

## Dura-Bar G2 Continuously Cast Gray Iron Bar Stock ASTM A48

Category : Metal , Ferrous Metal , Cast Iron , Alloy Cast Iron , Gray Cast Iron

### Material Notes:

Continuously cast ductile iron bar stock is produced in a wide variety of sizes and shapes, including rounds, rectangles and special shape cross sections. It often is used as an alternative to gray iron castings. The continuous casting process eliminates typical foundry defects, such as gas holes, hard spots, slag inclusions and inconsistent properties, that result from different molding methods. Bars are cast through a water-cooled graphite die mounted on the bottom of a large bar machine crucible. The ferrostatic head pressure created by the molten metal in the bar machine crucible forces iron into the die, producing a very fine-grained microstructure. The outer "rim" is the only part of the bar that is solid when it exits the die. The core is molten iron. Heat from the molten iron core reheats the rapidly chilled outer skin, producing a homogenized microstructure that is cooled to room temperature in still air. Gray iron bar stock's microstructure consists of graphite flakes in a solid metal matrix. The solid metal matrix, in the class 40 grades (Dura-Bar grade G2), is pearlite. The flake graphite provides excellent vibration damping for gears and machine tool components. Textile plant machinery utilize a lot of gray cast iron, because the damping coefficient reduces the factory noise. The same holds true for machine tool components and automotive gears. Compared to ductile iron, which has strengths closer to carbon steel, gray iron is the weaker, more brittle member of the cast iron family. Dura-Bar G2 is still considered an engineered material, having properties that are more than suitable for a wide variety of applications. Composition: Typical chemical composition and ranges, actual values depend on cross section size. Information provided by Dura-Bar.

Order this product through the following link:

[http://www.lookpolymers.com/polymer\\_Dura-Bar-G2-Continuously-Cast-Gray-Iron-Bar-Stock-ASTM-A48.php](http://www.lookpolymers.com/polymer_Dura-Bar-G2-Continuously-Cast-Gray-Iron-Bar-Stock-ASTM-A48.php)

| Physical Properties | Metric           | English                          | Comments                                    |
|---------------------|------------------|----------------------------------|---|
| Density             | 7.06 - 7.34 g/cc | 0.255 - 0.265 lb/in <sup>3</sup> | Approximately 10% lighter than carbon steel |

| Mechanical Properties      | Metric                          | English                           | Comments  |
|----------------------------|---------------------------------|-----------------------------------|---|
| Hardness, Brinell          | 180 - 302                       | 180 - 302                         | Depends on cast section size and location of test                     |
| Tensile Strength, Ultimate | 276 MPa                         | 40000 psi                         | Typical   |
| Elongation at Break        | 1.0 %                           | 1.0 %                             | Typical   |
| Reduction of Area          | 2.0 %                           | 2.0 %                             |   |
| Tensile Modulus            | 124 GPa                         | 18000 ksi                         | Typical   |
| Compressive Yield Strength | >= 827 MPa                      | >= 120000 psi                     | Compressive yield = compressive ultimate, approx 3X tensile strength  |
| Fatigue Strength           | 138 MPa<br>@# of Cycles 1.00e+8 | 20000 psi<br>@# of Cycles 1.00e+8 | rotating beam   |
| Shear Strength             | 400 MPa                         | 58000 psi                         | Shear strength will be 1.2 X tensile strength                         |
| Charpy Impact              | 6.78 J                          | 5.00 ft-lb                        | Gray iron usually not recommended in high impact loading applications |

| Mechanical Properties                     | Metric                                      | English  | Comments                                      |
|---|---|--|---|
| <b>Thermal Properties</b>                 | <b>Metric</b>                               | <b>English</b>                                 | <b>Comments</b>                               |
| CTE, linear                               | 9.00 $\mu\text{m}/\text{m}\cdot\text{°C}$   | 5.00 $\mu\text{in}/\text{in}\cdot\text{°F}$    | Mean  |
|   | @Temperature 21.0 - 100 $\text{°C}$         | @Temperature 69.8 - 212 $\text{°F}$            |   |
|   | 9.50 $\mu\text{m}/\text{m}\cdot\text{°C}$   | 5.28 $\mu\text{in}/\text{in}\cdot\text{°F}$    | Mean  |
|   | @Temperature 21.0 - 300 $\text{°C}$         | @Temperature 69.8 - 572 $\text{°F}$            |   |
| 10.0 $\mu\text{m}/\text{m}\cdot\text{°C}$ | 5.56 $\mu\text{in}/\text{in}\cdot\text{°F}$ | Mean   |   |
| @Temperature 21.0 - 500 $\text{°C}$       | @Temperature 69.8 - 932 $\text{°F}$         |  |   |
| 11.0 $\mu\text{m}/\text{m}\cdot\text{°C}$ | 6.11 $\mu\text{in}/\text{in}\cdot\text{°F}$ | Mean   |   |
| @Temperature 21.0 - 900 $\text{°C}$       | @Temperature 69.8 - 1650 $\text{°F}$        |  |   |
| Specific Heat Capacity                    | 0.506 J/g- $\text{°C}$                      | 0.121 BTU/lb- $\text{°F}$                      |   |
| Thermal Conductivity                      | 53.329 W/m-K                                | 370.08 BTU-in/hr-ft <sup>2</sup> - $\text{°F}$ |   |
| Melting Point                             | 1120 $\text{°C}$                            | 2050 $\text{°F}$                               | Eutectic temp                                 |
| Maximum Service Temperature, Air          | 649 $\text{°C}$                             | 1200 $\text{°F}$                               | Brittle behavior throughout temperature range |
| Minimum Service Temperature, Air          | -59.4 $\text{°C}$                           | -75.0 $\text{°F}$                              |   |

| Component Elements Properties | Metric          | English         | Comments |
|-------------------------------|-----------------|-----------------|----------|
| Antimony, Sb                  | 0.020 - 0.20 %  | 0.020 - 0.20 %  |          |
| Carbon, C                     | 2.7 - 4.0 %     | 2.7 - 4.0 %     |          |
| Chromium, Cr                  | <= 0.050 %      | <= 0.050 %      |          |
| Copper, Cu                    | 0.050 - 0.30 %  | 0.050 - 0.30 %  |          |
| Iron, Fe                      | 95 %            | 95 %            |          |
| Manganese, Mn                 | 0.60 - 0.95 %   | 0.60 - 0.95 %   |          |
| Phosphorous, P                | 0.050 - 0.20 %  | 0.050 - 0.20 %  |          |
| Silicon, Si                   | 1.8 - 3.0 %     | 1.8 - 3.0 %     |          |
| Sulfur, S                     | 0.030 - 0.070 % | 0.030 - 0.070 % |          |
| Tin, Sn                       | 0.10 - 0.30 %   | 0.10 - 0.30 %   |          |

| Electrical Properties | Metric          | English         | Comments                         |
|-----------------------|-----------------|-----------------|----------------------------------|
| Volume Resistivity    | 0.000011 ohm-cm | 0.000011 ohm-cm | At 2.50% Silicon                 |
| Magnetic Permeability | 100 - 150       | 100 - 150       | 25 Oersted, High hysteresis loss |

## Contact Songhan Plastic Technology Co.,Ltd.

Website : [www.lookpolymers.com](http://www.lookpolymers.com)

Email : [sales@lookpolymers.com](mailto:sales@lookpolymers.com)

Tel : +86 021-51131842

Mobile : +86 13061808058

Skype : lookpolymers

Address : United North Road 215,Fengxian District, Shanghai City,China