

## ES 100 K

**Name:**

**21 MnCr 5**

**Material No.:**

1.2162

**Typical analysis in %:**

	C	Mn	Cr
	0.21	1.3	1.2

**As-supplied condition:**

BG-annealed to maximum 210 HB (approx. 710 N/mm<sup>2</sup>)

**Characteristics:**

Standard case hardening steel, easily machined, good polishability, suitable for cold hobbing, high surface hardness with high core toughness can be achieved with appropriate heat treatment

**General fields of application:**

Tools for plastic processing (thermoplastic and thermosetting), pinions, gear wheels, gear racks, shafts etc.

**Special note:**

Case hardening in powder at: 870 - 900 °C

Case hardening in salt bath: 900 - 930 °C

Intermediate annealing temperature: 630 - 650 °C

**Heat treatment data:**

	Temperature	Duration	Cooling
Soft annealing	670 - 710 °C	2 - 5 h	furnace
Stress-relief annealing	600 - 650 °C	min. 4 h	furnace
Hardening	810 - 840 °C	Group II	oil, WB 200 °C
Tempering	180 - 300 °C see tempering curve	min. 2 h depending on cross section	still air

**Physical characteristics:**

**Coefficient of thermal expansion:** between 20 °C and:

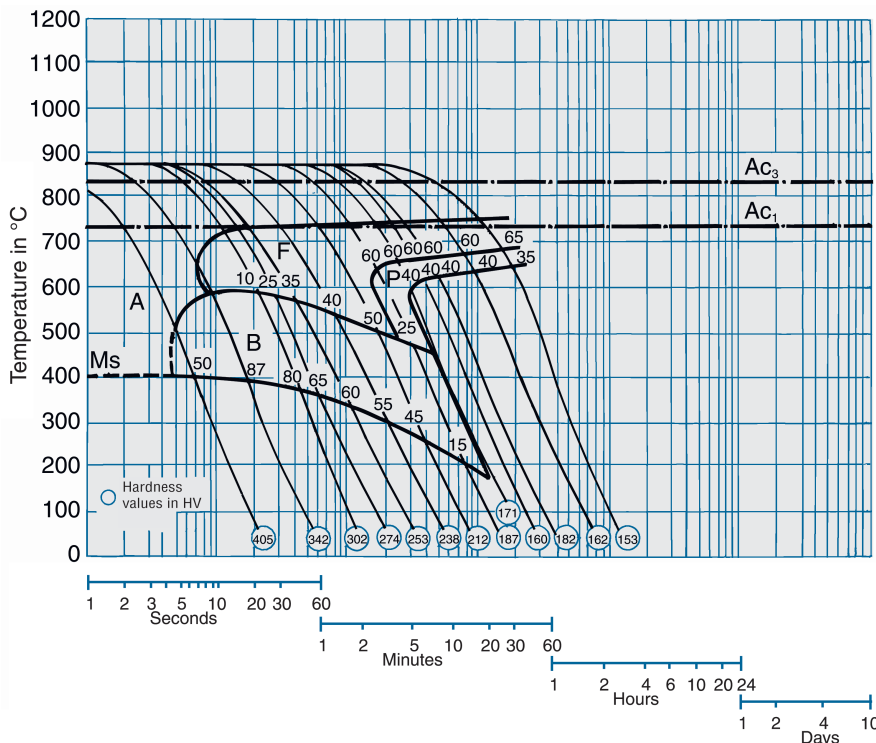
10 <sup>-6</sup> x m	100	200	300	400	500	600	700 °C
m x K	12.2	12.9	13.5	13.9	14.2	14.5	14.8

**Thermal conductivity:**

W	20	350	700 °C
m x K	39.5	36.5	33.5

**Normal working hardness:** 58 - 61 HRC (after hardening, core strength approx. 1000 - 1200 N/mm<sup>2</sup>)

**Continuous time-temperature-transformation diagram**



**Tempering curve**

