ELLWOOD SPECIALTY STEEL

ExELL HOLDER

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

Being a very flexible provider, Ellwood Specialty Steel will establish product programs to fully support industry or customer requirements. Our extensive stock programs of ExELL P-20M and ExELL Holder are supported by very short mill lead times of custom forged products.

Customized stock programs are and can be designed for specific customer needs.

ELLWOOD SPECIALTY STEEL

Your tool and mold steel specialist

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ExELL HOLDER

ELLWOOD SPECIALTY STEEL

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 normally supplied in a heat treated and tempered condition. Typical supplied surface hardness is 262-321 HB (Brinell). This general chemisty has limited hardenability and interior hardness would be lower than surface hardness lev-

TYPICAL ANALYSIS			
C	0.38-0.47	S	0.07-0.10
Mn	1.20-1.38	Cr	0.70-0.97
Si	0.20-0.40	Mo	0.16-0.20

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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 manufacturing specifics include:

- Very precise chemistry control
- Heavy forging reductions
- Prehardening
- 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 allows very good economy for various machined components.

TYPICAL 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
- Construction/machine parts
- Jigs and fixtures

HEAT TREATMENT (General Recommendations)

ExELL Holder is normally supplied in the prehardened condition. However, the following thermal treatment data may be useful if stress relieving, normalizing, annealing, or re-heat treatment is desired.
*See note under Hardening and Quenching for risk of cracking during heat treatment.

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 to 950F (for prehardened material), equalize and hold 1-2 hours. Cool slowly to room temperature.

NORMALIZING

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

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.

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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 about 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.

PROPERTIES

Physical Properties:

Coefficient of Thermal Expansion, in/in/F

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

Thermal Conductivity, BTU in/ft² hr F

70 F.....202
400F.....209
750F.....216

Critical Temperature:

Ac1 - 1350F

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

TOOLMAKING

For any additional information including welding, machining, grinding or EDM processing, please contact Ellwood Specialty Steel direct at: **800-932-2188**