1200 °C - 1220 °C arasında olacak İşleme alınan malzeme üzerinde " TANIM KARTI" na bakılarak alınacak	
3	**Ön Şekil 1**		
	Makina Kodu	1600 Ton Friksiyon	
	Özellikle dikkat edilecek hususlar	Kalıpda 1 sefer vurulacak	
4	**Ön Şekil 2**		
	Makina Kodu	1600 Ton Friksiyon	
	Özellikle dikkat edilecek hususlar	Kalıpda 1 sefer vurulacak	
5	**Dövme**		
	Makina Kodu	1600 Ton Friksiyon	
	Vuruş sayısı	1 Tam 1 Yarım Vuruş	
	Vuruş basıncı	70 bar	
	Kalkış basıncı	55bar	
	Özellikle dikkat edilecek hususlar	Kalıp yüzeyleri tel fırça ile her vuruştan sonra temizlenecek	
6	**Çapak kesme**		
	Makina Kodu	1-....-9	
	Stroke Aralığı	0-184 mm	
	Çapak kesme sıcaklığı	1000 °C	
	Özellikle dikkat edilecek hususlar	Çapak kesme hattı düzgün olacak	
7	**Ütü**		
	Makina Kodu	14	
	Stroke Aralığı	0-184 mm	
	Ütüleme sıcaklığı	900 °C	
	Özellikle dikkat edilecek hususlar	Ütü oparasyonundan sonra düzelemsellik max 0,2 mm olacak	
8	**Kontrollü soğutma**		
	Özellikle dikkat edilecek hususlar	Parça elle tutulaca seviyeye gelinceye kadar varlerde duracak ve variller tanımlı olacak	
9	**Kumlama**		
	Makina Kodu	13	
	Kumlama Zamanı	7 -15 dk	
	Kumlama Tipi	Odalı kumlama	
	Özellikle dikkat edilecek hususlar	Parça yüzeyinde tufal temizlenecek şekilde kumlama olacak	
10	**ısıl işlem**		
	Paket	Dövmak logolu palet üstü koli	
	Sertleştirme Değerleri	1000 N/mm2 - 1100 N/mm2	
11	**İşleme**		
	Makina Kodu	cnc-3	
	Özellikle dikkat edilecek hususlar	Parça teknik resim toleransına göre işlenecek	

	HAZIRLAYAN	ONAYLAYAN
İsim	Volkan Özen	Erdinç Uyar
İmza		

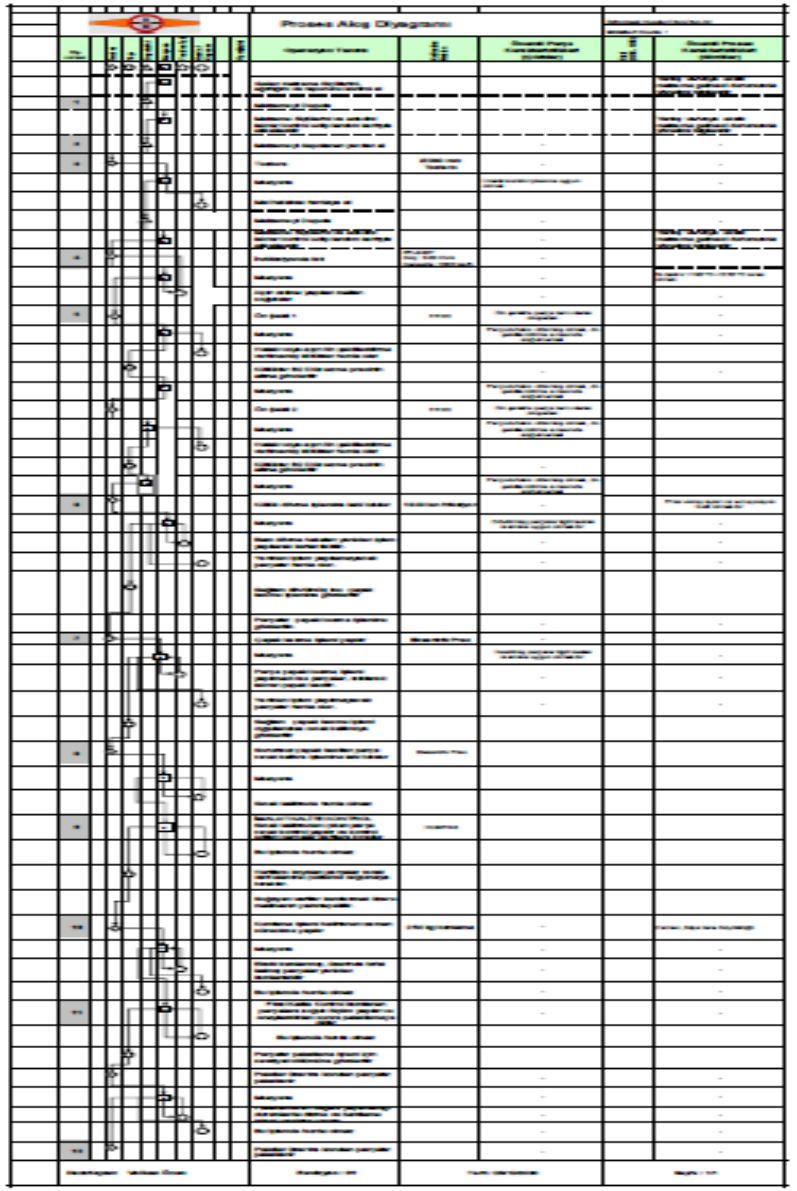
Control plan for production

An example of Process Flow Diagram

PFD for forging



PFD for machining



Mould Manufacturing

The designs and CAD models of the moulds were made via SW

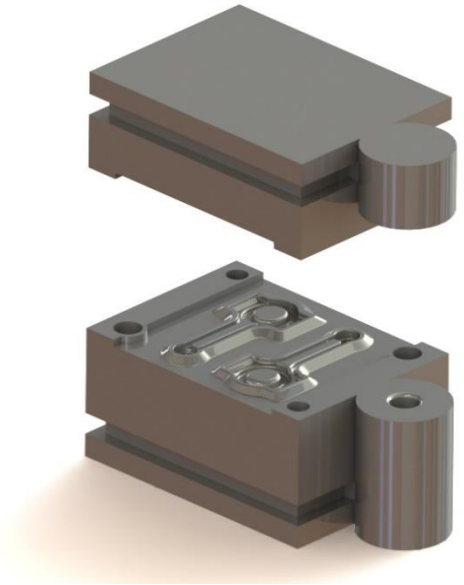
The CAM modules are then created and sent to VMC for machining of the moulds.

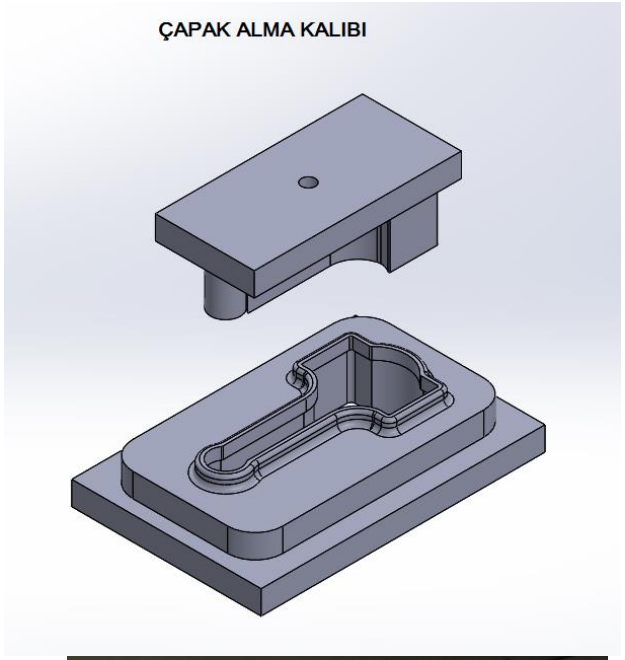
Depending on the shape of the part, we need to make preforming.

Preforming moulds were carefully designed to avoid any fault in forging.

The material of the mould s a special kind of ht working steel.

Special tooling is used to make the surface finishing of the moulds which is key factor to get a good looking forged parts.

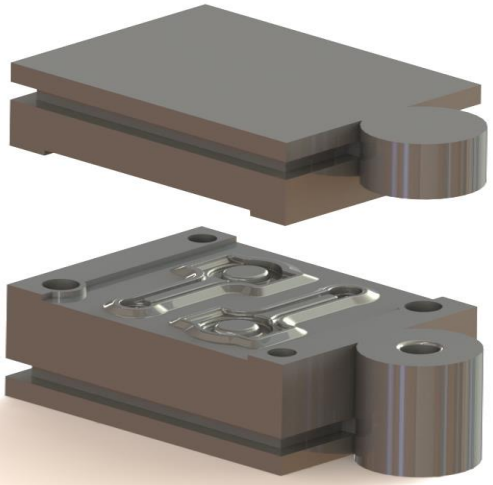




Producing of the forged part

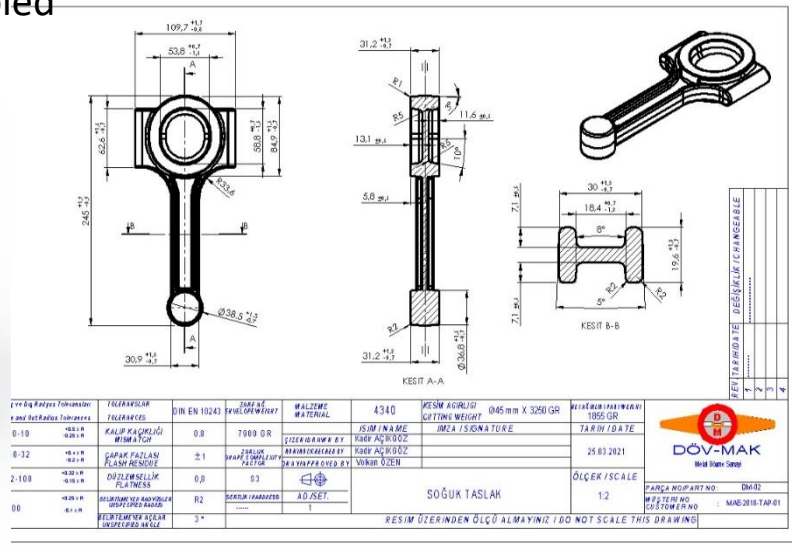
The raw material is AISI 4340 (34CrNiMo6) which is one of the hard to be forged metals.

RM is heated up to 1200 – 1240 C by induction heating furnaces and its temperature is 100% checked by laser sensors. Only the parts with required temperature is allowed to be forged.
2 preforming processes are applied on the heated metal. The last forming is in the 3 rd step.



The mould temperature is another asset in forging. It is continously checked by hand detectors until it reaches to required level. This is obtained by not only the heated part but Also also because of the friction created by the flow of the raw material in the mould.

To heat the raw material to the required temperature and to keep the temperature within the tolerances are strongly dependant to the structure of the machine and how well the electronic parts in the induction heater is cooled



Machining

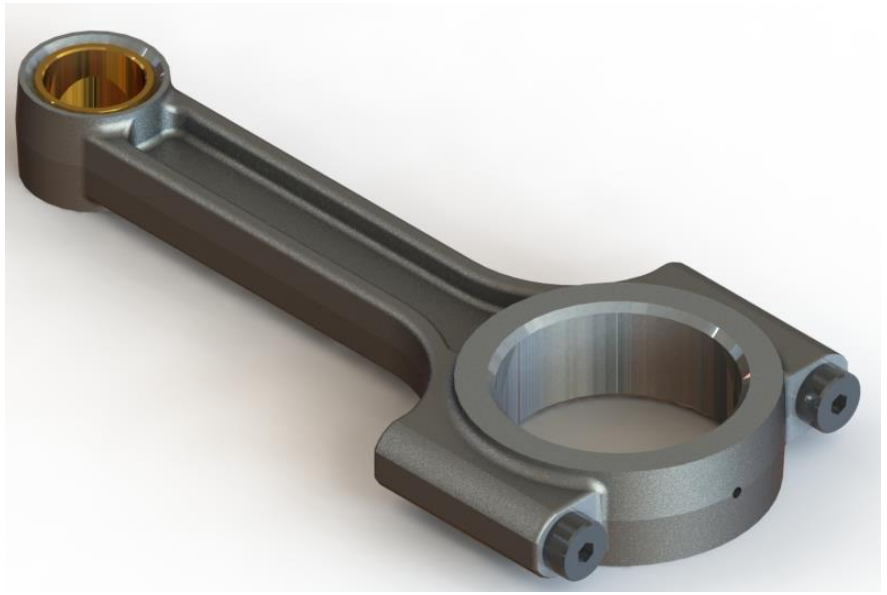
Machining is carried out via CNC machines.

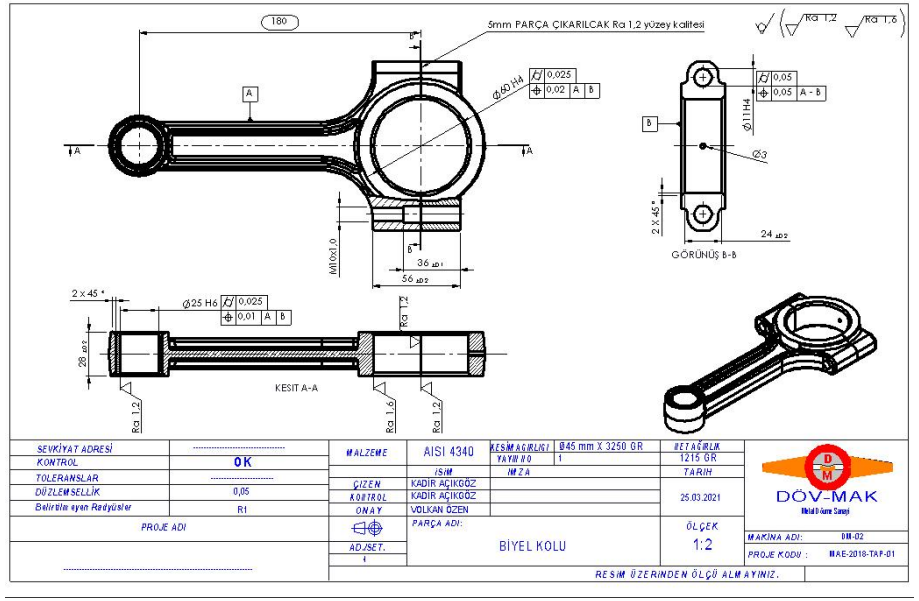
There are 4 CNC machines, 3 of which is VMC and the other is CNC lathe.

As our tooling department is often using CAD/CAM methods in designing

the moulds and fixtures, we are taking the advantage of that during machining the

parts at our CNC machines. Please see one of the parts we are machining.





Control methods

We carry out periodical quality checks during and after forging.

The parts we forge are cooled down and we apply eye control,

the measurings on the part.

We also appy some dimensional controls when the part is hot.

Some parts are measured at our CMM machine.

CMM machine is also used for reverse engineering.

Hardness control is also applied especially to the parts that are

contolled cooled down through air tunnels

Our machine list for forging process :

We have 5 forging lines . Please see below the list and the power of the machines :

Line 1 :

600 tons main press

250 kVa indcution heater

200 ton mechanical press

200 ton mechanical press

Line 2 :

1000 ton main press

250 kva induction heater

160 kg air hammer

250 tons mechanical press

125 tons mechanical press

Line 3 :

1300 ton main press

300 kva induction heater

160 kg air hammer (common)

200 tons mechanical press

200 ton mechanical press

Line 4 :

1600 ton main press

500 kVa induction heater

300 kg air hammer

315 ton machanical press

250 ton mechanical press

200 ton mechanical press

Line 5 :

2000 ton main press

600 kva induction heater

250 kg air hammer

400 ton mechanical press

250 ton mechanical press

250 ton mechanical press

The closed area for forging only is 2250 m2.

Our machine list for machining :

We have the following CNC and conventional machined for machining :

2 Vertical Machinnig Centers with 1020 mm X axis travel

2 Vertical Machining Centers with 1250 mm X axis travel

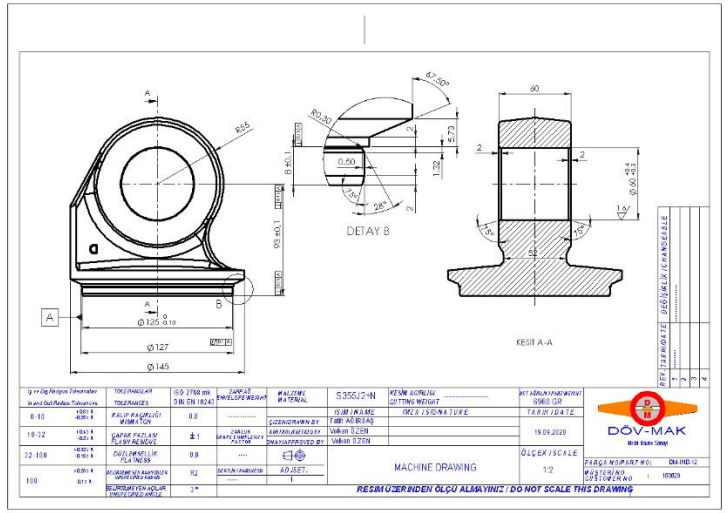
1 CNC lathe with 12 inch chuck

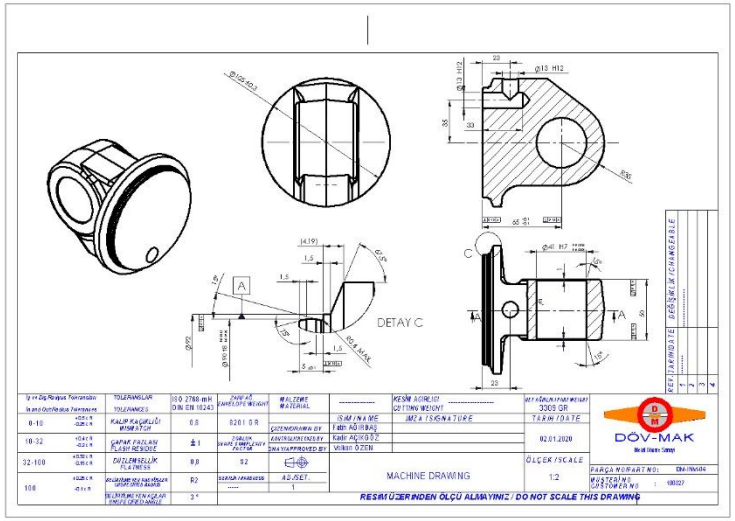
4 universal lathes

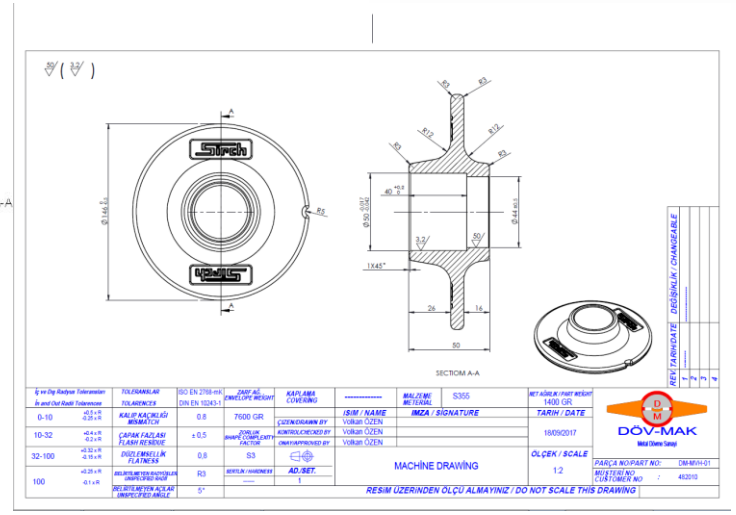
1 semi automatic milling machine

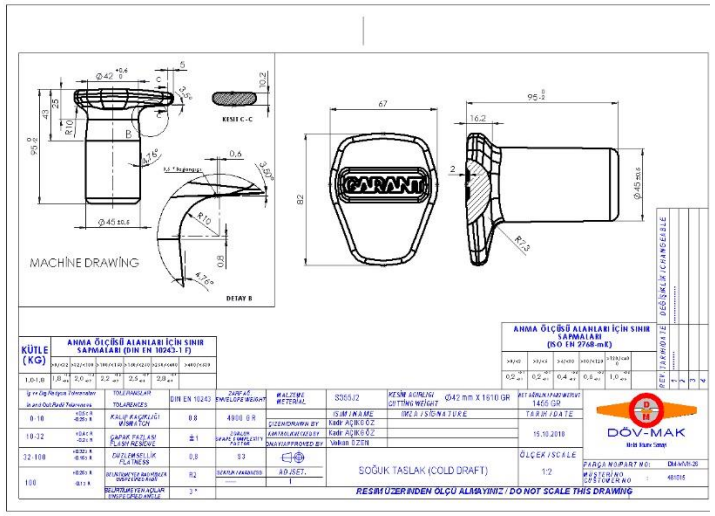
1 semi automatic drill

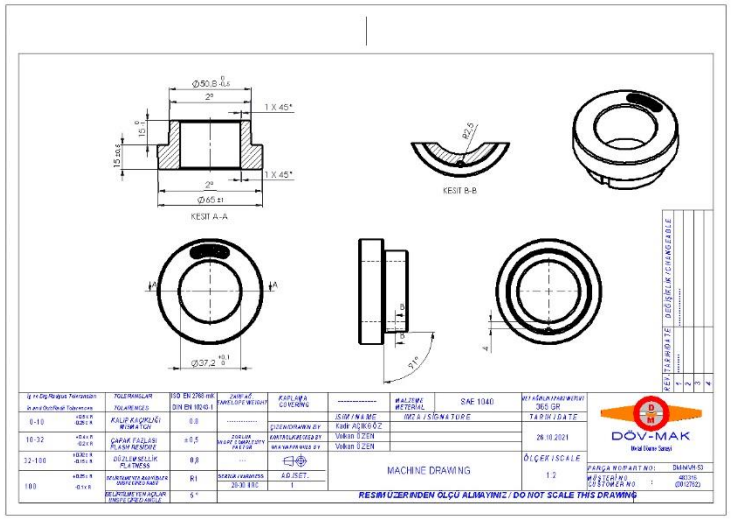
Some drawings of the parts we are machining :

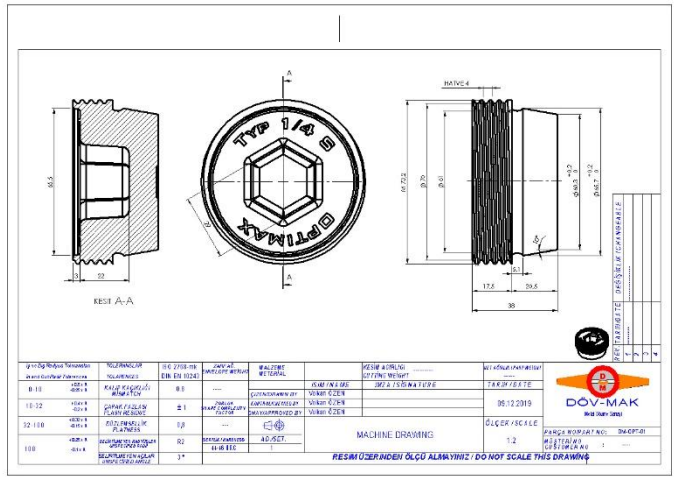












THANK YOU