# DATA SHEET

FINKL STEEL
SCHMOLZ + BICKENBACH GROUP

## 420M®

~AISI 420 - ~1.2083 - ~X40Cr14

STAINLESS MOLD STEEL

### TYPICAL APPLICATIONS

- Plastic Injection molds
- Glass molds
- Corrosive plastics injection molds
- Dies for corrosive plastics extrusion

**GENERAL:**

**Delivery Condition:**

Annealed ~ 229 BHN
Available in EAF VD Quality
Premium Qualities ESR or VAR
Ultra Quality (ESR+VAR)

**420M®** is a stainless mold steel grade specially designed for wear resistance, polishability, improved corrosion resistance compared to standard grades and simple post-production mold maintenance.

**420M®** is recommended for plastics, glass, and other materials requiring molds exhibiting exellent polishability. The addition of the molybdenum improves the corrosion resistance of 420M versus AISI 420. This may reduce or eliminate the need to chrome plate molds in order to avoid corrosion.

**420M®** exhibits improved toughness over AISI 420 stainless steel. 420 stainless steel. The DBTT curve illustrates its increased impact toughness at all test temperatures. Premium Quality increases the toughness even further resulting in molds and dies with greater resistance to cracking and catastrophic failure.

### Typical Chemical Analysis - % weight

| C | Mn | Si | Cr | Mo | Other |
|---|---|---|---|---|---|
| 0.35 | 0.50 | 0.35 | 13.0 | 0.50 | Micro alloying |

**420M®** is melted to a low sulphur content to enhance polishability.

**420M®** is characterized by :

- Improved corrosion resistance
- Best polishability
- Improved wear resistance
- Higher Fracture toughness than standard grades

**420M®** is forged on our largest presses equipped with wide dies assuring maximum deformation during forging process.

**420M®** is 100 % ultrasonic tested to very stringent acceptance levels. It is defect free.

Premium Quality **420M®** (ESR or VAR) is especially recommended for plastic lenses or other high quality optical applications.

Ultra Quality is now available for applications requiring ISO N0 surface finish. Its double remelting process provides the purest corrosion resistant steel.

**®Finkl Steel Trademark**

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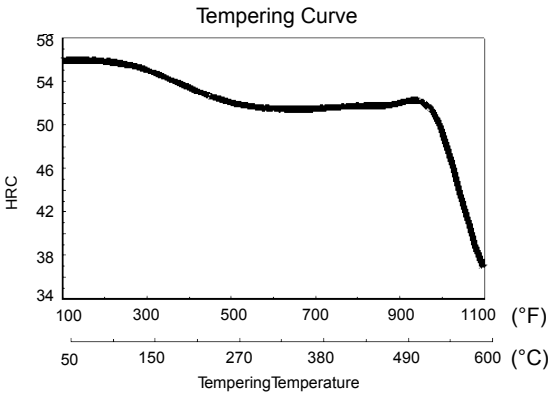
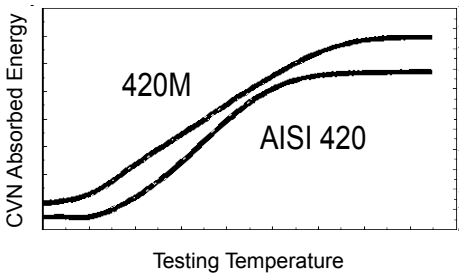
## STAINLESS MOLD STEEL

## 420M®

### MATERIAL CHARACTERISTICS




### PROPERTIES 420M®

- **Cleanliness**

| EAF VD | A | B | C | D |
|---|---|---|---|---|
| ASTM E45 | ≤ 1.5 | ≤ 1.0 | ≤ 0.5 | ≤ 1.0 |
| DIN 50602 | K4 ≤ 20 | | | |

**Premium Quality 420M®**

| ESR | A | B | C | D |
|---|---|---|---|---|
| ASTM E45 | ≤ 0.5 | ≤ 0.5 | 0 | ≤ 1.0 |
| DIN 50602 | K1 ≤ 50 | | | |

| VAR | A | B | C | D |
|---|---|---|---|---|
| ASTM E45 | ≤ 1.0 | ≤ 0.5 | 0 | ≤ 0.5 |
| DIN 50602 | K1 ≤ 20 | | | |

**Ultra Quality 420M®**

| ESR+VAR | A | B | C | D |
|---|---|---|---|---|
| ASTM E45 | ≤ 0.5 | 0 | 0 | 0 |
| DIN 50602 | K0 ≤ 50 | | | |

- **Physical Properties:**

| Thermal conductivity | Thermal expansion coefficient ($10^{-6}$ $K^{-1}$) | | | Thermal capacity | Density |
|---|---|---|---|---|---|
| ($W.m^{-1}.K^{-1}$) | 25-100 °C | 25-300 °C | 25-400°C | ($J.Kg^{-1}.K^{-1}$) | g/cm3 |
| 23.5 | 10.98 | 11.25 | 11.52 | 460.5 | 7.76 |

### HEAT TREATMENT

| Process | Temperature | Cooling (Quenching) |
|---|---|---|
| Annealing | 1425-1500 °F (775-815 °C) | Slow cool in furnace |
| Stress Relieving | 50-100 °F (30-55 °C) below final tempering temperature | Slow cool to [875 °F] (470 °C), then in air |
| Preheating | 700-1225 °F (370-660 °C) | Preheat in two stages |
| Hardening | 1850-1950 °F (1010-1065 °C) soaking 30 min. | Oil or salt bath [650-850 °F] (340-450 °C) |
| Tempering | See figure, hold 1hr/inch (25 min/cm) of thickness | Air |

**Note: Provided technical data and information in this data sheet are typical values. Normal variations in chemistry, size and conditions of heat treatment may cause deviations from these values. We suggest that information be verified at time of enquiry or order. For additional data or metallurgical assistance, please contact us.**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