

## ES ULW 65

Name:

**C 45 U**

Material No.:

1.1730

Typical analysis in %:

C Si Mn

0.45 0.3 0.7

As-supplied condition:

Annealed to a hardness of about 190 HB (approx. 650 N/mm<sup>2</sup>)

Characteristics:

Unalloyed tool steel, good machinability, shallow depth case hardening steel

General fields of application:

Mould frames, components for plastic moulds, blow and foaming moulds with low polishability requirements, unhardened components in moulds, tools, jigs and fixtures

Special note:

Shallow depth case hardening steel

### Heat treatment data:

	Temperature	Duration	Cooling
Soft annealing	680 - 710 °C	2 - 5 h	furnace
Stress-relief annealing	600 - 650 °C	min. 4 h	furnace
Hardening	800 - 830 °C	Group I	water, oil
Tempering	160 - 300 °C see tempering curve	min. 2 h depending on cross section	still air

Through-hardening diameter:  
15 mm (water)

Hardening depth for  $\square$  30 mm:  
3.5 mm

### Physical characteristics:

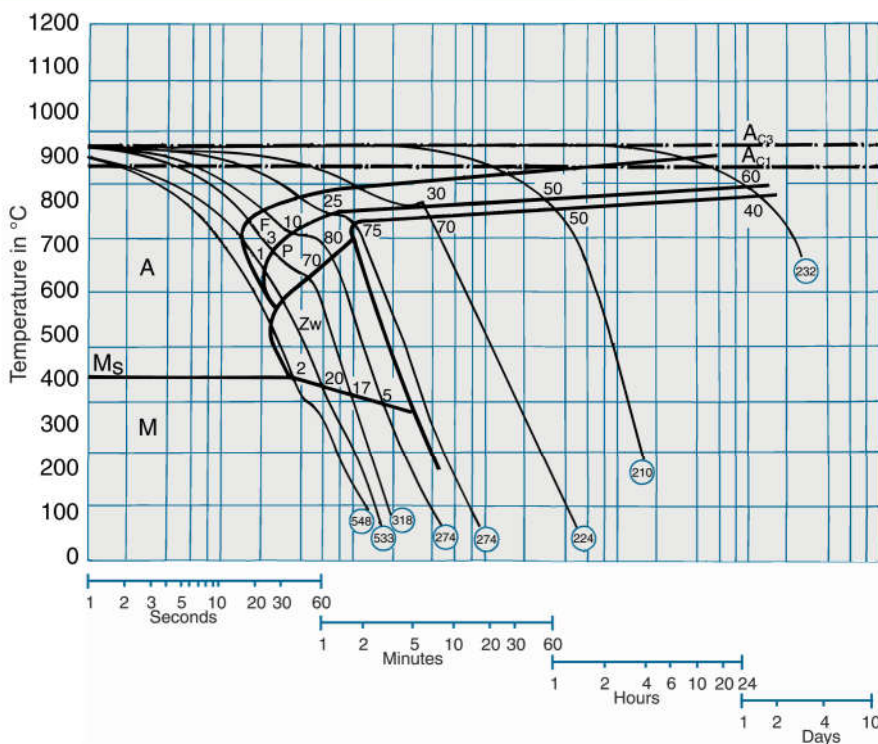
Coefficient of thermal expansion: between 20 °C and:

$10^{-6} \times m$	100	200	300	400	500	600 °C
m x K	11.0	12.0	13.0	13.5	14.0	14.2

Thermal conductivity:  $\frac{W}{m \times K}$   $\frac{20 \text{ °C}}{50}$

Normal working hardness: 650 N/mm<sup>2</sup>, generally used in the as-supplied condition

### Continuous time-temperature-transformation diagram



### Tempering curve

