



UNITED STATES WELDING CORPORATION

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|--|---|---|---|-------------------------|-----------|---------------------|------------------------------|---------------------|-------------|---|---|---------------------|----------|--------------------------------------|------|-------------------------------|------|--|----------|---|------|-------------|---|--------------------------|----------|--|------|------------|---|-------|-------|---|-------|--------|-------|-------|--------|---|------|--------|-------|-------|------|--|---------|
| <p align="center">USW ALLOY DESIGNATION AND DESCRIPTION</p> | <p align="center">TURBALOY[®] 909 MC-GRADE GTAW SOLID BARE WELDING WIRE IRON BASE</p> | <p align="center">ISSUED JANUARY 2007</p> | <p align="center">DATA SHEET 5802 (20)</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p align="center">CROSS-REFERENCE CONFORMANCE SPECIFICATIONS</p> | <table border="0"> <tr> <td>AMS 5802</td> <td>USWC 5802</td> </tr> <tr> <td>GE B50T F215</td> <td>41Fe 37.5Ni 14Co 4.8Cb 1.5Ti</td> </tr> <tr> <td>UNS N19907</td> <td>Incoloy 909</td> </tr> </table> | | | AMS 5802 | USWC 5802 | GE B50T F215 | 41Fe 37.5Ni 14Co 4.8Cb 1.5Ti | UNS N19907 | Incoloy 909 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| AMS 5802 | USWC 5802 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GE B50T F215 | 41Fe 37.5Ni 14Co 4.8Cb 1.5Ti | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| UNS N19907 | Incoloy 909 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p align="center">METALLURGICAL BACKGROUND INFORMATION</p> | <p>TURBALOY[®] 909 is produced by vacuum induction melting and remelting techniques. The final wire is manufactured by special lubricant-free, roller-die forming followed by surface abrasion and cleaning processes.</p> <p>These manufacturing processes ensure consistent metallurgical integrity of the alloy with regard to control of trace elements and physical purity of the welding wire surface.</p> <p>TURBALOY[®] 909 is a Ni-Fe-Co precipitation hardening alloy producing high strength but low thermal expansion characteristics which makes it ideal for certain gas turbine and rocket components.</p> <p>TURBALOY[®] 909 is used to weld base metal of similar composition.</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p align="center">MATERIALS TO BE WELDED AND APPLICATIONS</p> | <p>UNS N19907. AMS 5884, 5892 IN 909.</p> <p>Largely replaces IN 903 (AMS 5806) for many welding applications.</p> <p>The MC-GRADE 909 helps minimize susceptibility to hot crack formation and in this respect is preferred to AMS 5806.</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p align="center">WIRE CHEMISTRY WT%</p> | <table border="0"> <tr> <td>Carbon</td> <td>-</td> <td>0.06</td> <td>Columbium</td> <td>4.30</td> <td>5.20</td> </tr> <tr> <td>Manganese</td> <td>-</td> <td>1.00</td> <td>Titanium</td> <td>1.30</td> <td>1.80</td> </tr> <tr> <td>Silicon</td> <td>0.25</td> <td>0.50</td> <td>Chromium</td> <td>-</td> <td>1.00</td> </tr> <tr> <td>Sulfur</td> <td>-</td> <td>0.010</td> <td>Aluminum</td> <td>-</td> <td>0.20</td> </tr> <tr> <td>Phosphorus</td> <td>-</td> <td>0.015</td> <td>Boron</td> <td>-</td> <td>0.012</td> </tr> <tr> <td>Nickel</td> <td>35.00</td> <td>40.00</td> <td>Copper</td> <td>-</td> <td>0.50</td> </tr> <tr> <td>Cobalt</td> <td>12.00</td> <td>16.00</td> <td>Iron</td> <td></td> <td>Balance</td> </tr> </table> | | | Carbon | - | 0.06 | Columbium | 4.30 | 5.20 | Manganese | - | 1.00 | Titanium | 1.30 | 1.80 | Silicon | 0.25 | 0.50 | Chromium | - | 1.00 | Sulfur | - | 0.010 | Aluminum | - | 0.20 | Phosphorus | - | 0.015 | Boron | - | 0.012 | Nickel | 35.00 | 40.00 | Copper | - | 0.50 | Cobalt | 12.00 | 16.00 | Iron | | Balance |
| Carbon | - | 0.06 | Columbium | 4.30 | 5.20 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Manganese | - | 1.00 | Titanium | 1.30 | 1.80 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Silicon | 0.25 | 0.50 | Chromium | - | 1.00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sulfur | - | 0.010 | Aluminum | - | 0.20 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Phosphorus | - | 0.015 | Boron | - | 0.012 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Nickel | 35.00 | 40.00 | Copper | - | 0.50 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Cobalt | 12.00 | 16.00 | Iron | | Balance | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p align="center">WELD PROPERTIES</p> | <p>Melting Range: 2540° - 2600°F</p> <p align="right">Density: 8.3gm/cc</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p align="center">SIZES AND FORMS AVAILABLE</p> | <table border="0"> <tr> <td align="center" colspan="2">STRAIGHT LENGTHS</td> <td align="center" colspan="2">SPOOLED WIRE</td> </tr> <tr> <td colspan="2">5 lb. (2.2kg) packs</td> <td colspan="2">Precision layer wound, with controlled cast and helix</td> </tr> <tr> <td colspan="2">36" (914mm) lengths</td> <td colspan="2">12" (300mm) diameter spools standard</td> </tr> <tr> <td colspan="2">Flag tagged for traceability.</td> <td colspan="2">8" (200mm), 4" (100mm) and proprietary spool sizes</td> </tr> <tr> <td colspan="2">(Double tagging and other lengths on request)</td> <td colspan="2">on request.</td> </tr> <tr> <td colspan="2">Wide range of diameters.</td> <td colspan="2">Wide range of diameters and spool weights.</td> </tr> </table> | | | STRAIGHT LENGTHS | | SPOOLED WIRE | | 5 lb. (2.2kg) packs | | Precision layer wound, with controlled cast and helix | | 36" (914mm) lengths | | 12" (300mm) diameter spools standard | | Flag tagged for traceability. | | 8" (200mm), 4" (100mm) and proprietary spool sizes | | (Double tagging and other lengths on request) | | on request. | | Wide range of diameters. | | Wide range of diameters and spool weights. | | | | | | | | | | | | | | | | | | | |
| STRAIGHT LENGTHS | | SPOOLED WIRE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| <p align="center">PACKAGING</p> | <p>Sealed polyethylene envelopes. (Desiccants optional)</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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