



EXELL™ HOLDER

Mold & Die Steel



ELLWOOD

YOUR METALS PARTNER, FROM MELT TO DISTRIBUTION

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EXELL™ HOLDER

ExELL™ Holder was developed by ELLWOOD Specialty Steel as a high quality tooling grade of chromium-molybdenum alloyed steel. This grade is resulfurized for free machining characteristics.

ExELL™ Holder is supplied in a heat treated and tempered condition. Typical surface hardness is 262-321 HB (Brinell). This alloy has limited hardenability and interior hardness would be lower than surface hardness levels.

APPLICATIONS

ExELL™ Holder is designed especially for plastic mold holders/bases and holder blocks for die casting dies. For low requirements of polishability, ExELL Holder can also be used for certain plastic and rubber molds.

Other applications include:

- Backers/Holders for Forging Dies
- Support Plates
- Machine Parts
- Jigs and Fixtures

TYPICAL ANALYSIS	
C	0.38-0.47
Si	0.20-0.40
S	0.03-0.07
Mn	1.20-1.38
Cr	0.70-0.97
Mo	0.16-0.20

IMPROVED MANUFACTURING AND RELATED PERFORMANCE

ExELL™ Holder is manufactured to standards of high tooling quality for optimum service performance. From melting through final product testing, the finished product is a material with very good structure and mechanical property uniformity.

Some specifics of manufacturing include:

- Precise chemistry control
- Heavy forging reductions
- Prehardened via heat treatment
- Complete testing and quality assurance within facilities certified to ISO 9002

CHARACTERISTICS

ExELL™ Holder exhibits excellent machinability for a prehardened material. Typical supplied hardness provides good resistance to indentation and mechanical strength, while pre-heat treatment creates good economy for various machined components.

PROPERTIES

PHYSICAL PROPERTIES

Coefficient of Thermal Expansion, in/in/F

- 70-400 F - 0.0000070
- 70-600 F - 0.00000725
- 70-800 F - 0.0000075

Thermal Conductivity, BTU/ft hr F

- 70 F - 17
- 400 F - 17.5
- 750 F - 18

Density, lbs/cu.in.

- 70 F - 0.2833

MECHANICAL PROPERTIES: (HARDNESS 285HB)		
Test Temp (F)	Yield Strength (psi)	Tensile Strength (psi)
70	115,000	140,000
400	110,000	135,000
750	90,000	110,000
1100	32,000	72,000

HEAT TREATMENT (General Recommendations)

NORMALIZING

- Protect against oxidation and heat uniformly to 1650F and cool in still air.

STRESS RELIEVING

- To minimize movement during service, a stress relief can be used between the rough and finish machine operations of part making using prehardened material.
- After rough machining, heat the part(s) to 950F, equalize and hold 1-2 hours. Cool slowly to room temperature.

ANNEALING

- With a protective atmosphere or vacuum furnace, heat slowly to 1550-1650F. Equalize and hold one hour per inch of thickness.
- Furnace cool 20F/hr to 1000F and equalize. Air cool to room temperature.

HARDENING AND QUENCHING

***Note: heat treatment of machined parts involves a high risk of cracking.**

PREHEATING:

Protect against oxidation and decarburization. Heat to 1300-1350F and equalize. Continue heating to hardening temperature.

HARDENING:

Heat to 1525-1575F, equalize and hold 30 minutes at temperature.

QUENCHING:

Quench in oil or equivalent medium to about 300F.

TEMPERING:

Temper as soon as quenching temperature reaches 120-150F.

TEMPERING

Temper immediately after quenching to 150F. Usual tempering range is 900-1300F with time at temperature of 2 hours (heavy sections should be tempered a minimum of 1 hour per inch of section). Hardness response will vary with size and tempering temperature and should be established through trial or experience.

TOOLMAKING

For additional information including welding, machining, grinding or EDM processing, please contact ELLWOOD Specialty Steel direct at 800.932.2188.



CAPABILITIES

ELLWOOD Specialty Steel is a fully integrated producer of a wide range of specialty tool steels.

Our ExELL™ grades are made with advanced ASEA-SKF steel making capabilities which include an ultra high powered electric arc furnace with subsequent state of the art ladle refining and vacuum degassing equipment for the most complete and modern ladle metallurgy.

QUALITY ASSURANCE

ELLWOOD Specialty Steel is committed to providing products and services which consistently meet or exceed your quality and performance expectations. We will provide customer and technical service that will ensure complete satisfaction.

As a flexible provider, we will establish product programs to fully support industry or customer requirements. Our extensive stock programs are supported by short mill lead times of custom forged products.

Customized stock programs are available for specific customer needs.

This information is intended to provide general data on our products, their uses and is based on our knowledge at the time of publication. No information should be construed as a guarantee of specific properties of the procedures described or suitability for a particular application. ELLWOOD Specialty Steel reserves the right to make changes in practices which may render some information outdated or obsolete. ELLWOOD Specialty Steel should be consulted for current information and/or capabilities.



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