

## ES 106 K

**Name:**

**X 19 NiCrMo 4**

**Material No.:**

1.2764

**Typical analysis in %:**

	C	Cr	Mo	Ni
	0.19	1.3	0.3	4.1

**As-supplied condition:**

Soft-annealed to max. 255 HB (855 N/mm<sup>2</sup>)

**Characteristics:**

Very tough, air hardening case hardening steel, low dimensional change, excellent polishability, very high core strength of up to 1500 N/mm<sup>2</sup>

**General fields of application:**

Moulds for plastics processing involving deep and complicated impressions

**Special note:**

Case hardening temperature in powder: 850 - 880 °C

In salt bath: 880 - 930 °C

Intermediate annealing temperature: 600 - 650 °C

Core strength after oil or

WB hardening: 1200 - 1500 N/mm<sup>2</sup>

After air or compressed air hardening: 1100 - 1300 N/mm<sup>2</sup>

After hardening in case hardening box: 900 - 1100 N/mm<sup>2</sup>

Surface hardness after oil hardening: approx. 60 HRC

After air hardening: approx. 55 - 60 HRC

**Heat treatment data:**

	Temperature	Duration	Cooling
Soft annealing	620 - 650 °C	2 - 5 h	furnace
Stress-relief annealing	600 - 650 °C	min. 4 h	furnace
Hardening	780 - 810 °C	Group II	oil,
	800 - 830 °C		air
Tempering	180 - 300 °C	min. 2 h	still air
	see tempering curve	depending on cross section	

**Physical characteristics:**

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

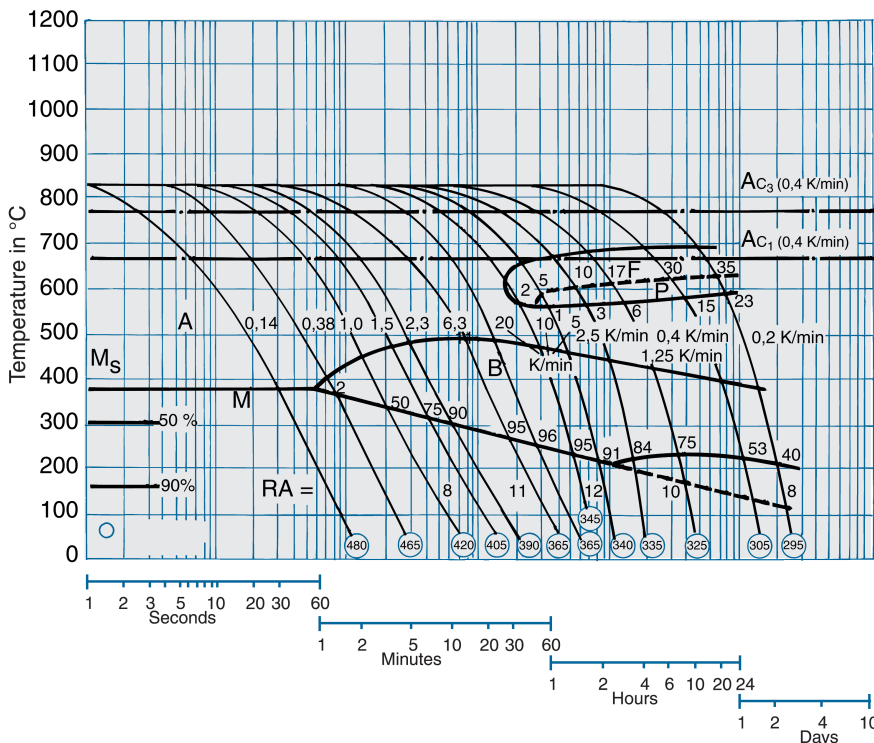
10 <sup>-6</sup> x m	100	200	300	400 °C
m x K	12.2	13.0	12.1	13.5

**Thermal conductivity:**

W	20	350	700 °C
m x K	33.5	32.2	32.0

**Normal working hardness:** 50 - 60 HRC

**Continuous time-temperature-transformation diagram**



**Tempering curve**

