



钢铁之家

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全球钢号百科!

Global Steel Grade Encyclopedia



涵盖的行业或国家与地区类别



国材料与试验协会

GJB

国家军用标准



动力机械工程师协会

EU

前欧洲标准化

AISI

美国钢铁学会



德国工业标准

AMS

航空航天材料规范



国际标准

JASO

日本汽车标准组织

EN

欧洲标准

JB

机械行业标准

UNS

统一编号系统

UNI

意大利标准



美国机械工程师协会

SS

瑞典标准



国家标准



日本工业标准

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

C	Mn	Si	Cr	Mo	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 structure 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® 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.

DATA SHEET

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

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.

SIZE

(Finished / approx.)

Max weight	16330 kg	36000 lbs
Max section	0.90 m ²	1400 sq in
Max width	1270 mm	50"
Max thickness	760 mm	30"

