

## Crucible Steel Nu-Die® XL (Premium Quality AISI H13) Tool Steel

Category : Metal , Ferrous Metal , Tool Steel , Air-Hardening Steel

### Material Notes:

Nu-Die XL (AISI H13) is a premium version of H13 tool steel manufactured, tested and certified to meet stringent die casting industry specifications issued by NADCA, Chrysler and others. It offers better transverse toughness than standard H13, reducing the susceptibility to breaking or cracking. Nu-Die XL is double melted and specially processed to improve its microstructural uniformity and microcleanliness, making it an excellent choice for critical polishability and more resistant to thermal fatigue. Nu-Die XL can be used in any application where standard H13\* is used. Crucible stocks Nu-Die XL primarily in blocks and flats in the annealed condition. H13 is a versatile, air-hardenable hot work tool steel providing moderate wear resistance along with good toughness, good heat check resistance, and high temperature strength up to 1000°F (540°C) with brief exposures up to 1100°F (595°C). Information provided by Crucible Specialty Metals.

Order this product through the following link:

[http://www.lookpolymers.com/polymer\\_Crucible-Steel-Nu-Die-XL-Premium-Quality-AISI-H13-Tool-Steel.php](http://www.lookpolymers.com/polymer_Crucible-Steel-Nu-Die-XL-Premium-Quality-AISI-H13-Tool-Steel.php)

| Physical Properties | Metric    | English                  | Comments |
|---------------------|-----------|--------------------------|----------|
| Density             | 7.75 g/cc | 0.280 lb/in <sup>3</sup> |          |

| Mechanical Properties | Metric    | English    | Comments                                                                  |
|-----------------------|-----------|------------|---------------------------------------------------------------------------|
| Hardness, Brinell     | 192 - 235 | 192 - 235  | Annealed                                                                  |
| Hardness, Rockwell C  | 40 - 42   | 40 - 42    | Austenitizing Temperature- 1010°C, air cool, Tempering Temperature- 605°C |
|                       | 51 - 53   | 51 - 53    | Austenitizing Temperature- 1010°C, air cool, Tempering Temperature- 540°C |
| Modulus of Elasticity | 207 GPa   | 30000 ksi  |                                                                           |
| Charpy Impact         | 14.0 J    | 10.3 ft-lb | Austenitizing Temperature- 1010°C, air cool, Tempering Temperature- 540°C |
|                       | 24.0 J    | 17.7 ft-lb | Austenitizing Temperature- 1010°C, air cool, Tempering Temperature- 605°C |

| Thermal Properties | Metric                      | English                    | Comments |
|--------------------|-----------------------------|----------------------------|----------|
| CTE, linear        | 11.0 µm/m-°C                | 6.11 µin/in-°F             |          |
|                    | @Temperature 20.0 - 95.0 °C | @Temperature 68.0 - 203 °F |          |
|                    | 11.5 µm/m-°C                | 6.39 µin/in-°F             |          |
|                    | @Temperature 20.0 - 205 °C  | @Temperature 68.0 - 401 °F |          |
|                    | 12.6 µm/m-°C                | 7.00 µin/in-°F             |          |

| Thermal Properties   | Metric                      | English                           | Comments          |
|----------------------|-----------------------------|-----------------------------------|-------------------|
|                      | @ Temperature 20.0 - 540 °C | @ Temperature 68.0 - 1000 °F      |                   |
| Thermal Conductivity | 26.0 W/m-K                  | 180 BTU-in/hr-ft <sup>2</sup> -°F |                   |
|                      | @Temperature 95.0 °C        | @Temperature 203 °F               |                   |
|                      | 27.7 W/m-K                  | 192 BTU-in/hr-ft <sup>2</sup> -°F |                   |
|                      | @Temperature 315 °C         | @Temperature 599 °F               |                   |
| Shrinkage            | -0.100 %                    | -0.100 %                          | Tempered at 400°F |
|                      | @Temperature 204 °C         | @Temperature 400 °F               |                   |

| Component Elements Properties | Metric      | English     | Comments     |
|-------------------------------|-------------|-------------|--------------|
| Carbon, C                     | 0.40 %      | 0.40 %      |              |
| Chromium, Cr                  | 5.2 %       | 5.2 %       |              |
| Iron, Fe                      | 91.147 %    | 91.147 %    | As Remainder |
| Molybdenum, Mo                | 1.3 %       | 1.3 %       |              |
| Silicon, Si                   | 1.0 %       | 1.0 %       |              |
| Sulfur, S                     | <= 0.0030 % | <= 0.0030 % |              |
| Vanadium, V                   | 0.95 %      | 0.95 %      |              |

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