

# Labor Pb

## Free Cutting High Carbon Steel

### Distinctive feature & main attribute

A hardenable, unalloyed free cutting high carbon steel, with lead and sulphur, and a good metallurgical microstructure, showing an excellent machinability.

### Use & application range

This material is particularly designed for the production of small high precision parts in the automotive, watch and micro-motor industries.

### Material No. and norms

Material No.	1.0759
DIN Abbreviation	~ 70SPb20
AFNOR	
AISI/SAE/ASTM	AISI ~ 1065 (+S) / AISI ~ 1075
ISO	
Euro Standard EN	
IMDS	4472215

### Reference analysis %

C	Si	Mn	P	S	PB	Fe
0.65	max.	0.70	max.	0.15	0.15	balance
0.75	0.20	1.00	0.04	0.25	0.25	

### Execution, delivery form, standard sizes and availability

- Execution in 3 m (2 m) round bars as well as coils
- ROHS compliant
- Standard size in stock: [see Product range](#)
- Other sizes on request

### Tolerances

- $\varnothing < 2.00$  mm, cold drawn, polished; ISO h8
- $\varnothing \geq 2.00$  mm, cold drawn, ground, polished; ISO h7
- Coil, drawn; ISO fg7 (fg8)
- Tighter tolerances (up to +/- 0.001 mm) on request
- Surface finish for bars  $\leq 0.4$  (N5)
- Bar straightness max. 0.4 mm/m

### Mechanical properties

At delivery status:

- Bars: Tensile strength (Rm):
 

$\varnothing$ 0.60 – 3.49	725 – 900 MPa
$\varnothing$ 3.50 – 6.00	625 – 775 MPa
$\varnothing$ 6.01 – 12.00	555 – 725 MPa
- Coils: Tensile strength (Rm):
 

$\varnothing \leq 3.50$	775 – 925 MPa
$\varnothing$ 3.51 – 10.00	625 – 775 MPa
- Hardness after tempering: 61-63 HRC

### Crack detection bars

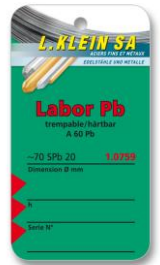
Eddy-current crack tested  
 •  $\varnothing \geq 2.00$  mm  
 DIN/EN 10277-1: detected depth error < 0.1mm  
 Class 4

### Heat treatment

- Tempering oil  $\varnothing < 5.00$  mm: 810 – 830°C
- Tempering water  $\varnothing > 5.00$  mm: 790 – 810°C
- Soft annealing: 660 – 700°C, to achieve Rm ~ 600 MPa/mm<sup>2</sup>
- Annealing as required see charts

### Cutting rates

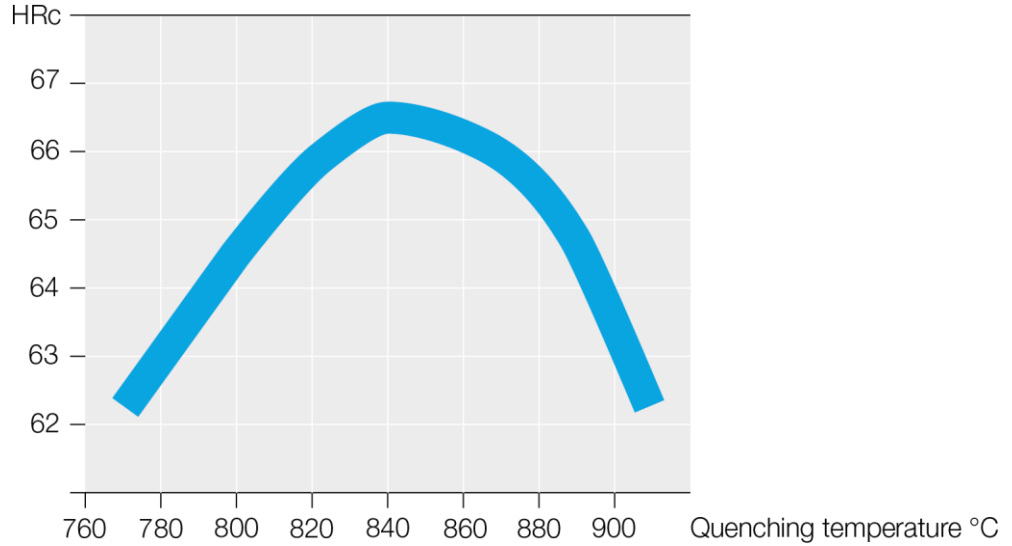
vc ~ 50 – 70 m/min, value depending on the lubrication oil, cutting tools and shape of parts.



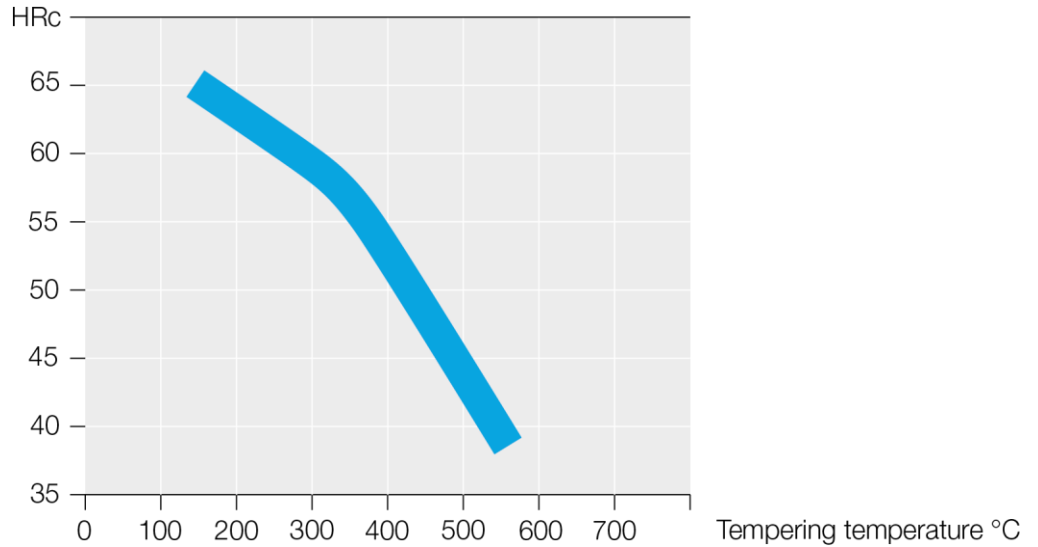
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### HARDENING CURVE



### ANNEALING CURVE 30 minutes



When hardening in oil, we recommend not passing over the annealing temperature of 820°C in order to avoid cracks. The water should be pre-heated to about 50°C. The above curves are limited to sizes of approximately 5 mm. The result after heat treatment can be slightly different than shown on this curves, depending on the shape and size of the part.