

## Schmolz + Bickenbach 416 Stainless Steel Bar

Category : Metal , Ferrous Metal , Martensitic , Stainless Steel , T 400 Series Stainless Steel

### Material Notes:

Description: Ugitech™s 416 is free machining martensitic grade. The unique production process developed exclusively by Ugitech results in a product that delivers superior productivity, tool life and consistency, and improves the surface finish on all types of machined parts. Machined parts are frequently used in the annealed condition, but may be heat treated to develop optimum mechanical properties for specific applications. 416 HT, condition T (HRc26-32), is the popular heat-treated version of 416. This condition is specified for numerous engineering applications, and represents the optimum condition for both machinability and corrosion resistance. No further heat treatment of machined parts is required. Hardened and tempered: Heat and hold 500°F to 1000°F (100°C to 400°C) below tempering temperature for 4-7 hours, slow cool. Information provided by Schmolz + Bickenbach

Order this product through the following link:

[http://www.lookpolymers.com/polymer\\_Schmolz-Bickenbach-416-Stainless-Steel-Bar.php](http://www.lookpolymers.com/polymer_Schmolz-Bickenbach-416-Stainless-Steel-Bar.php)

| Physical Properties | Metric    | English                  | Comments |
|---------------------|-----------|--------------------------|----------|
| Density             | 7.64 g/cc | 0.276 lb/in <sup>3</sup> |          |

| Mechanical Properties   | Metric                               | English                              | Comments                               |
|-------------------------|--------------------------------------|--------------------------------------|--|
| Hardness, Brinell       | 264 - 294                            | 264 - 294                            | Heat Treatment (Condition T HRc 26-32) |
|                         | 190 - 210                            | 190 - 210                            | Turned Bars                            |
|                         | @Thickness >=25.4 mm                 | @Thickness >=1.00 in                 |  |
| Tensile Strength        | 190 - 240                            | 190 - 240                            | Cold Drawn Bars                        |
|                         | @Thickness <=25.4 mm                 | @Thickness <=1.00 in                 |  |
|                         | 889 - 1030 MPa                       | 129000 - 150000 psi                  | Heat Treatment (Condition T HRc 26-32) |
| Tensile Strength, Yield | 621 - 758 MPa                        | 90000 - 110000 psi                   | Turned Bars                            |
|                         | @Thickness >=25.4 mm                 | @Thickness >=1.00 in                 |  |
|                         | 621 - 827 MPa                        | 90000 - 120000 psi                   | Cold Drawn Bars                        |
| Tensile Strength, Yield | 758 - 896 MPa                        | 110000 - 130000 psi                  | Heat Treatment (Condition T HRc 26-32) |
|                         | @Strain 0.200 %                      | @Strain 0.200 %                      |  |
|                         | 448 - 586 MPa                        | 65000 - 85000 psi                    | Turned Bars                            |
|                         | @Strain 0.200 %, Thickness >=25.4 mm | @Strain 0.200 %, Thickness >=1.00 in |  |
|                         | 552 - 724 MPa                        | 80000 - 105000 psi                   | Cold Drawn Bars                        |

| Mechanical Properties | Metric<br>@Strain 0.200 %,<br>Thickness <=25.4 mm | English<br>@Strain 0.200 %,<br>Thickness <=1.00 in | Comments                               |
|-----------------------|---|--|--|
| Elongation at Yield   | >= 40 %   | >= 40 %  | Heat Treatment (Condition T HRc 26-32) |
|                       | >= 10 %<br>@Thickness <=25.4 mm                   | >= 10 %<br>@Thickness <=1.00 in                    | Cold Drawn Bars                        |
|                       | >= 20 %<br>@Thickness >=25.4 mm                   | >= 20 %<br>@Thickness >=1.00 in                    | Turned Bars                            |
| Reduction of Area     | >= 5.0 %  | >= 5.0 %   | Heat Treatment (Condition T HRc 26-32) |
|                       | >= 40 %<br>@Thickness <=25.4 mm                   | >= 40 %<br>@Thickness <=1.00 in                    | Cold Drawn Bars                        |
|                       | >= 60 %<br>@Thickness >=25.4 mm                   | >= 60 %<br>@Thickness >=1.00 in                    | Turned Bars                            |
| Modulus of Elasticity | 205 GPa   | 29700 ksi  | Tension                                |

| Thermal Properties   | Metric   | English  | Comments |
|----------------------|--|--|----------|
| CTE, linear          | 10.8 $\mu\text{m}/\text{m}\cdot\text{Å}^\circ\text{C}$<br>@Temperature 20.0 - 200 $\text{Å}^\circ\text{C}$ | 6.00 $\mu\text{in}/\text{in}\cdot\text{Å}^\circ\text{F}$<br>@Temperature 68.0 - 392 $\text{Å}^\circ\text{F}$ |          |
| Thermal Conductivity | 24.9 W/m-K<br>@Temperature 20.0 $\text{Å}^\circ\text{C}$   | 173 BTU-in/hr-ft $\text{Å}^2\cdot\text{Å}^\circ\text{F}$<br>@Temperature 68.0 $\text{Å}^\circ\text{F}$       |          |

| Component Elements Properties | Metric     | English    | Comments |
|-------------------------------|------------|------------|----------|
| Carbon, C                     | <= 0.15 %  | <= 0.15 %  |          |
| Chromium, Cr                  | 12 - 14 %  | 12 - 14 %  |          |
| Copper, Cu                    | <= 0.50 %  | <= 0.50 %  |          |
| Iron, Fe                      | >= 81.84 % | >= 81.84 % |          |
| Manganese, Mn                 | <= 1.25 %  | <= 1.25 %  |          |
| Molybdenum, Mo                | <= 0.60 %  | <= 0.60 %  |          |
| Phosphorous, P                | <= 0.060 % | <= 0.060 % |          |
| Silicon, Si                   | <= 1.0 %   | <= 1.0 %   |          |
| Sulfur, S                     | >= 0.15 %  | >= 0.15 %  |          |

| Component Elements Properties | Metric | English | Comments |
|-------------------------------|--------|---------|----------|
|-------------------------------|--------|---------|----------|

| Electrical Properties  | Metric           | English          | Comments |
|------------------------|------------------|------------------|----------|
| Electrical Resistivity | 0.0000559 ohm-cm | 0.0000559 ohm-cm |          |

| Processing Properties   | Metric                                   | English                               | Comments                 |
|-------------------------|--|---------------------------------------|--------------------------|
| Annealing Temperature   | 649 - 760 Â°C                            | 1200 - 1400 Â°F                       | Sub-critical anneal      |
|                         | 899 Â°C                                  | 1650 Â°F                              | Softest Properties       |
|                         | <= 593 Â°C<br>@Time 14400 - 25200<br>sec | <= 1100 Â°F<br>@Time 4.00 - 7.00 hour | Hold for time, slow cool |
| Hot-Working Temperature | 801.7 Â°C                                | 1475 Â°F                              | Slow heating             |
|                         | 954 - 1180 Â°C                           | 1750 - 2150 Â°F                       | Forging range            |
|                         | 1150 - 1180 Â°C                          | 2100 - 2150 Â°F                       | Then more rapidly        |

| Descriptive Properties | Value            | Comments |
|------------------------|------------------|----------|
| Corrosion Resistance   | Humidity         | 2/4      |
|                        | Sodium Carbonate | 2/4      |

## 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