

## MATERIAL NO.:

1.2344 / 1.2344 ESR\*

### DESIGNATION:

**DIN:** X 40 CrMoV 5-1  
**AFNOR:** Z 40 CDV 5  
**UNI:** X 40 CrMoV 5-1 KU  
**AISI:** H13 / H13 ESR

### TECHNICAL TIP:

- » Susceptible to corrosion; during machining, continuous corrosion protection has to be ensured (especially during wire EDM)
- » **1.2344 ESR** is highly suitable for mirror polishing

### INDICATORY ANALYSIS:

C 0.40  
 Si 1.00  
 Mn 0.40  
 S 0.03 (ESR 0.002)  
 Cr 5.30  
 Mo 1.40  
 V 1.00

### STRENGTH:

max. 230 HB  
 (≈ max. 780 N/mm<sup>2</sup>)

### THERMAL CONDUCTIVITY AT 100 °C:

26  $\frac{W}{m K}$

### COEFFICIENT OF THERMAL EXPANSION [10<sup>-6</sup>/K]

100 °C	200 °C	300 °C	400 °C	500 °C	600 °C	700 °C
11.0	11.6	12.2	12.6	13.4	13.6	13.7

### CHARACTER:

- » High-alloy **hot-work steel**, high heat resistance, high wear resistance, good toughness, thermal conductivity and hot cracks resistance; for very high requirements available in grade \*ESR (Electro-Slag Remelted)

### APPLICATION:

- » Standard material for hot-work tools, extrusion moulds, dies, moulds for plastic processing

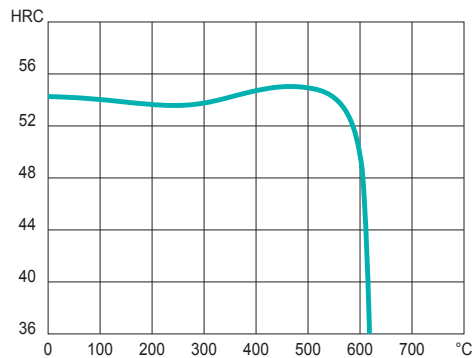
### TREATMENT BY:

- » Polishing, etching, EDM, nitriding: possible
- » Hard chrome plating: in special cases

### HEAT TREATMENT:

- » Soft annealing: 750 to 800 °C for about 4 to 5 hours  
 slow controlled cooling inside the furnace: 10 to 20 °C per hour to about 600 °C; further cooling in air, **max. 230 HB**
- » Hardening: 1020 to 1060 °C  
 keep curing temperature for 15 to 30 minutes  
 quenching in oil/air/compressed gas/hot bath  
 obtainable hardness: **54 HRC**
- » Tempering: slow heating to tempering temperature immediately after hardening; minimum time in furnace: 1 hour per 20 mm part thickness

### TEMPERING CHART:



ESR)\* Electro-Slag Remelted