

Designation	Leaded Steel ~C100+Pb	DIN	EN Nr.	UNS (ASTM)	AISI	LMSA
		-	-	-	-	C320

### Chemical composition (Weight %)

Fe	C	Si	Mn	P	S	Pb	S	Cr	Ni	Cu
Remainder	0.90-1.05	0.15-0.25	0.20-0.50	<0.10	<0.10	0.15-0.30	<0.10	≤ 0.10	≤ 0.10	≤ 0.10

In order to achieve maximum homogeneity and consistent quality, the actual tolerances on both alloy components and impurities, are significantly tighter and more precisely defined than the standard analysis indicated.

### Main Technological Properties

This unalloyed construction steel with lead addition (HT10 ~ steel C100 + Pb ) is frequently used in the watch industry. Steel HT10 has an excellent ability for cold forming, cutting, milling and drilling. Its tensile strength can be significantly increased by quench hardening and tempering.

With its fine microstructure, it is suitable for use in many applications where precision is required. Lamineries Matthey SA produces thin HT10 strip with tight tolerances allowing stamping of extremely complex parts the finishing of which before or after quenching and tempering can include additional operations such as cutting, milling or drilling. In contrast to its ease in machining, its polishing ability is poor due to the its Pb content.

### Typical manufacturing range

		Thickness (mm)	Width (mm)	Length (mm)
<b>Rolled products</b>	Strips in coils <sup>1)</sup>	0.005 - 1.000	1.5 - 210.0	-
	Strips, sheets in <sup>1)</sup>	0.005 – 1.500	10.0 - 210.0	100 - 3000

1) All our production possibilities are not presented here. Other dimensions or other product forms upon request. Certain combinations of thicknesses and widths are not possible.

### Mechanical strip properties

Temper	R <sub>p0.2</sub> (N/mm <sup>2</sup> )	R <sub>m</sub> (N/mm <sup>2</sup> )	A <sub>50</sub> (%)	HV
Annealed		500-620		145-175
¼ hard		600-680		170-210
½ hard		660-750		210-240
¾ hard		730-850		220-270
Hard		830-950		250-300
Extra hard		930-1050		> 290

### Typical uses

The excellent machinability and drawing properties of HT11 steel combined with its high hardness after quench hardening and tempering make it particularly suitable for manufacturing of watch components and other complex applications.

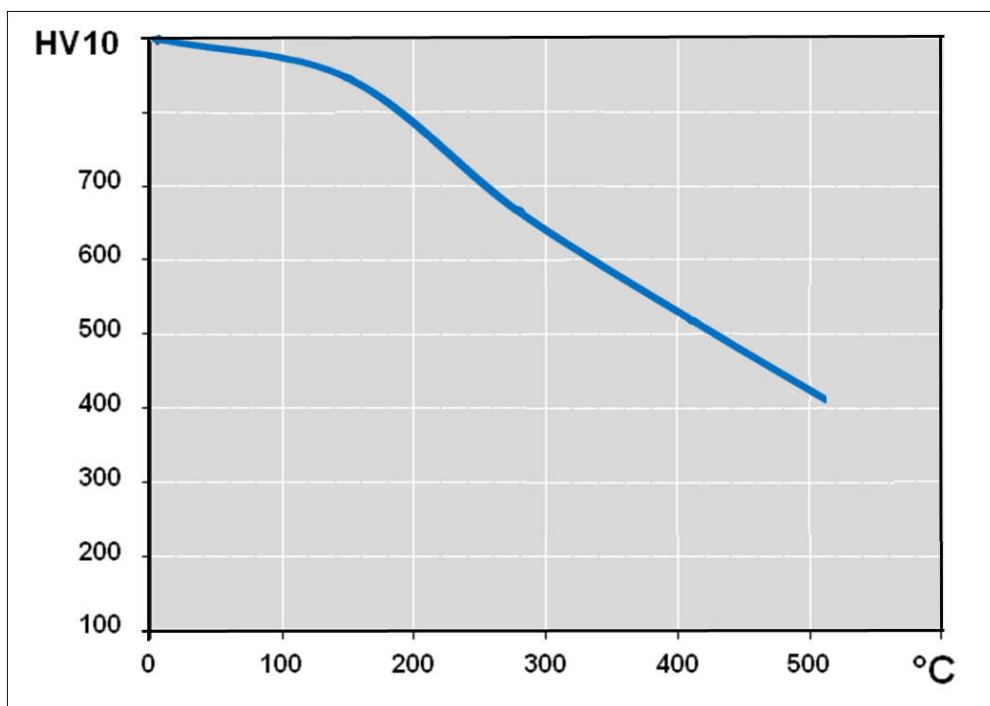
The information in this document is informative only. Information provided does not constitute any contractual commitment or warranty of any kind.

Designation	Leaded Steel ~C100+Pb	DIN	EN Nr.	UNS (ASTM)	AISI	LMSA
		-	-	-	-	C320

### Parts heat treatment

#### Quenching and tempering:

Oil quenching : 780-810°C / 20 to 30 min followed by quenching in oil. The tempering temperature between 150-500 °C/3h allows to adjust the requested hardness.

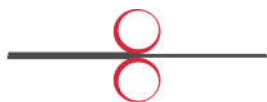


800°/30min + oil quenching  
Hardness after 3h tempering at different temperatures.

### Physical properties

Modulus of elasticity	kN/mm <sup>2</sup>	200
Poisson ratio		0.28-0.30
Density	kg/dm <sup>3</sup>	~7.8
Melting temperature	°C	1430-1510
Linear dilatation coefficient	10 <sup>-6</sup> / °C	11.4
Thermal conductivity at 20°C	W/m °K	50
Electrical resistivity	μΩcm	16
Electrical conductivity	MS/m	11
Electrical conductivity	% IACS	6.3
Specific heat (25°C)	J/(g.K)	500
Magnetic properties		700-1100~

The information in this document is informative only. Information provided does not constitute any contractual commitment or warranty of any kind.



Designation	Leaded Steel ~C100+Pb	DIN	EN Nr.	UNS (ASTM)	AISI	LMSA
		-	-	-	-	C320

### Tolerances

Thickness	Thickness (mm)		EN Standard		Lamineries MATTHEY SA		
	≥	<	10140 Precision	10258 Precision	LMSA Standard	LMSA Precision	LMSA Extreme
<p>The table shown is an outline of our typical thickness tolerances available, which are tighter than industry standards.</p> <p>Upon request: our "LMSA Precision" and "LMSA Extreme" tolerances are also available.</p>		0.025	-	-	-	-	± 0.001
	0.025	0.050	-	-	± 0.003	± 0.002	± 0.0015
	0.050	0.065	-	± 0.003	± 0.003	± 0.0025	± 0.002
	0.065	0.100	-	± 0.004	± 0.004	± 0.0035	± 0.003
	0.100	0.125	± 0.005	± 0.006	± 0.005	± 0.004	± 0.003
	0.125	0.150	± 0.005	± 0.006	± 0.005	± 0.005	± 0.004
	0.150	0.250	± 0.010	± 0.008	± 0.008	± 0.006	± 0.004
	0.250	0.300	± 0.010	± 0.009	± 0.009	± 0.007	± 0.005
	0.300	0.400	± 0.010	± 0.010	± 0.010	± 0.007	± 0.005
	0.400	0.500	± 0.015	± 0.012	± 0.012	± 0.008	± 0.006
	0.500	0.600	± 0.015	± 0.014	± 0.014	± 0.010	± 0.007
	0.600	0.800	± 0.015	± 0.015	± 0.015	± 0.010	± 0.007
	0.800	1.000	± 0.015	± 0.018	± 0.018	± 0.012	± 0.009
	1.000	1.200	± 0.020	± 0.020	± 0.020	± 0.015	± 0.012
	1.200	1.250	± 0.020	± 0.020	± 0.020	± 0.015	± 0.012
1.25	1.500	± 0.020	± 0.020	± 0.020	± 0.015	± 0.014	

### Width

Our width tolerance is + 0.2 -0.0 mm (or ± 0.1 mm upon request). They are available for slit widths < 125 mm and thicknesses < 1.00 mm. Special tolerances upon request.

### Camber

	Width (mm)		Camber max. (mm/m)			
	>	≤	LMSA standard		LMSA extreme	
			≤ 0.5 mm	> 0.5 mm	≤ 0.5 mm	> 0.5 mm
<p>Our tolerance "standard" respects the EN Standard 1654 (Length of measurement 1000 mm).</p> <p>Other tolerances upon request.</p>	3	6	12	-	6	-
	6	10	8	10	4	5
	10	20	4	6	2	3
	20	250	2	3	1	1.5

### Surface

Special surface qualities upon request

### Flatness

Special requirement on the longitudinal or transversal flatness upon request

The information in this document is informative only. Information provided does not constitute any contractual commitment or warranty of any kind.