

## 1.2162

<b>Material no.:</b>	1.2162				
<b>Abbreviated DIN name:</b>	21 MnCr 5				
<b>Chemical analysis (%):</b>	C	Mn	Cr		
	0,21	1,3	1,2		

<b>HASCO colour code:</b>	yellow
Flat steel:	grey
<b>Hardness when supplied:</b>	annealed to max. 210 HB (~ 710 N/mm <sup>2</sup> )

### Characteristics

#### Material properties:

Standard steel with good machinability. After suitable heat treatment, high surface hardness with good wear resistance and tough core.

**Uses:** Cavity plates and inserts for plastics processing. Frame plates for compression moulds and injection moulding tools subjected to high stresses. Tool components subjected to high wear because of the particular function. Other components in which surface hardness and core strength are specified.

### Remarks

<b>Polishing:</b>	Technical polishing is possible.
<b>Graining:</b>	Possible.
<b>Nitriding:</b>	Not usual because the hardness declines considerably. Hardened workpieces from these steel types are not nitrided.
<b>Hardening:</b>	810°C – 840°C Details can be taken from the time-temperature conversion and tempering charts. The most suitable heat treatment for the relevant workpiece should be fixed by the hardening shop. The hardness should be specified by the hardening shop and checked on delivery.
<b>Soft annealing:</b>	690°C, approx. 4 h
<b>Stress-relief annealing:</b>	To eliminate residual stress after coarse machining at approx. 600°C – 650°C, approx. 4 h with slow heating and furnace cooling.
<b>Normal working hardness:</b>	Surface hardness 58 - 61 HRC, core strength 1000 - 1200 N/mm <sup>2</sup>

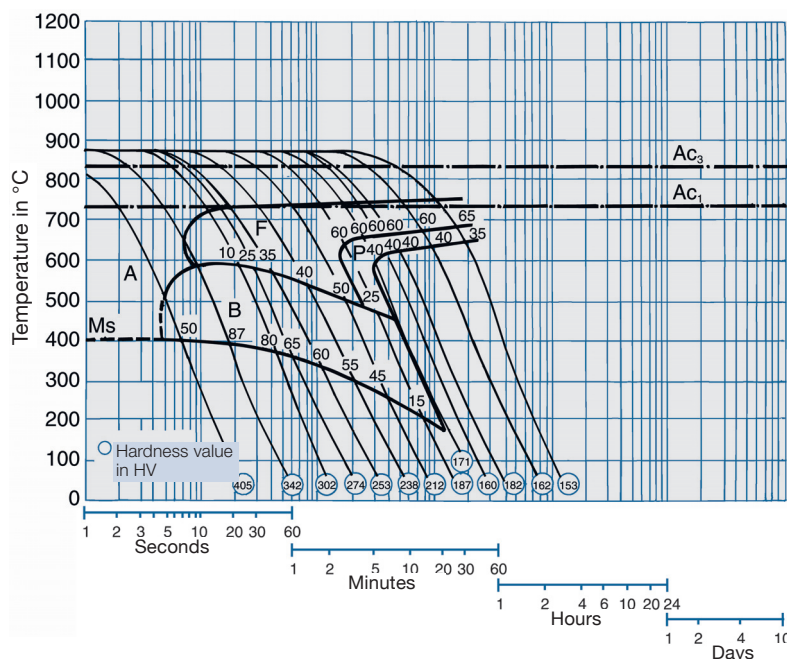
### Physical properties

#### Thermal expansion coefficient (10<sup>-6</sup>·m)/(m·K)

100	200	300	400	500	600	700	°C
12,2	12,9	13,5	13,9	14,2	14,5	14,8	

<b>Thermal conductivity</b>	20	350	700	°C
	39,5	36,5	33,5	

### Time-temperature conversion chart



### Tempering chart

