

<b>Quality</b>	<b>HS 10-4-3-10</b>	Supply conditions:	<i>Technical card</i>
According to standard	<b>UNI EN ISO 4957: 2002</b>	Annealed HB max 302	<b>Lucefin Group</b>
Number	<b>1.3207</b>		rev. 2018

### Chemical composition

C%	Si%	Mn%	P%	S%	Cr%	Mo%	V%	W%	Co%
	max	max	max	max					
1,20-1,35	0,45	0,40	0,030	0,030	3,80-4,50	3,20-3,90	3,00-3,50	9,00-10,00	9,50-10,50
± 0.03	+ 0.03	+0.04	+ 0.005	+ 0.005	± 0.10	± 0.10	± 0.10	± 0.10	± 0.15

Product deviations are allowed

### Temperature °C

Hot-forming	Stress-relieving after machining and before quenching	Pre-heating	Quenching +Q heatings must be carried out in controlled atmosphere furnace	Tempering +T	
1100-900	600-650 furnace cooling	450, pause, then 860, pause, then 1050, pause, then ▲	▲ 1210-1240 oil, polymer, forced air or salt bath (500-550)	550-570 calm air minimum 2 cycles	
Soft annealing +A	Isothermal annealing +I	Pre-heating welding		Stress-relieving after welding	
770-840 cooling max 22 °C/h in air (HB max 302)	-	All high-speed steels must be annealed after hot-forming		not recommended	
		<b>Ac1</b>	<b>Ac3</b>	<b>Ms</b>	<b>Mf</b>
		830	870	160	-55 subcooling

Hardness in annealed and **cold-drawn** state can be max HB 352. Hardness in annealed and **cold-rolled** condition can be HB 372

The symbol ▲ indicates temperature rise up to .....°C ▲

### Mechanical properties

Table of tempering values obtained at room temperature on round of Ø 15 mm after quenching at 1230 °C in oil

<b>HB</b>	722	722	714	706	688	679	688	706	739	758	758	739	688	560
<b>HRC</b>	64	64	63.5	63	62	61.5	62	63	65	66	66	65	62	55
<b>R N/mm<sup>2</sup></b>	-	-	-	-	-	-	-	-	-	-	-	-	-	2070
Tempering at °C	<b>50</b>	<b>100</b>	<b>150</b>	<b>200</b>	<b>250</b>	<b>300</b>	<b>350</b>	<b>400</b>	<b>450</b>	<b>500</b>	<b>550</b>	<b>600</b>	<b>650</b>	<b>700</b>
<b>Thermal Expansion</b>	10 <sup>-6</sup> • K <sup>-1</sup>			►	9.6	10.0	10.1	10.3	10.5	10.7	10.7			
<b>Modulus of Elasticity long.</b>	GPa			217										
<b>Modulus of Elasticity tang.</b>	GPa			83										
<b>Specific Heat Capacity</b>	J/(Kg•K)			460										
<b>Thermal Conductivity</b>	W/(m•K)			19.0										
<b>Density</b>	Kg/dm <sup>3</sup>			8.30										
<b>Specific Electric Resist.</b>	Ohm•mm <sup>2</sup> /m			0.80										
<b>Electrical Conductivity</b>	Siemens•m/mm <sup>2</sup>			1.25										
°C					<b>20</b>	<b>100</b>	<b>200</b>	<b>300</b>	<b>400</b>	<b>500</b>	<b>600</b>	<b>700</b>		

The symbol ► indicates temperature between 20 °C and 100 °C, 20 °C and 200 °C ...

### Suggested cutting parameters *carbide insert*

Annealed hot-rolled	0,5 / 1	1 / 4	4 / 8	<i>ap</i> depth of cut mm
	0.2 / 0.3	0.2 / 0.4	0.3 / 0.6	<i>fn</i> feed mm/rev
	210 / 150	160 / 110	110 / 80	<i>Vc</i> cutting speed m/min

EUROPE	ITALY	CHINA	GERMANY	FRANCE	U.K.	RUSSIA	USA
EN	UNI	GB	DIN	AFNOR	B.S.	GOST	AISI/SAE
HS 10-4-3-10	HS 10-4-3-10		HS 10-4-3-10	Z130WKCDV 10.10.04.04.03	BT42	R12F3K10M3-SCh	