

# Thermodur 2367 EFS / 2367 EFS Superclean

~X38CrMoV5-3

C 0.37 Cr 5.00 Mo 3.00 V 0.60

## Steel properties

Excellent high-temperature strength and tempering resistance, good hardenability, minimal warpage.

## Physical properties

### Coefficient of thermal expansion

at °C	20 – 100	20 – 200	20 – 300	20 – 400	20 – 500	20 – 600	20 – 700
$10^{-6} \text{ m}/(\text{m} \cdot \text{K})$	11.9	12.5	12.6	12.8	13.1	13.3	13.5

### Thermal conductivity

at °C	20	350	700
$\text{W}/(\text{m} \cdot \text{K})$ Annealed	30.8	33.5	35.1
$\text{W}/(\text{m} \cdot \text{K})$ Quenched and tempered	29.8	33.9	35.3

## Applications

Forging dies, die casting dies, die holders, extrusion dies for heavy metals, inner liner for light metals, profiling dies, and mandrels.

**For your most challenging requirements, we recommend Thermodur 2367 EFS Superclean (ESR).**

## Heat treatment

**Soft annealing °C**  
730 – 780

**Cooling**  
Furnace

**Hardness HB**  
max. 235

**Hardening °C**  
1020 – 1050

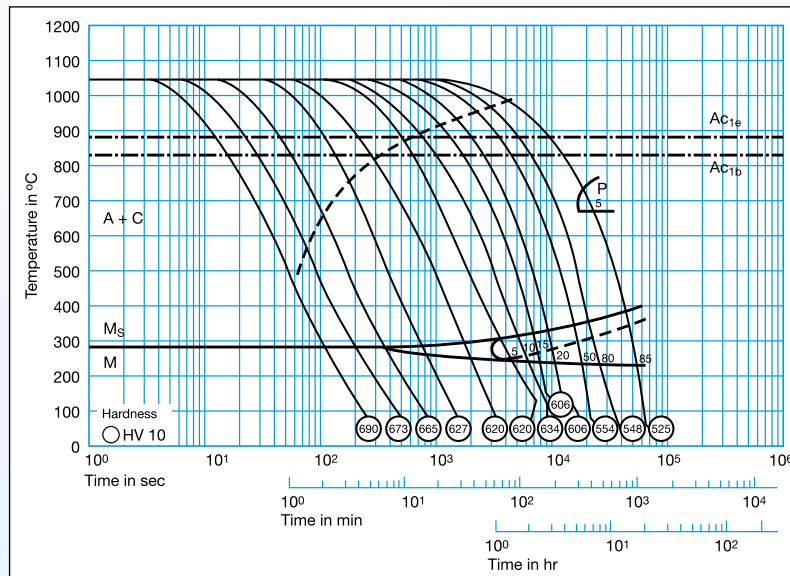
**Quenching**  
Air, oil or  
hot bath, 500 – 550 °C

**Hardness after quenching HRC**  
57

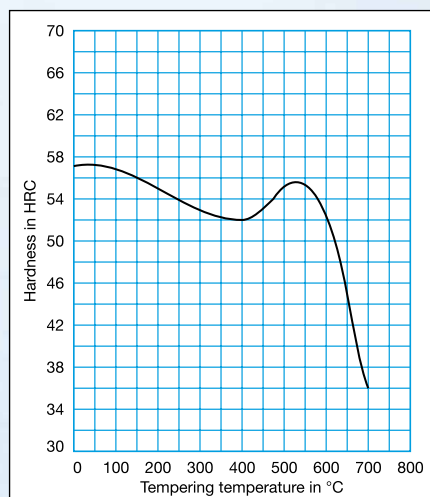
**Tempering °C**  
**HRC**

100	200	300	400	500	550	600	650	700
57	55	53	52	55	55	52	45	36

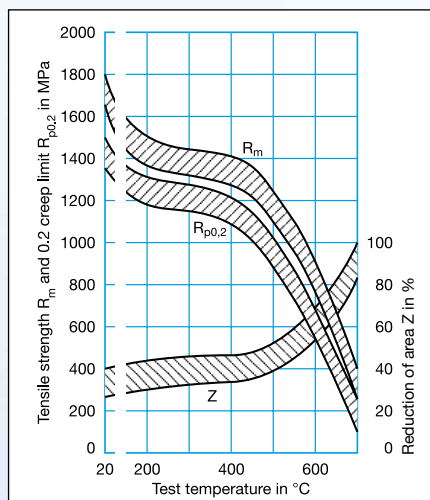
## Time-temperature-transformation diagram



## Tempering diagram



High-temperature strength diagram



Creep behavior

