

# 全球钢号百科!

Global Steel Grade Encyclopedia



### 涵盖的行业或国家与地区类别



















16元末元)住

日本汽车标准组织

EN















### DATA SHEET

### **SHELLEX®**

~ W.Nr. 1.2367 - X38CrMoV5-3 HOT WORK TOOL STEEL

### **TYPICAL APPLICATIONS**

- Tooling for Die Casting
- Aluminum and magnesium extrusion dies
- · Die inserts and forging dies
- Plastic Mold Dies
- Cores, sleeves and slides

#### **GENERAL**

Delivery Condition: Annealed to 235 BHN Max.

EFVD or EFVD + VAR

Finkl ShelleX® is a remarkably tough, long lasting, Cr-Mo-V steel with excellent high temperature physical properties and a patented chemistry that reduces primary carbide formation for improved fracture toughness. Shellex® was designed for those applications that need greater wear, tempering resistance, and heat checking resistance than can be obtained from standard H11, H13 or 1.2367 die steels.

**ShelleX**® exhibits higher strength and surface hardness at room temperature than H11, H13 or 1.2367 type alloys when tempered at identical tempering temperatures. **ShelleX**® also better resists softening at elevated operating temperatures (see figure). The high temperature strength and tempering resistance, in conjunction with its heat checking resistance, enables **ShelleX**® to achieve increased production quantities before maintenance is required.

### Typical Chemical Analysis\* - % weight

С	Mn	Si	Cr	Мо	V
0.36	0.35	0.90	5.00	2.85	0.25

\*Covered under U.S. Patent: 6,019,938

**ShelleX**® is available in single-melt (EFVD) or remelt (EFVD+VAR) quality. The VAR process creates a highly refined structured with exceptionally low levels of microsegregation (banding) and nonmetallic inclusions. The result is a product with the highest possible toughness at all strength levels.

**ShelleX**® is forged using a special densifying process which assures optimum consolidation of centers.

**ShelleX**<sup>®</sup> is forged on our largest presses equipped with wide dies assuring maximum deformation during forging process.

**ShelleX**® is characterized by:

- Improved wear resistance
- Improved temper resistance
- Improved fracture toughness
- High temperature strength
- High impact resistance

**ShelleX**® is 100% ultrasonic tested to very high standards. It is defect free.

### www.steels.org.cn

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## HOT WORK TOOL STEEL ShelleX®

### **HEAT TREATMENT**

### **ANNEALING**

Temperature: 1525-1575°F (829-857°C) Rate of cooling: 25°F (15°C) max per hour Typical annealed hardness: 235 BHN Max

### **HARDENING**

Preheat slowly in two stages; first to 1000-1225°F (540-660°C) and then 1500-1600°F (815-870°C)

Austenitizing Temperature: 1850-1885°F (1010-1030°C)

Soak: 30-45 minutes at temperature

Quench: Vacuum furnace with 2 bar min backfill or hot oil;

quench to 300°F (150°C)

#### **TEMPERING**

Temperature: See figure for temperature-hardness relationship; a minimum tempering temperature of 1050°F (565°C) is recommended

Soak: Hold a minimum of 1 hour per inch (25 min. per cm)

of cross section for each tempering operation

Cooling: Air cool

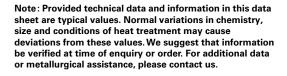
Double-tempering is recommended

### **STRESS RELIEVING**

Temperature: 50-100°F (30-55°C) below the final

tempering temperature

Cooling: Slow cool to 875°F (470°C) and then air cool



### SIZE

(Finished / approx.)

Max weight	16330 kg	36000 lbs
Max section	0.90 m <sup>2</sup>	1400 sq in
Max width	1 <b>270</b> mm	5 <b>0</b> "
Max thickness	760 mm	30"

