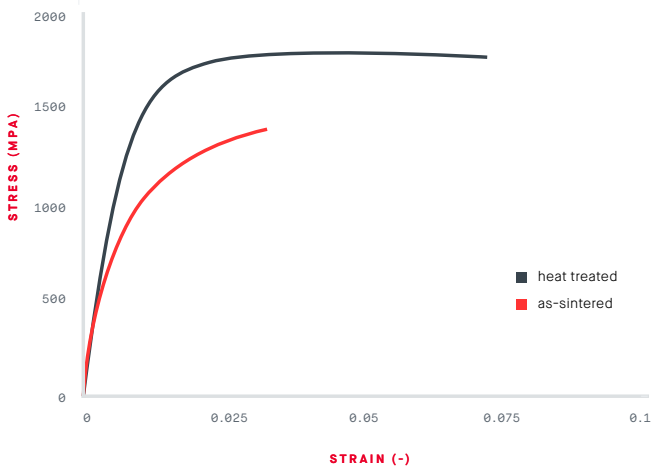
# H13
# tool steel

Characterized by its stability in heat treatment, exceptional hot hardness, and abrasion resistance, H13 is a tool steel widely used in both hot and cold work applications.

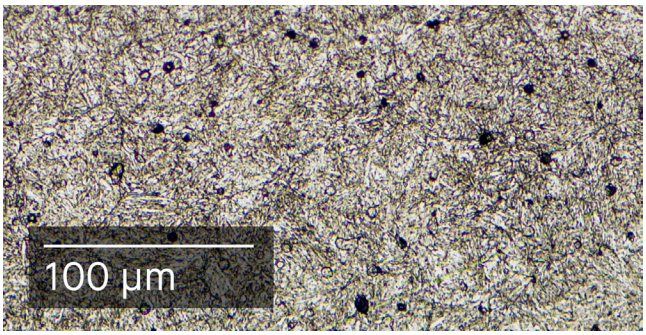



## Composition %

| | |
|---|---|
| Cr | 4.8 – 5.5 |
| Mo | 1.1 – 1.7 |
| Si | 0.8 – 1.2 |
| V | 0.8 – 1.2 |
| C | 0.3 – 0.45 |
| Mn | 0.2 – 0.6 |
| P | 0.03 Max |
| S | 0.03 Max |
| Fe | Balance |

## Other standard designations[4]

| | |
|---|---|
| **UNS** | T20813 |
| **DIN** | 1.2344 |
| **JIS** | SKD61 |




Studio System heat treated microstructure.

## Mechanical properties[1]

| | standard | **Studio System** as-sintered | **Studio System** heat treated[3] | Wrought heat treated, for reference[3] |
|---|---|---|---|---|
| Yield strength (MPa) | ASTM E8[2] | **650** | **1250** | 1525 |
| Ultimate Tensile Strength (MPa) | ASTM E8[2] | **1325** | **1720** | 1950 |
| Elongation at break | ASTM E8[2] | **2.3%** | **5.8%** | 9% |
| Hardness (HRC) | ASTM E18 | **35** | **45** | 54 |
| Density (relative) | | **≥ 93.5%** | — | 100% |

[1] Properties shown reflect beta processing parameters. Properties were obtained for sintering loads between 1.5 kg and 3 kg
[2] Specimens tested according to ASTM E8 with a modified crosshead displacement rate of 0.009 mm/mm/min.
[3] Heat treated samples were air quenched at 1040 °C and double tempered at 540 °C.
[4] Listed designations are for reference purposes only. Composition and mechanical properties may vary.

End-use material performance is impacted (+/-) by certain factors including but not limited to part geometry and design, application and evaluation conditions, etc

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