

1. PURPOSE:

This document defines general technical delivery conditions of round and square carburizing&quenching materials that Olimpa Makine San. Ve Tic. A.Ş. (SHORTLY Olimpa) uses for production of hydraulic breakers. The required material dimensions and quantity will be informed with order.

2. SCOPE:

This document is an attachment of “inquiry letter” and includes following specifications of delivered materials:

- Chemical composition and mechanical properties.
- Dimension and tolerance
- Delivery conditions

3. PRODUCTION:

Steel production information are given as below. If Olimpa needs an information about production, steel supplier will be responsible to give required information and inform the changes about production method.

3.1 Steel Production Method:

- 3.1.1 In Electric Arc Furnace
- 3.1.2 Boiling Method (Killed steel)
- 3.1.3 Vacuum Degassing
- 3.1.3.1 For Round Materials; Reduction ratio should be min. 6:1

3.2 Chemical Composition (%)

- The chemical composition is given by following table-1

Grade	Analysis	C	Mn	P	S	Si	Cr	Mo	Ni	Cu	Al	
30CrNiMo8	Dia.≤85	0,26 0,34	0,30 0,60	0,035 Max.	0,035 Max.	0,40 Max.	1,80 2,20	0,30 0,50	1,80 2,20			

Grade	Analysis	C	Mn	P	S	Si	Cr	Mo	Ni	Cu	Al	
30CrNiMo8	Dia.>85	0,26 0,34	0,50 0,80	0,035 Max.	0,035 Max.	0,40 Max.	1,80 2,20	0,30 0,50	1,80 2,20			

Table-1 Chemical Composition



TECHNICAL REQUIREMENTS AND CONDITIONS FOR PURCHASE ORDER

- Unless be informed the inclusion, the values on the Table-2 are valid.

Element	% Rate
Cu	$\leq 0,20$
Sn	$\leq 0,030$
Al	0,015 – 0,040
N	$\leq 0,012$ (120 ppm)
H	$\leq 0,0002$ (2ppm)
Cu+10 Sn	$\pm 0,60$

Tablo-2 Residual Elements

3.3 Mechanical Properties

See reference Table-3

Heat Treatment	ØDia. (mm)	Re min. N/mm ²	Rm N/mm ²	A min. %	KV min. J
+QT (Quenched+tempered)	≤ 16	1050	1250-1450	9	
	16-40	1050	1250-1450	9	30
	40-100	900	1100-1300	10	35
	100-160	800	1000-1200	11	45
	160-250	700	900-1100	12	45

Tablo-3 Mechanical Properties

3.4 HardenabilityBand

- The hardenability band should be according to EN 10084 as given following Table-4

Grade	Hardness HRC	Distance from end.													
		1,5	3,0	5,0	7,0	9,0	11,0	13,0	15,0	20,0	25,0	30,0	35,0	40,0	50
30CrNiMo8	Max.	56	56	56	56	55	55	55	55	55	54	54	54	54	54
	Min.	48	48	48	48	47	47	47	46	46	45	45	44	44	43

Table-4 Hardenability Band

3.5 Non-metalicInclusions

Non-metalicInclusions level (K4 max.) should be 15, according to DIN 50602.

3.6 Grain Size

Grain Size should be 5-8

3.7 HeatTreatment

- Annealed, max. 240 HB.

3.8 Ultrasonic Test

% 100 Ultrasonic test should be made with level SEP 1921 D/d and there shouldn't be any segregation, crack or cavity failures in material. Ultrasonic failures should be ≤ 3 . (SEP 1920 Table 1 class 3)



3.9 Size and Tolerance

3.9.1 *Length*: Unless be informed by "order demand letter", the length should be as shown on the following table.

Diameter (mm)	Length (mm)	Diameter (mm)	Length (mm)
Ø35	5360	Ø105	5280
Ø40	5000	Ø120	5200
Ø45	4600	Ø135	5100
Ø50	4800	Ø150	5450
Ø55	4900	Ø160	5000
Ø65	4500	Ø165	5250
Ø70	5000	Ø170	5500
Ø75	5550	Ø190	5650
Ø85	5750	Ø205	4950
Ø95	5580	Ø230	5450

3.9.2 *Tolerance*: Length and linearity ratios of material should be according to following table

Length (mm)	Tolerance (mm)
50	±0,8
100	±1,3
150	±2,0
190-350	±2,5

3.10 Mill Quality/Test Certificate

MTC should be acc.to EN10204 3.1 B and included below information:

- 3.10.1 Steel Grade
- 3.10.2 Dimension
- 3.10.3 Steel production method
- 3.10.4 Ratios of all elements in the chemical composition (According to the table).
- 3.10.5 Hardenability band
- 3.10.6 Grain size measurement.
- 3.10.7 Non-metallic inclusions.
- 3.10.8 Ultrasonic test
- 3.10.9 Delivery Hardness value.
- 3.10.10 Heat treatment information.
- 3.10.11 Forging/Reduction Ratio
- 3.10.12 Heat No
- 3.10.13 Heat Quantity



4. Pre-Acceptance

When the material is ordered, an independent AUDIT Company determined by Olimpa, will audit to follow up the production and analysis results. The manufacturer will allow this Audit Company to work in its laboratories for the necessary measurements and analyzes. After the end of the production, the compliance of the values specified in the Material Certificate in Article 3.10 with the values specified in the specification will be reported to Olimpa by the auditor. When the suitability is approved by Olimpa, the material pre-acceptance will be completed.

5. Packing and Shipping Instruction

Olimpa makes a shipment instruction after the independent auditor company notifies Olimpa about the approval of the material pre-acceptance. The following information will be stamped with cold stamp on the head of each size material

- Producer Name
- Material Grade
- Heat No
- Diameter
- Weight of steel bar

6. Inspection and Rejection

- 6.1 **Material Pre-Acceptance:** In case the conformity specified in Article 4 is not achieved, the materials will be rejected and shipment approval will not be given. The manufacturer company will inform the reasons for the non-compliance by preparing an improvement plan and will offer a solution to eliminate the nonconformity
- 6.2 **Entry Quality Control:** The entrance control of the materials is controlled according to Olimpa Material Entry Control Procedure. In case of detection of nonconformity, the materials will be rejected and returned to the manufacturer. In the event of any material-related problem in the used material during manufacturing or in the final product, Olimpa will use its return authority and demand compensation from the manufacturer for the damage caused by the error.
- 6.3 **Objection:** The producer company should immediately investigate the reasons for rejection of the material and report the detected errors to Olimpa. The rejected material should be seen and examined on site within maximum of 2 weeks.

