1. **Main characteristics and applications**

Steel with good hardening penetration and good tool workability, also in hardened and tempered condition, thanks to the high level of sulphur.

The main application is for plastic material dies also in large sizes, on condition that surface finish properties are not too excessive.

It is also used for plates, dies box, dies of light alloys with low melting point.

It is steel suitable for nitriding (around 800 HV) and chrome plating.

2. **Comparable standards**

UNI  W.Nr  DIN  AFNOR  AISI/SAE  BS
- 1.2312  X40CrMnMo58-6 (40CMD8S)  P20 -

3. **Chemical analysis**

<table>
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<th></th>
<th>C</th>
<th>Mn</th>
<th>Si</th>
<th>Cr</th>
<th>Mo</th>
<th>S</th>
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<td>0.10</td>
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4. **Critical points**

Ac1  740 °C  
Ms   310 °C

5. **Supply Conditions**

Hardened and Tempered HB 270 - 310

6. **Heat treatments**

**Annealing**
- Heat to 720 - 750 °C for 2 - 4 h furnace cool

**Stress relieving**
- Up to 560 - 600 °C, hold for 2 - 4 h
- Furnace or steel air cooling

**Hardening**
- Preheating to 600 - 650 °C
- Heat to hardening temperature to 840 - 870 °C and hold at temperature
- Cooling in oil
- Hardness after hardening: HRC 51

**Tempering**
- To be carried out soon after the hardening in the range 580 - 650 °C for 1 hour for 25 mm of thickness minimum 2 h
7 C.C.T. curve

Austenitizing temperature: 850°C

8 Tempering curve