**P20+Ni** is an upgrade version of plastic mold steel 01 2311, which is normally supplied in pre-hardened condition. Hardness in the as-supplied condition is 280-320 HB. The additional nickel content of 1% increases through hardening. It is micro-alloyed, with good machinability, suitable for texturing, outstanding polishability, adequate corrosion resistance, vacuum-degassed steel with the following excellent features.

**Steel properties**

- **Coefficient of thermal expansion**
  - 10^-6 m/(m × K): 11.2, 12.8, 13.5, 13.7, 14.3, 14.7, 14.9

- **Thermal conductivity**
  - at °C: 20, 350, 700
  - W/(m × K): 36, 34, 33

**Applications**

- P20 is equivalent grade of most popular steel grade of DIN 2738 which is applicable for large & small plastic mould dies for Automotive Industries, Dies for Domestic goods, High finishing plastic Die, Boaster Plates of Presses, Die Holders & Shoe blocks for drop Hammers, Press Cassettes, Upsetter Blocker, forging dies, Different dies & mold for plastic products etc.

**Heat treatment**

- **Soft annealing °C**: 710 - 740
- **Furnace Cooling**: max. 235
- **Hardening °C**: 840 - 870
- **Quenching Polymer or oil**: Hardness after quenching HRC 51
- **Tempering °C**: 100, 200, 300
  - HRC: 51.5, 50.2, 48

**Time-temperature-transformation diagram**

**Tempering diagram**

- Hardness in HRC
  - 0 to 70
  - 0 to 1000 Tempering temperature in °C
  - 0 to 70 Hardness in HRC