

# DATA SHEET



**Finkl Steel**

## **SHELLDIE®**

~AISI H11 - W.Nr. 1.2343 - X37CrMoV5-1

## **HOT WORK TOOL STEEL**

### **TYPICAL APPLICATIONS**

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

### **GENERAL**

#### **Delivery Condition:**

Annealed to 229 BHN Max.  
EFVD, ESR or VAR

Non-NADCA: **SD®**

NADCA Grade E: **SDQ® ESR or VAR**

**ShellDie®** is a high quality tool steel with high impact resistance. They also has good wear and heat checking resistance at high temperature.

**SD®** is a H11 modified type steel with higher molybdenum for added heat resistance over standard H11. Alloy composition is balanced in order to reduce primary carbide formation for improved fracture toughness.

**SD®** and **SDQ®** have an excellent combination of high strength and toughness at high temperature and can reach hardnesses typically in the 42 to 52 HRC with standard hardening procedures by most vacuum heat treating operations.

### **Typical Chemical Analysis - % weight**

| C    | Mn   | Si   | Cr   | Mo   | V    |
|------|------|------|------|------|------|
| 0.36 | 0.55 | 0.50 | 5.15 | 1.85 | 0.35 |

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

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

**SD®** is characterized by :

- Improved wear resistance
- Improved heat checking resistance
- Improved fracture toughness
- High temperature strength
- High impact resistance

**SD®** and **SDQ®** are 100% ultrasonic tested to very stringent acceptance levels.

**SDQ®** can be supplied pre-certified to NADCA standard #207 Grade E on request.

**®Finkl Steel Trademark**

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## HOT WORK TOOL STEEL

### SHELLDIE®

#### HEAT TREATMENT

##### ANNEALING

Temperature: 1500-1550°F (815-845°C)  
Rate of cooling: 25°F (15°C) max per hour  
Typical annealed hardness: 229 BHN Max.

Key parameter of the NADCA recommended procedure for hardening dies for die casting service are:

##### HARDENING

Rate of heating: slow  
Preheat Temperature: 1200-1300°F (650-705°C)  
Hardening Temperature: 1810-1885°F (985-1030°C)  
Time at temperature: 30-45 minutes  
Quenching to 300°F (150°C)

##### TEMPERING

Tempering Temperature: 1050°F (565°C) minimum

##### STRESS RELIEVING

Temperature: 50-100°F (30-55°C) below final tempering temperature and slow cool to 875°F (470°C), 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 SD®

(Finished / approx.)

|               |                     |             |
|---------------|---------------------|-------------|
| Max weight    | 16 330 kg           | 36 000 lbs  |
| Max section   | 0.90 m <sup>2</sup> | 1 400 sq in |
| Max width     | 1 270 mm            | 50"         |
| Max thickness | 760 mm              | 30"         |



PARTNER PROGRAM®

FINKL STEEL offers select customers the opportunity to participate in the Finkl Partner Program, a Web-based system that allow for:

- Online quoting and ordering
- Real-time order tracking
- Customized report generation

Contact your Finkl representative to learn more about online business services.

#### Finkl Steel—Chicago

1355 E. 93rd Street  
Chicago, IL 60619

773.975.2510  
TOLL-FREE: 800.621.1460  
FAX: 773.348.5347  
[www.finkl.com](http://www.finkl.com)

#### Finkl Steel—Sorel

100 McCarthy Street  
St-Joseph-de-Sorel  
Quebec, Canada J3R 3M8

450.746.4122  
TOLL-FREE: 800.363.9484  
[www.sorelforge.com](http://www.sorelforge.com)

#### Finkl Steel—Composite

2300 W. Jefferson Avenue  
Detroit, MI 48216  
313.496.8599



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