

Hot Work Die Steels

CX®

FX-XTRA®

DURODI®

WF-XTRA®

SHELLDIE®

DC®

SHELLEX®

PRESS-X®



Finkl Steel



The Finkl Name

Since its founding in 1879 as a small blacksmith shop, Finkl Steel has emerged as the dominant producer of hot work die steels, mold steels, and custom forgings.

Finkl Steel's business is global, its products are the highest quality available, and its processes are the most technologically advanced in the forging industry.

Finkl Steel is an industry leader in innovation with more than 100 patents to its credit. Finkl Steel's formulations and steel-making technologies set worldwide standards.

Finkl Steel is truly THE NAME in Die Steel.



All our die materials are hardness tested and ultrasonically inspected to Finkl standards and customer specification.



A Tradition of Quality

Over 143 years of innovation, craftsmanship, and quality have earned Finkl Steel its position as the leading supplier of forging die materials. Modern manufacturing technology, thorough quality assurance procedures, and robust inspection methods ensure consistent die steel quality. Our customer service personnel provide personalized assistance and up-to-the-minute order status.

Every heat of steel produced by Finkl Steel is vacuum refined to produce the cleanest, most uniform die steel available in the world market. Our large open-die forging presses enable true wide-die forging techniques to provide optimum hot work and forging quality. Highly efficient heat-treatment furnaces and controlled water quenching techniques produce the greatest uniformity and through hardness characteristics achievable. In compliance with the company's accreditation to ISO 9001, quality assurance checks are conducted at every step of the manufacturing process. From the initial molten steel chemistry to the final certified hardness; each successive test result is logged into our custom manufacturing system. These results are immediately available to Finkl personnel and to the customer through the Finkl Partner Program—the company's fully functional online quoting, ordering and order status portal.



Hammer Die Tooling Materials

CX[®]

A high toughness, high ductility forging die steel recommended for forging applications where resistance to fracture is a prime requirement. CX excels in many challenging forging applications, such as warm and near-net shape forging, where other die steels fail due to fracture. CX is also commonly used for replacement rams and sow blocks where the forge shop wishes to upgrade OEM equipment.

FX-XTRA[®]

A remarkably tough, long lasting, Ni-Cr-Mo steel with excellent high temperature physical properties. Special machining quality reduces machining costs and machine loads, making it possible to sink FX-XTRA dies as hard as 477 BHN. FX-XTRA has earned an unparalleled reputation in the industry as a versatile workhorse alloy with applications from die blocks to machine components.

DURODI[®]

DURODI is suitable for closed die forging hammers, and mechanical and hydraulic forging presses. The material hardens deeply and uniformly to a high hardness that holds up exceedingly well under impact and thermal shock.

WF-XTRA[®]

WF-XTRA die steel is used where longer die life is desired and is especially suited to resist heat checking. This well balanced Ni-Cr-Mo alloy exhibits high hardenability, toughness, wear resistance, and excellent high temperature physical properties.

HIGHLIGHTS

- *Excellent ductility and toughness*
- *Good for shallow or deep impressions*
- *Good material choice for ancillary components*

CHEMISTRY

CARBON	0.34%
MANGANESE	0.48%
SILICON	0.23%
NICKEL	2.85%
CHROMIUM	1.15%
MOLYBDENUM	0.73%
VANADIUM	0.12%

PROPERTIES

	LOW	MEDIUM	HIGH
WEAR RESISTANCE	■		
MACHINABILITY			■
TOUGHNESS			■
OPERATING TEMP	■		

- *Versatile*
- *Good for shallow or deep impressions*
- *Good material choice for ancillary components*

CARBON	0.50%
MANGANESE	0.85%
SILICON	0.25%
NICKEL	0.90%
CHROMIUM	1.15%
MOLYBDENUM	0.50%
MICRO-ALLOY ADDITIONS	

	LOW	MEDIUM	HIGH
WEAR RESISTANCE	■		
MACHINABILITY		■	
TOUGHNESS			■
OPERATING TEMP		■	

- *Wide temperature operating range*
- *Good wear resistance*
- *Good material choice for ancillary components*

CARBON	0.55%
MANGANESE	0.60%
SILICON	0.50%
NICKEL	1.60%
CHROMIUM	1.00%
MOLYBDENUM	0.80%
MICRO-ALLOY ADDITIONS	

	LOW	MEDIUM	HIGH
WEAR RESISTANCE		■	
MACHINABILITY		■	
TOUGHNESS		■	
OPERATING TEMP		■	

- *Excellent wear while maintaining toughness*
- *Good for shallow or deep impressions*
- *Excellent through hardening*

CARBON	0.42%
MANGANESE	0.75%
SILICON	0.50%
NICKEL	0.80%
CHROMIUM	2.50%
MOLYBDENUM	1.00%
VANADIUM	0.08%
MICRO-ALLOY ADDITIONS	

	LOW	MEDIUM	HIGH
WEAR RESISTANCE		■	
MACHINABILITY		■	
TOUGHNESS		■	
OPERATING TEMP			■



Press Die Tooling Materials

SHELLDIE®

SHELLDIE is a high chromium, molybdenum, vanadium grade offering excellent wear resistance at higher operating temperatures. This material exhibits remarkable resistance to abrasion and will maintain its hardness throughout the forging process.

DC®

DC has excellent abrasion resistance due to high vanadium content that forms extremely hard vanadium carbide particles. However, as this material is sensitive to fracture at room temperature, die preheating is mandatory.

SHELLEX®

SHELLEX is similar to SHELLDIE but with nearly twice the molybdenum content for superior wear resistance under conditions of high die operating temperatures. SHELLEX was designed for applications that need greater resistance to wear, tempering, and heat-checking.

PRESS-X®

A precipitation hardening die steel capable of “recovering” from overheated conditions. Low carbon (0.20%) avoids development of a brittle surface layer that can lead to heat-checking. The precipitation hardening characteristics of PRESS-X minimize softening from overheated conditions. The heat from the forging process actually “ages” the die surface to a higher hardness.

HIGHLIGHTS

- *Reduced vanadium*
- *Enhanced ductility*
- *Good resistance to abrasion*

CHEMISTRY

CARBON	0.36%
MANGANESE	0.60%
SILICON	1.00%
CHROMIUM	5.00%
MOLYBDENUM	1.85%
VANADIUM	0.30%

PROPERTIES

	LOW	MEDIUM	HIGH
WEAR RESISTANCE		■	
MACHINABILITY		■	
TOUGHNESS		■	
OPERATING TEMP			■

- *Good heat treat response*
- *Good hot strength*
- *Good for shallow or deep impressions*

CARBON	0.40%
MANGANESE	0.40%
SILICON	1.00%
CHROMIUM	5.20%
MOLYBDENUM	1.50%
VANADIUM	0.90%

	LOW	MEDIUM	HIGH
WEAR RESISTANCE		■	
MACHINABILITY		■	
TOUGHNESS	■		
OPERATING TEMP			■

- *Elevated levels of molybdenum*
- *Excellent heat check properties*
- *Good for shallow or deep impressions*

CARBON	0.36%
MANGANESE	0.60%
SILICON	0.90%
CHROMIUM	5.00%
MOLYBDENUM	2.85%
VANADIUM	0.25%

	LOW	MEDIUM	HIGH
WEAR RESISTANCE			■
MACHINABILITY	■		
TOUGHNESS		■	
OPERATING TEMP			■

- *Precipitation hardened alloy*
- *Must be pre-heated*
- *Excellent resistance to heat checking*
- *Good for shallow impressions*

CARBON	0.20%
MANGANESE	0.70%
SILICON	0.30%
NICKEL	3.25%
MOLYBDENUM	3.35%

	LOW	MEDIUM	HIGH
WEAR RESISTANCE			■
MACHINABILITY	■		
TOUGHNESS		■	
OPERATING TEMP			■

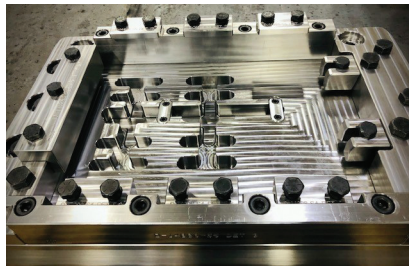


Finkl Steel

Where Progress is a Tradition

The Finkl Steel family of die steels provides a full range of alloy compositions and heat-treat properties to address even the most complex challenges confronting the modern forge shop. Each grade was created to solve common tooling challenges that have historically been found during the closed-die forging process. Customized grades were created to provide added wear and fracture resistance.

Not only are the materials used for die steel, but they are also commonly used for ancillary parts like sows, bolsters, and rams.



The variety of grades, along with the vast experience of the Finkl team, are available today to help customize your solution.

Contact us today and find out why
Finkl Steel is THE NAME in Die Steel.



Finkl Steel

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more about our unique,
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