

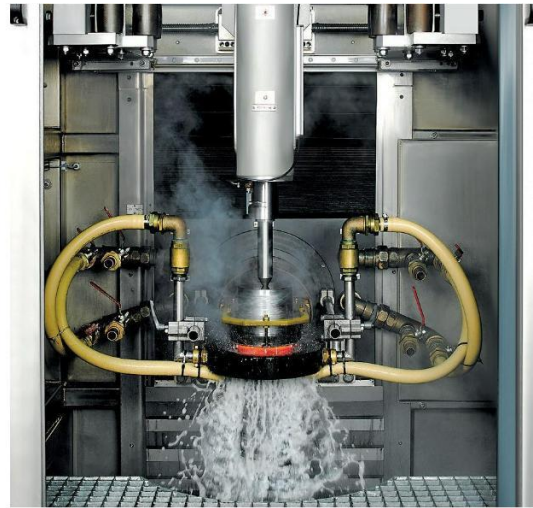
PLANT DIMENSIONS

	Diameter	Length	Width	Height
Induction hardening	Ø 600 mm	5000 mm		
Case hardening/ Carbonitriding/ tempering		900 mm	600 mm	600 mm
TENIFER Q, QP, QPQ Salt bath nitro- carburization	Ø 800 mm	1350 mm		
LTPLASOX Plasmanitrieren	Ø 1000mm	1800 mm		
LTGNCOX Gas nitrocarburising	Ø 980 mm	5000 mm		
Annealing under inert gas/ Stress-relief annealing	Ø 850 mm	5000 mm		
Vacuumhardening		900 mm	600 mm	900 mm
LTCOOL Deep-freezing -120°C		900 mm	600 mm	600 mm
Straightening 160 tonnes	Ø 250 mm	6000 mm		
Vibratory grinding	Ø 50 mm	250 mm		
Sandblasting/ Ceramic bead blasting	Ø 1200 mm			1000 mm

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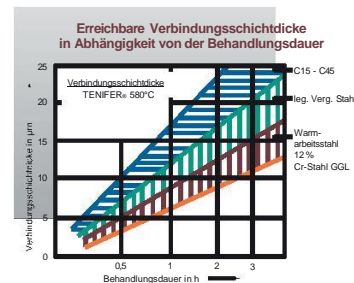
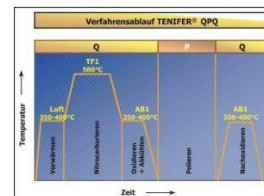
HARDENING / NITRIDING / NITROCARBURISING



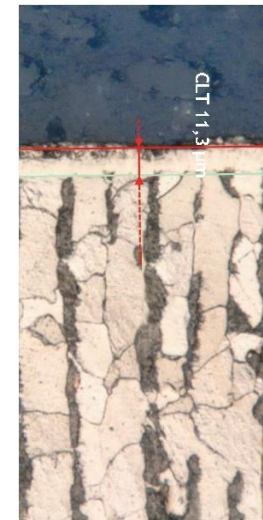
Induction hardening



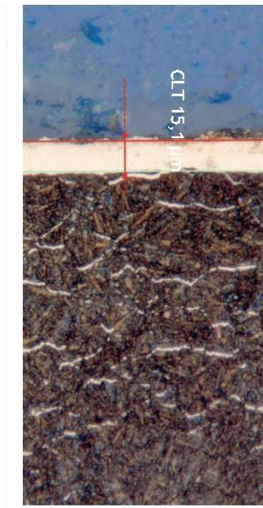
Salt bath nitrocarburising
Tenifer Q-QP-QPQ



METALLOGRAPHIC ANALYSES



Micrograph: 1.0570, S355J2G3,
TENIFER QPQ 90 min., NHD: 0.60



Micrograph: 1.6582, 34CrNiMo6+QT,
LTGNCOX, NHD: 0.35

10,0



Digital microscopy, optical measurements

Guide
Heat treatment

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Material groups	Standard designation	Vacuum hardening	Induction hardening	hardening, tempering, carbonitriding	Gas nitrocarburising - LTGNCOX			Salt bath nitrocarburising - TENIFER			Micropulse plasma nitriding - PLASOX		
		Surface hardness in HRC	Surface hardness in HRC		Surface hardness Up to 64 HRC	Surface hardness HV1	Max. nitriding hardness depth in mm	Compound layer thickness CLT in µm	Surface hardness HV1	Nitriding hardness depth in mm	Compound layer thickness CLT in µm	Surfaces hardness HV1	Nitriding hardness depth in mm
STRUCTURAL STEELS													
1.0037	S235JR	–	–	yes	280-400	0,30-0,60	5-20	280-400	0,30-0,60	5-20	280-400	0,30-0,60	5-20
1.0570	S355J2G3	–	–	yes	300-450	0,30-0,60	5-20	300-450	0,30-0,60	5-20	300-450	0,30-0,60	5-20
QUENCHED UND TEMPERED STEELS													
1.1181	C35E	–	50-54	due	300-500	0,30-0,60	5-20	300-500	0,30-0,60	5-20	300-500	0,30-0,60	5-20
1.1191	C45E	–	55-60	due	300-500	0,30-0,60	5-20	300-500	0,30-0,60	5-20	300-500	0,30-0,60	5-20
1.1221	C60E	–	58-64	–	300-500	0,30-0,60	5-20	300-500	0,30-0,60	5-20	300-500	0,30-0,60	5-20
1.6580	30CrNiMo8	–	50-55	due	600-800	0,20-0,50	5-20	600-800	0,20-0,50	5-20	600-800	0,20-0,50	5-20
1.6582	34CrNiMo6	–	51-56	due	600-800	0,20-0,50	5-20	600-800	0,20-0,50	5-20	600-800	0,20-0,50	5-20
1.7033	34Cr4	–	51-57	due	500-600	0,20-0,50	5-20	500-600	0,20-0,50	5-20	500-600	0,20-0,50	5-20
1.7220	34CrMo4	–	52-57	due	500-600	0,20-0,50	5-20	500-600	0,20-0,50	5-20	500-600	0,20-0,50	5-20
1.7225	42CrMo4	–	54-60	due	550-750	0,20-0,50	5-20	550-750	0,20-0,50	5-20	550-750	0,20-0,50	5-20
1.8159	51CrV4	–	57-62	–	550-700	0,20-0,50	5-20	550-700	0,20-0,50	5-20	550-700	0,20-0,50	5-20
1.8161	58CrV4	–	58-64	–	550-700	0,20-0,50	5-20	550-700	0,20-0,50	5-20	550-700	0,20-0,50	5-20
NITRIDING STEELS													
1.8519	31CrMoV9	–	–	–	750-900	0,20-0,50	5-20	750-900	0,20-0,50	5-20	750-900	0,20-0,50	5-20
1.8550	34CrAlNi7-10	–	–	–	850-1100	0,20-0,50	5-20	850-1100	0,20-0,50	5-20	850-1100	0,20-0,50	5-20
CASE-HARDENING STEELS													
1.0401	C15	–	–	yes	300-450	0,20-0,50	5-20	300-450	0,20-0,50	5-20	300-450	0,20-0,50	5-20
1.2162	21MnCr5	–	–	yes	600-800	0,20-0,50	5-20	600-800	0,20-0,50	5-20	600-800	0,20-0,50	5-20
1.6587	18CrNiMo7-6	–	–	yes	600-700	0,20-0,50	5-20	600-700	0,20-0,50	5-20	600-700	0,20-0,50	5-20
1.7131 / 1.7139	16MnCr5	–	–	yes	600-750	0,20-0,50	5-20	600-750	0,20-0,50	5-20	600-750	0,20-0,50	5-20
1.7147	20MnCr5	–	–	yes	600-700	0,20-0,50	5-20	600-700	0,20-0,50	5-20	600-700	0,20-0,50	5-20
BALL BEARING STEELS													
1.2510	100MnCrW4	–	61-66	–	500-700	0,10-0,30	5-20	500-700	0,10-0,30	5-20	500-700	0,10-0,30	5-20
1.3505	100Cr6	–	61-66	–	450-700	0,10-0,30	5-20	450-700	0,10-0,30	5-20	450-700	0,10-0,30	5-20
COLD WORK STEELS													
1.2083	X42Cr13	bis 58	–	–	–	–	–	850-1150 *	0,10-0,20	5-20	850-1150 *	0,10-0,20	5-20
1.2312	40CrMnMoS8-6	bis 52	50-55	–	650-800	0,10-0,30	5-20	650-800	0,10-0,30	5-20	650-800	0,10-0,30	5-20
1.2363	X100CrMoV5-1	bis 63	60-65	–	–	–	–	950-1200 *	0,10-0,20	5-20	950-1200 *	0,10-0,20	5-20
1.2379	X155CrVMo12-1	bis 63	–	–	–	–	–	900-1200 *	0,10-0,20	5-20	900-1200 *	0,10-0,20	5-20
WARM WORK STEELS													
1.2343	X38CrMoV5-1	bis 54	52-58	–	–	–	–	850-1150 *	0,15-0,40	5-20	850-1150 *	0,15-0,40	5-20
1.2344	X40CrMoV5-1	bis 54	53-58	–	–	–	–	850-1150 *	0,15-0,40	5-20	850-1150 *	0,15-0,40	5-20
1.2365	X32CrMoV3-3	bis 52	55-60	–	–	–	–	700-900 *	0,15-0,40	5-20	700-900 *	0,15-0,40	5-20
STAINLESS STEELS													
1.4021	X20Cr13	bis 50	48-52	–	–	–	–	850-1200 *	0,10-0,20	3-15	850-1200 *	0,10-0,20	3-15
1.4034	X46Cr13	bis 54	52-58	–	–	–	–	850-1200 *	0,10-0,20	3-15	850-1200 *	0,10-0,20	3-15
1.4112	X90CrMoV18	bis 60	50-55	–	–	–	–	900-1150 *	0,10-0,20	3-15	900-1150 *	0,10-0,20	3-15
1.4122	X39CrMo17-1	bis 49	42-46	–	–	–	–	900-1150 *	0,10-0,20	3-15	900-1150 *	0,10-0,20	3-15
1.4571	X6CrNiMoTi17-12-2	–	–	–	–	–	–	900-1150 *	0,10-0,20	3-15	900-1150 *	0,10-0,20	3-15
CAST MATERIALS													
EN-JS 1030	EN-GJS 400-15	–	–	–	–	–	–	400-600	0,20-0,50	5-20	400-600	0,20-0,50	5-20
EN-JS 1060	EN-GJS 600-3	–	–	–	–	–	–	450-650	0,20-0,50	5-20	450-650	0,20-0,50	5-20

All figures are for guidance only, major fluctuations are possible. Please do not hesitate to contact us for further information.

* Nitriding reduces corrosion resistance