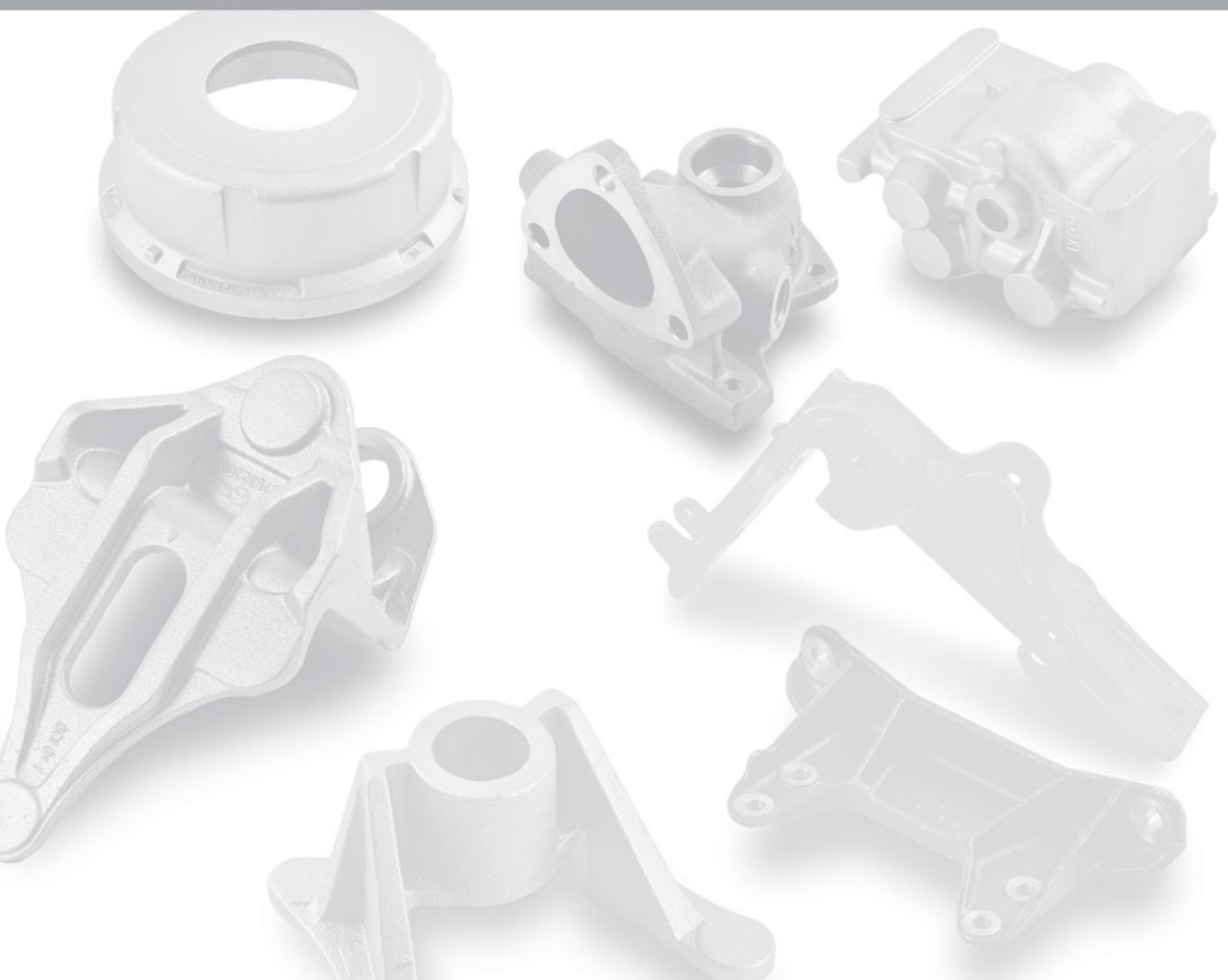




 **ÇEMAS**
CASTING INDUSTRY INC.

 ÇEMAS





ÇEMAŞ CASTING INDUSTRY INC.

ÇEMAŞ Foundry is a privately owned company which was founded by the Turkish State in 1976 in Kırşehir, Turkey to meet cast grinding ball needs of the domestic cement and mining industries. The Foundry is situated on 150.000 m² land of which 22.000 m² is closed. ÇEMAŞ was acquired by Işıklar Holding in 1995 and currently serves its local and international clients and continuously improves its quality in accordance with ISO 9001 and ISO/TS 16949 Quality Management Systems. ÇEMAŞ is a publicly traded corporation whose stocks are quoted in BIST (Istanbul Stock Exchange) since 2010.

ÇEMAŞ increased its capacity to 30.000 tons with new investments (DISA and HWS molding lines) and is serving its local and international markets with gray iron and ductile iron casting parts for automotive, durable goods and machinery industries and cast grinding media for cement and mining industries. The Foundry has 4 moulding (2 DISA, HWS and HWS-3) lines, 8 induction furnaces (ABB), 2 sand mixers, sand cooler and cold box machines.

In 2008, a new machining facility was brought into operation, which serves now with 31 state-of-the-art CNC machines to enable the company to supply machined parts to its industrial clients. ÇEMAŞ has a very flexible production background that can deliver parts ranging from 80 grams to 180 kgs and all kinds of high quality ductile and gray iron as well as alloyed steel with the capacity to machine these parts for end-users.

CASTING SIMULATION

In order to reduce failure risks and produce in an optimum way, mould filling and solidification simulations are performed. Plate layout and gate-feeder is designed in a flawless way.

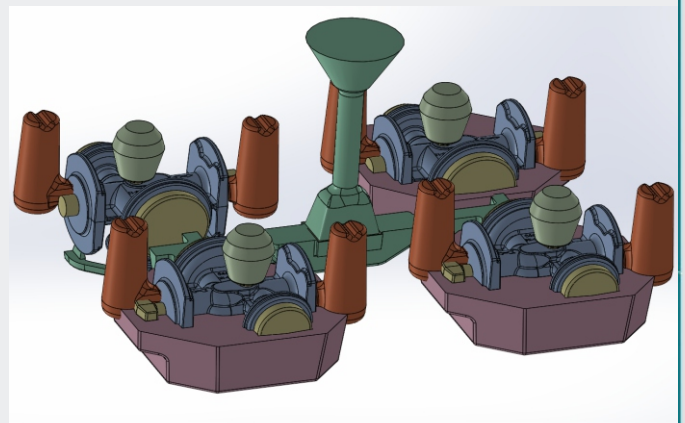
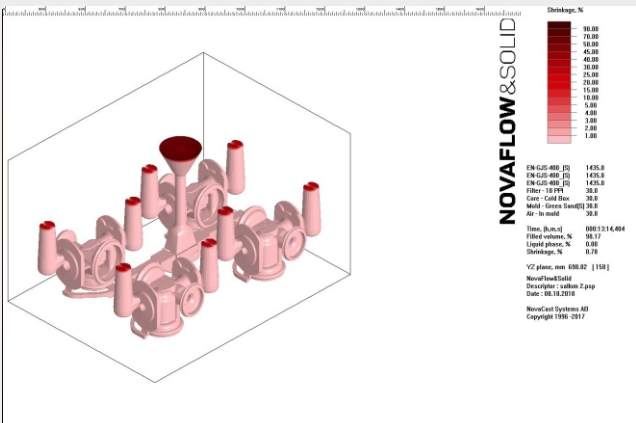
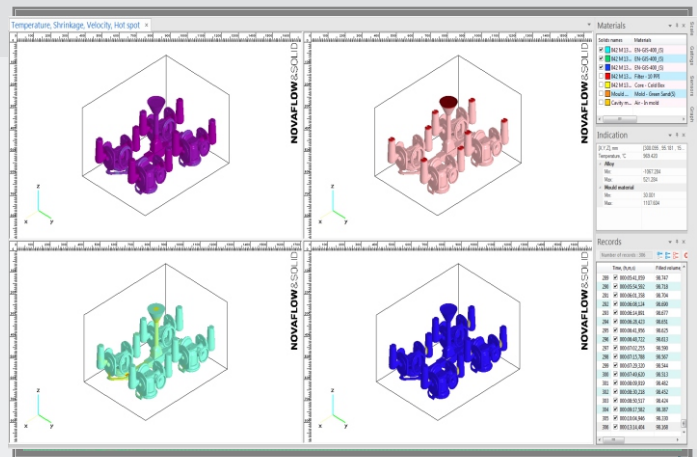
Metallurgical data taken from ATAS thermal analyser equipment provides the environment to work on the simulation program with real foundry conditions.

Through by Simulation;

During filling the moulds' liquid metal velocity; pressure; direction; turbulence contact of cold area etc Cast product solidification period. Hot points on cast parts, points have to be fed and modules have to be determined

Simulation data are as stated in the following:

1. Coordinates of cast hole and dimension of worked grades,
2. Choosing alloy material and properties of cast iron,
3. Gating cross section and flow parameters,
4. Properties that control the heat inside the mould,
5. Choosing cast method, gravity, low pressure, high pressure
6. Cooler used in moulding, insulation and exothermic coats.
7. Place of gating and inlet transitions,
- 8 .Filters,
9. Cast temperature,
- 10.Slag particles,
11. Heat transfer coefficient,
12. Liquidus and solidification range,
13. Hidden fusion temperature,
14. Solidification line,
15. Volume change (shrinkage) line



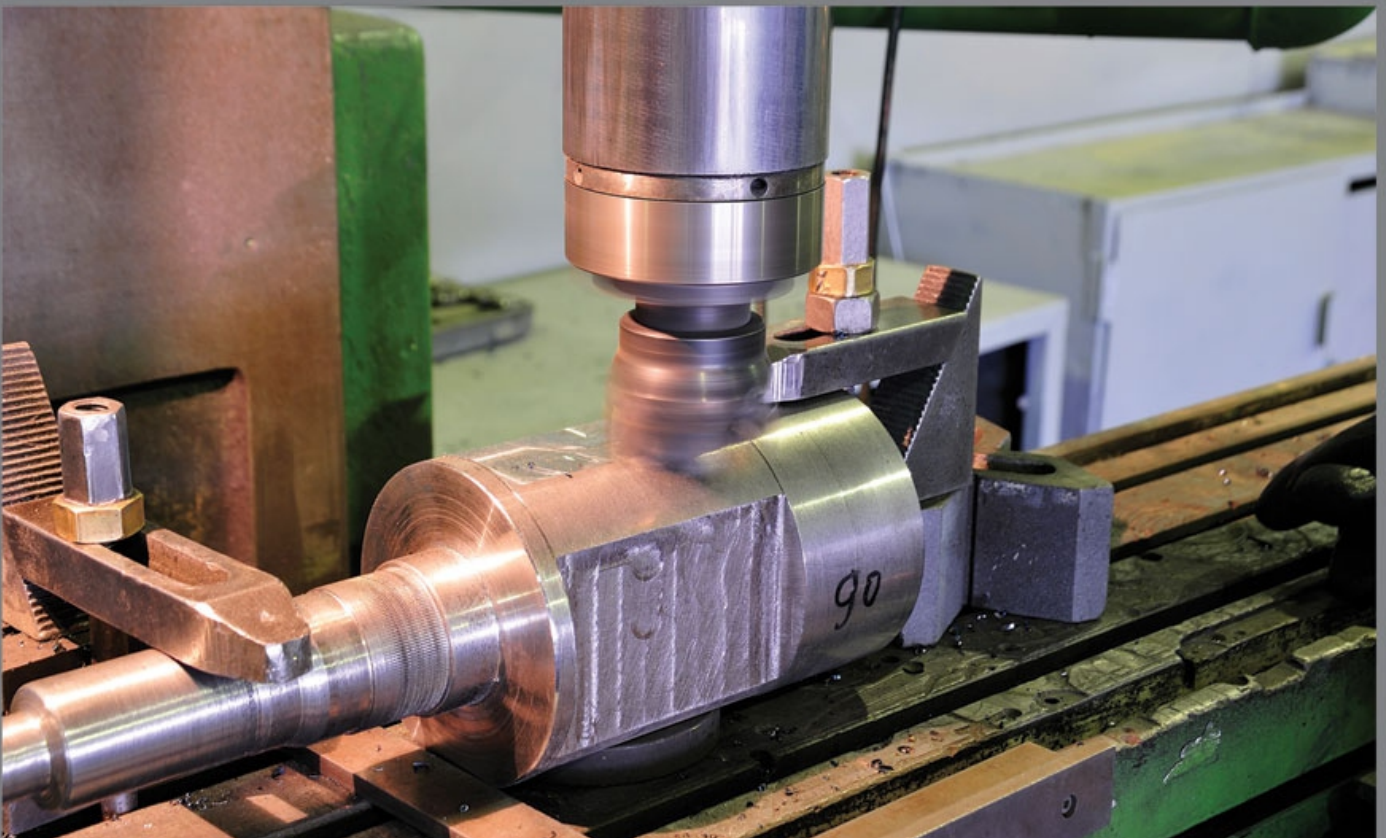


LER VH 100 CNC Vertical Milling Machine

PATTERN SHOP

Pattern and core box design are done according to clients' two and three dimensional technical drawings by CAD/CAM solid modelling.

These patterns and core boxes are made of wood, araldite, aluminum or steel material in ÇEMAS' own pattern shop



CORE MAKING SHOP

At ÇEMAŞ Foundry, core is produced by coldbox and shell type machines

Cold-Box System

Foundry Automation: 25 lt. capacity, automatic, 60 mould/hr

Ropperweg: 12,5 lt. capacity, automatic, 30 mould/hr

Corewolf, 30 lt capacity, automatic, 30 mould/hr

Ç80, 80 lt capacity, automatic, 40 mould/hr

Shell sistem : 25 lt. capacity, automatic, 60 mould/hr

Manual Core Making

- CO₂ system
- UF/PF Resin
- Improved resin

Core drying Furnace : Natural gas.

Automatic coating preparation mixer



SAND PREPARATION

Georg Fischer SAM 6/70 Sand mixer 60 ton/hr full automatic ,SMC Auto control unit.

Webac 75-B Sand mixer 30 ton/hr full automatic.

Schenck sand cooler 90 ton/hr capacity ,full automatic.

According to parts, specific control plans are prepared and the following tests are done periodically

Sand Test Equipment:

- 1) PST: Moulding capability measuring device
- 2) PRA: Test sample preparation
- 3) PED: Gas permeability test equipment
- 4) PVG: Compressibility test equipment
- 5) PFZ:Wet tensile equipment
- 6) PFG: Universal tensile
- 7) PSR: Press tensile
- 8) PNM: Low pressure scale
- 9) PQS: Chopping tensile



- 10) PSP: Cracking tensile
- 11) PHD: Dry press tensile
- 12) MF-30: Humidity measurement
- 13) ST3300-E: Accurate balance
- 14) M1609-P: Crematorium
- 15) PMP: Methylene blue
- 16) PMK: Digital Methylene blue
- 17) PNZ-D :Wet tensile measurement
- 18) PMT :Automatic complex sand test equipment.

MELTING /CASTING

Total 8 induction furnaces:

4 ABB Induction Furnace 3.0 tons
2 EGES Induction Furnace 2.0 tons
2 EGES Induction Furnace 6.0 tons

2 ABB and 4 EGES furnaces are operated by
"Twin Power System" and operation is fully
computer controlled.

Total molten metal capacity: 14 tons/h

Automatic Pouring Furnace
ABB OCC 50 capacity 6,5 tons



MOULDING LINES

ÇEMAŞ has 4 (2 horizontal, 2 vertical) moulding lines
We can mould cast parts in a range between 0.08 kg
and 80 kgs.

DISAMATIC 2013 LP (Vertical Flaskless Moulding,
AMC: 18m, SBC speed control)

Capacity : 180 moulds/hour
Mould Size : 480x600x350 mm
Weight Range : 0,10 - 20,00 kg

DISAMATIC 2013 MK (Vertical Flaskless Moulding,
AMC: 18m, SBC speed control)

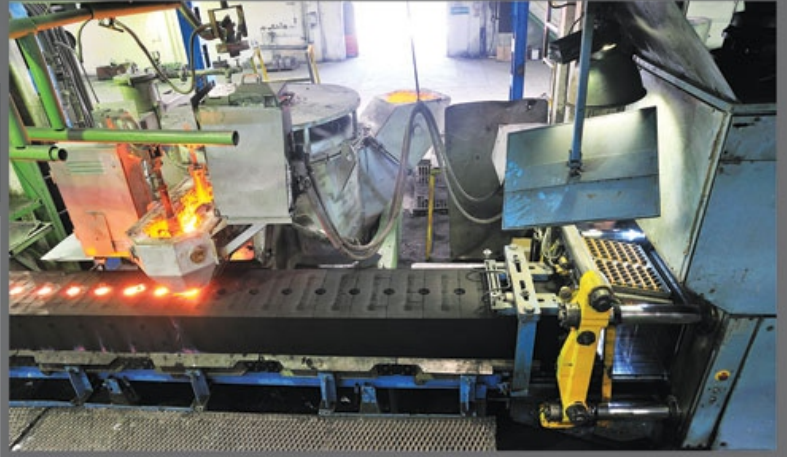
Capacity : 260 moulds/hour
Mould Size : 480x600x350 mm
Weight Range : 0,10 - 20,00 kg

HWS SINTO HSP-2D (Horizontal Moulding)

Capacity : 40 moulds/hour
Mould Size : 600x800x250+250 mm
Weight Range : 0,50 - 70,00 kg

HWS SINTO HSP-3 (Horizontal Moulding)

Capacity : 30 moulds/hour
Mould Size : 900x750x300+250 mm
Weight Range : 10,00 - 180,00 kg



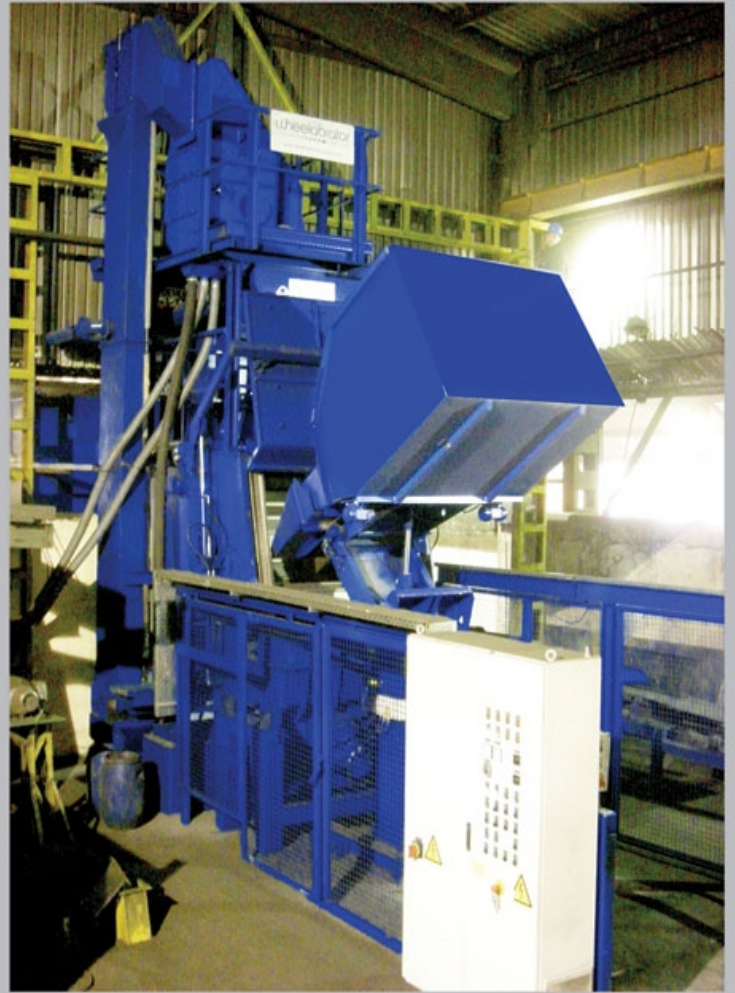
PRODUCT PREPARATION

Cleaning after casting of the products are performed by six automatic shot blasting machines

Wheelabrator Berger, drum type,
Taifun, drum type
Endümak, sling type,
Saygılı, sling type,
BSM, sling type,
Zemak, sling type.
OMSG

In order to protect products from corrosion, hot air dryer painting line exists.

The feeders and gatings are separated from products by hydraulic brakers on shaky sieve



QUALITY CONTROL

Quality Objective

Our aim is to be a globally recognised foundry living up to customer, employee, shareholders' and suppliers' expectations
Making up continuous improvement a principle of production and service.
To be preferred with our quality and service.

ÇEMAŞ is taking as reference continuous improvement and develops process control methods.

ÇEMAŞ has all modern equipment and machines for casting process:

- Raw material analysis
- Liquid metal analysis
- Sand analysis
- Metallographic analysis
- Crack control
- Three dimensional CNC measurement
- Non destructive material
- Ultrasound test equipment
- X-ray



BUREAU VERITAS
Certification



ÇEMAŞ DÖKÜM SANAYİ A.Ş.

ANKARA ASFALTI 12.KM.
40100 KIRŞEHİR, TURKEY

Bureau Veritas Certification Holding SAS – UK Branch certify that the Management System of the above organisation has been audited and found to be in accordance with the requirements of the management system standards detailed below

Standard

ISO 9001:2015

Scope of certification

MANUFACTURING OF GREY AND NODULAR IRON CAST AND MACHINED PARTS

Original cycle start date: 28 February 2013

Expiry date of previous cycle: 14 September 2018

Certification / Recertification Audit date: 19 July 2018

Certification / Recertification cycle start date: 19 September 2018

Subject to the continued satisfactory operation of the organization's Management System, this certificate expires on: 18 September 2021

Certificate No: TR007460 Version No: 1 Revision date: 19 September 2018

İBRAHİM TAGAY
Signed on behalf of
BVCH SAS UK Branch



0008

Certification body address: 5th floor, 66 Prescot Street, London, E1 8HG, United Kingdom
Local office: Esas Maltepe Otopark Altayışme Mah. Çamlı Sok. No: 21 Kat: 8 34843 Maltepe, İstanbul, Turkey
Further clarifications regarding the scope of this certificate and the applicability of the management system requirements may be obtained by consulting the organization.
To check this certificate validity please call +90 216 518 40 50.
BV_S_37_Rev.A00

UKAS Certificate Template single site rev3.3 1 / 1 January 30, 2017

BUREAU VERITAS
Certification



Certificate of Approval

Awarded to

Çemas Döküm Sanayi A.S.

Ankara Asfaltı 12. Km
40100 - Kırşehir - Turkey

Bureau Veritas Certification certify that the Quality Management System of the above organisation has been audited and found to be in accordance with the requirements of

IATF 16949

and the applicable customer specific requirements



SCOPE
Manufacturing

PERMITTED EXCLUSION(S)

8.3 - Design and development of products and services
PRODUCT(S) DELIVERED

Grey and Nodular Iron Cast and Machined Parts

Date of certification: 19 September 2018

Date of expiration: 18 September 2021

Bureau Veritas Certification Certificate N°:TUR-21193/TS

IATF Certificate N°: 334536

For Bureau Veritas Certification Holding s.r.l. Triangle di Forno, 4 Corsia del Triangle, 12000 Pinerolo - France
(The official documents are in English. Any translations of this document shall be used for reference only)

Page 1 of 1

BUREAU VERITAS
Certification



ÇEMAŞ DÖKÜM SANAYİ A.Ş.

ANKARA ASFALTI 12.KM.
40100 KIRŞEHİR, TURKEY

Bureau Veritas Certification Holding SAS – UK Branch certify that the Management System of the above organisation has been audited and found to be in accordance with the requirements of the management system standards detailed below

Standard

ISO 14001:2015

Scope of certification

MANUFACTURING OF GREY AND NODULAR IRON CAST AND MACHINED PARTS

Original cycle start date: 11 July 2013

Expiry date of previous cycle: 10 July 2016

Certification / Recertification Audit date: 18 May 2016

Certification / Recertification cycle start date: 08 July 2016

Subject to the continued satisfactory operation of the organization's Management System, this certificate expires on: 07 July 2019

Certificate No: TR004518-1 Version No: 2 Revision date: 20 August 2018

İBRAHİM TAGAY
Signed on behalf of
BVCH SAS UK Branch



0008

Certification body address: 5th floor, 66 Prescot Street, London, E1 8HG, United Kingdom
Local office: Esas Maltepe Otopark Altayışme Mah. Çamlı Sok. No: 21 Kat: 8 34843 Maltepe, İstanbul, Turkey
Further clarifications regarding the scope of this certificate and the applicability of the management system requirements may be obtained by consulting the organization.
To check this certificate validity please call +90 216 518 40 50.
BV_S_41_Rev.A00

UKAS Certificate Template single site rev3.3 1 / 1 January 30, 2017

BUREAU VERITAS
Certification



ÇEMAŞ DÖKÜM SANAYİ A.Ş.

ANKARA ASFALTI 12.KM.
40100 KIRŞEHİR, TURKEY

Bureau Veritas Certification Holding SAS – UK Branch certify that the Management System of the above organisation has been audited and found to be in accordance with the requirements of the management system standards detailed below

Standard

OHSAS 18001:2007

Scope of certification

MANUFACTURING OF GREY AND NODULAR IRON CAST AND MACHINED PARTS

Certification cycle start date : 08 July 2016

Subject to the continued satisfactory operation of the organization's Management System, this certificate expires on: 07 July 2019

Original certification date: 11 July 2013

Certificate No. TR004520- Version No: 1 Revision Date: 08 July 2016

SEÇKİN DEMİRALP
Signed on behalf of
BVCH SAS UK Branch



008

Certification body address: 66 Prescot Street, London, E1 8HG, UK
Local office: Bureau Veritas Gözetim Hizmetleri Ltd.Şti.
Aydınevler Sanayi Çaddeesi, Centrum İş Merkezi, No:3 Kat:1 34854, Küçükyalı, İstanbul, TURKEY
Further clarifications regarding the scope of this certificate and the applicability of the management system requirements may be obtained by consulting the organization.
To check this certificate validity please call +90 216 518 40 50.
BV_S1_08_Rev.01

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DUCTILE CAST IRON STANDARDS							
ASTM A536		60-40-18	60-42-10 65-42-12	70-50-05	80-55-06 80-60-03	100-70-03	120-90-02
DIN 1693	GGG 40.3	GGG 40		GGG 50	GGG 60	GGG 70	GGG 80
NF A32-201		FGS 370-1	FGS 400-12	FGS 500-7	FGS 600-3	FGS 700-2	FGS 800-2
BS 2789	400/18 L20	400-18	420-12	500-7	600-3	700-2	800-2
UNI 4544		GS 370-17	GS 400-12	GS 500-7	GS 600-3	GS 700-2	GS 800-2
SAE J434		D 400		D 500		D 700	D 800

GREY IRON STANDARDS								
ASTM A48	Class 20B	Class 25B	Class 30B	Class 35B	Class 40B	Class 45B/50B	Class 55B	Class 60B
DIN 1691	GG 15	GG 20		GG 25		GG 30	GG 35	
NF A32-101	Fonte 15D	Fonte 20D		Fonte 25D		Fonte 30D	Fonte 35D	Fonte 40D
BS 1452	Grade 150	Grade 180	Grade 220		Grade 260	Grade 300	Grade 350	Grade 400
UNI 5007	G 15	G 20		G 25		G 30	G 35	



MACHINING SHOP

According to customer expectations to supply finished product, machining shop was founded in 2008. The following machinery park exists in the machining shop that is growing continuously.



MULTITASKING TURNING CENTER



HORIZONTAL MACHINING CENTER



CNC VERTICAL MILLING MACHINE



CNC LATHE



VERTICAL TURNING MACHINE



HORIZONTAL TURNING MACHINE



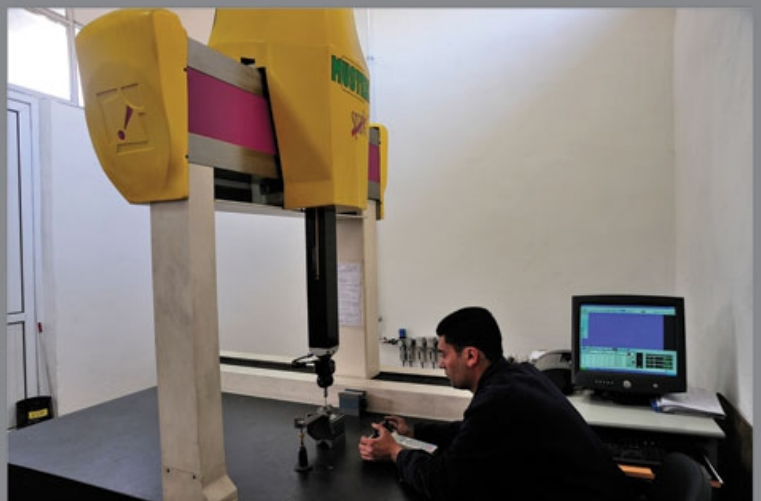
HORIZONTAL MACHINING CENTER



HORIZONTAL MACHINING CENTER



VERTICAL LATHE WITH CHUCK



MACHINING SHOP

MACHINERY PARK

NO	MACHINERY	DESCRIPTION
1	LER TC200B	2-axis 10" horizontal lathe with chuck
2	NEX 108	2-axis 10" horizontal lathe with chuck
3	GOODWAY GS260	2-axis 10" horizontal lathe with chuck
4	LER TCY200	10" C and Y-axis vertical lathe with chuck
5	YOU JI 500E	15" C-axis vertical lathe with chuck
6	YOU JI 500E+C	18" C-axis vertical lathe with chuck
7	MAKINO S33	Double pallet (600x400) vertical machining center
8	MAKINO A51-1	400 mm horizontal machining center
9	MAKINO A51-2	400 mm horizontal machining center
10	OKUMA MA500 HB-1	500 mm horizontal machining center
11	OKUMA MA500 HB-2	500 mm horizontal machining center
12	OKUMA MA400 HA-1	400 mm horizontal machining center
13	OKUMA MULTUS B400W	CNC Turn Mill Center with double 12" spindle and opposite chuck
14	OKUMA LB3000 EX-MYWx800	10" C and Y-axis horizontal lathe with chuck
15	OKUMA LB4000 EX-CMYx750	10" C and Y-axis horizontal lathe with chuck
16	OKUMA MA500 HB-3	500 mm horizontal machining center
17	OKUMA MA400 HA-2	400 mm horizontal machining center
18	OKUMA MA400 HA-3	400 mm horizontal machining center
19	OKUMA GENOS L-400-1	2-axis 10" horizontal lathe with chuck
20	OKUMA GENOS L-400-2	2-axis 10" horizontal lathe with chuck
21	DOOSAN PUMA V550M	21" C-axis vertical lathe with mirror
22	FUJI CSD 300	10" robot-controlled horizontal machining center with mirror, 2 spindles and automatic measure control unit
23	OKUMA MF-46VA	Double pallet (760x460) vertical machining center
24	MAKINO a51 nx	400 mm horizontal machining center
25	MAKINO a51 nx	400 mm horizontal machining center
26	MAKINO a51 nx	400 mm horizontal machining center
27	MAZAK QT200 L	2-axis 8" horizontal lathe with chuck
28	MAZAK HCN 4000	400 mm horizontal machining center (6 APC)
29	MAZAK HCN 4000	400 mm horizontal machining center (6 APC)
30	MAZAK HCN 4000	400 mm horizontal machining center (6 APC)
31	MAZAK HCN 4001	401 mm horizontal machining center (2 APC)

AUTOMOTIVE INDUSTRY



MACHINE INDUSTRY



WHITE GOODS INDUSTRY



GRINDING MEDIA BALLS

GRINDING MEDIA	DIAMETER (mm)	HARDNESS	% C	% Cr	ÇEMAŞ LINE
BALL	15,17,20,25,30	60-66	2,9-3,1	12-14	Rugged Alloy
BALL	35,40,50	60-65	2,5-2,7		
BALL	60,70,80,90,100,110	59-64	2,1-2,3		
BALL	15,17,20,25,30	60-66	2,9-3,1	17-19	Super Crom
BALL	35,40,50	60-65	2,5-2,7		
BALL	60,70,80,90,100,110	59-64	2,1-2,3		
BALL	15,17,20,25,30	60-66	2,9-3,1	23-26	Utter Crom
BALL	35,40,50	60-65	2,5-2,7		
BALL	60,70,80,90,100,110	59-64	2,1-2,3		
BALL	15,17,20,25,30	60-66	2,9-3,1	29-31	Supreme Crom
BALL	35,40,50	60-65	2,5-2,7		
BALL	60,70,80,90,100,110	59-64	2,1-2,3		
BALL	15,17,20,25,30	60-67	2-3	5-6	ECO Crom
CYLPEBS (DxH)	12x12, 16x16, 19x19, 22x22, 24x24, 25x25, 28x28, 30x30, 35x35,	60-65	2,9-3,1	12-14	Rugged Alloy
CYLPEBS (DxH)	12x12, 16x16, 19x19, 22x22, 24x24, 25x25, 28x28, 30x30, 35x35,	60-67	2-3	5-6	ECO Crom





www.cemas.com.tr

www.isiklar.com.tr

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