

MATERIAL NO.:

1.2312

DESIGNATION ACCORDING TO:

DIN: 40 CrMnMoS 8-6
AFNOR: 40 CMD 8.S
UNI: -
AISI: P20 + S

TECHNICAL TIP:

» For increased surface quality requirements use material grade 1.2311.

TYPICAL ANALYSIS:

C 0.40
Si 0.40
Mn 1.50
Cr 1.90
Mo 0.20
S 0.06

HARDNESS:

280-325 HB
(≈ 950-1100 N/mm²)

THERMAL CONDUCTIVITY AT 100 °C:

35 $\frac{W}{m \cdot K}$

COEFFICIENT OF THERMAL EXPANSION [10⁻⁶/K]

100 °C	200 °C	300 °C	400 °C	500 °C	600 °C	700 °C
12.1	12.8	13.3	13.6			

CHARACTER:

» Alloyed and pre-toughened **tool steel** with excellent machinability in the hardened condition because of the sulphur additive; high dimensional stability

APPLICATION:

» Plates for mould bases and dies with increased requirements on strength; high-tensile machine parts

MACHINING:

» Polishing:
technical polishing possible; for higher surface requirements we recommend 1.2311 or 1.2738
» Etching, EDM:
not recommended
» Nitriding:
increases the steel's wear resistance

HEAT TREATMENT:

Already pre-toughened; usually no heat treatment required

» Soft annealing:
720 to 740 °C for about 2 to 4 hours
slow controlled cooling inside the furnace
» Nitriding:
before nitriding, stress-relieving heat treatment at 580 °C (Meusburger standard) is recommended.
» Hardening:
840 to 860 °C
quenching in oil/hot bath (180 to 220 °C)
obtainable hardness: **52 HRC**
» Tempering:
slow heating to tempering temperature immediately after hardening;
minimum time in furnace: 1 hour per 25 mm part thickness

TEMPERING GRAPH:

