



TYPE OF MATERIAL	FIELD OF APPLICATION	STEEL GRADE	CHEMICAL COMPOSITION - INDICATIVE AVERAGE VALUES (%)										
			C	Mn	Si	S	Cr	Ni	Mo	V	Nb	B	
Carbon steel	Case hardening	C10	0.10	0.40	0.25								
	Hardening&Tempering	C45	0.45	0.60	0.25								
Alloy steel	Case hardening	20MnCr5	0.20	0.60	0.25		1.20						
		18NiCrMo5	0.18	0.60	0.25		0.80	0.70	0.10				
	Hardening&Tempering	30-42CrMo4	0.35	0.50	0.25		1.00		0.10				
		39NiCrMo3	0.39	0.50	0.25		0.80	0.80	0.10				
		34CrNiMo6	0.34	0.60	0.25		1.50	1.50	0.20				
		30NiCrMo12	0.30	0.60	0.25		0.80	2.80	0.40				
		40NiCrMo7	0.40	0.60	0.25		0.80	1.70	0.25				
	Creep-resistant	13CrMo4(F11)	0.13	0.40	0.60		1.20		0.50				
		X12CrMo5(F5)	0.12	0.40	0.25		5.00		0.50				
		12CrMo9.10(F22)	0.12	0.40	0.25		2.00		1.00				
X10CrMo9.1(F9)		0.10	0.40	0.50		9.00		1.00					
	X10CrMoVNb9.1(F91)	0.10	0.40	0.50		9.00		1.00	0.20	0.08			
Machinability steel	Automatic	10S20	0.10	1.00	0.03	0.200							
Microalloy steel	V	20MnV6	0.20	1.50	0.25					0.15			
	Nb	TSTE355	0.20	1.50	0.25					0.15	0.020		
	B (for case hardening)	20MnCrB5	0.20	1.20	0.25		1.20						0.0020
	B (for hardening&tempering)	30MnCrB5	0.30	1.40	0.25		0.50						0.0020
For bearings		100Cr6	1.00	0.40	0.25		1.50						
		100CrMo7	1.00	0.40	0.25		1.80		0.20				
		Sae1055	0.55	0.80	0.25								
		Sae1070	0.70	1.00	0.25								
For springs		52SiCrNi5	0.52	0.80	1.30		0.80	0.60					
		50CrV4	0.50	0.80	0.25		1.00			0.15			
		51CrMoV4	0.51	0.80	0.25		1.00		0.20	0.15			
For improved machinability		30NiCrMoS8	0.30	0.80	0.20	0.080	2.00	2.00	0.40				
For tools		Sae H13	0.38	0.40	1.00		5.00		1.30				



DELIVERY CONDITIONS		
<i>Heat treatments</i>		
Normalization	Machinability annealing	Shearability annealing
Isothermal annealing *	Hardening&Tempering	
<i>Surface conditioning</i>		
<i>BARS</i>		
Raw	Straightened	Rough-machined
Peeled	Rolled and peeled	Ground rough-machined
Ground	Chromium-plated ground	
<i>FORGINGS</i>		
Raw	Turned	Ground
Annealed	Hardened and tempered	
<i>COILS AND WIRE RODS</i>		
Raw		

* : not all range and grades



FEASIBILITY LIMITS FOR PRODUCTS WITH SURFACE FINISHING

PRODUCT TYPE	TOL.	Ra	ARROW ‰ mm/m				
	h	(μ)	h 7	h 8	h 9	h 10	h 11
PEELED (h9 up to 125 mm)	9-10-11	≤ 1.8			≤ 2	≤ 2	≤ 2
PEELED AND ROLLED	9-10-11	≤ 1.0			≤ 1	≤ 1	≤ 1
GROUND *	7-8	≤ 0.4	≤ 0.5	≤ 0.5			
ROLLED AND PEELED FOR GRINDING OR CHROMIUM-PLATING	9	≤ 1.0			≤ 0.5		
GROUND ROUGH-MACHINED	8	≤ 0.8		≤ 0.5			
CHROMIUM-PLATED GROUND *	7	≤ 0.3	≤ 0.5				

* : SHAPE ERROR < 50% OF TOLERANCE ON DIAMETER



HEAT TREATMENT FURNACES IN ABS

FURNACE NAME	TREATMENTS	FEEDING	LENGTH (mm) min. ÷ max.	SECTIONS (mm) min. ÷ max.	MAX CAPACITY (Kg)	QUENCHING	TEMPERING min. ÷ max. (°C)	OPER. TEMP. min. ÷ max. (°C)
ONA CHAMBER	TBO-TRL-TRC-TRI	GAS	length max. 52 m	r 40 ÷ 105 sq 40 ÷ 100	70,000 Kg/h	840 ÷ 880	600 ÷ 670	550 ÷ 750
ELIND	TBO-TNO	ELECTRIC	3,500 ÷ 10,000	25 ÷ 105	2,500 Kg/h	800 ÷ 1,100	550 ÷ 770	550 ÷ 1,100
SIATEM	TBO	ELECTRIC	3,500 ÷ 12,000	65 ÷ 160	3,000 Kg/h	800 ÷ 900	550 ÷ 720	550 ÷ 900
SFEAT 2-3-4	TBO	GAS	3,500 ÷ 8,000	140 ÷ 240	2,500 Kg/h	800 ÷ 940	500 ÷ 720	560 ÷ 920
OB	TRL-TRC-TRG-RINV	ELECTRIC	8,000	LUNA + REV.	30,000	air cooling		0 ÷ 850
TRUCK-HEARTH FURNACE	TRL-TRC-STB	GAS	(us 11 ÷ 11.4m) 11,500	BLOOMING	80,000	air cooling		500 ÷ 1,150
BELL FURNACE	TRI-TRL-TRC-TRG-DIS-TNO-STB	GAS	(us 10.2 ÷ 10.3m) 10,500	FORGINGS	80,000	air cooling		500 ÷ 1,150
ANNEALING FURNACE	TRL-TRC-TRG (solo per mat. Tipo Fe)	GAS	10,000	INGOTS	100,000	air cooling		500 ÷ 900
FURNACE Kt1	TBO-TNO-TRI-TRL-TRC-TRG	GAS	12,000	FORGINGS	44,000	water cooling		0 ÷ 1,100
FURNACE Kt2	TBO-TNO-TRI-TRL-TRC-TRG	GAS	12,000	FORGINGS	44,000	water cooling		0 ÷ 1,100
FURNACE Kr	TRL-TRC-TNO-RINV-STB	GAS	12,000	FORGINGS + ROLLED	88,000	air cooling		500 ÷ 800
ANNEALING PLANT	TRL-TRC-TNO-RINV-STB	GAS	13,000	LUNA + REV.	100,000	air or furnace-controlled cooling		0 ÷ 950
ELTI TUNNEL HARDENING AND TEMPERING FURNACE	TBO-TNO	GAS	4,000 ÷ 12,500	100 ÷ 300	4,000 ÷ 10,000 Kg/h	water quenching		0 ÷ 1,000



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LEGENDA: DIS= stress-relieving
 RINV= tempering
 STB= stabilization
 TBO= hardening and tempering
 TNO= normalization
 TRG= globular annealing
 TRI= isothermal annealing
 TRL= machinability annealing
 TRC= shearability annealing