



# UNITED STATES WELDING CORPORATION

|  |   |       |  |  |  |        |   |      |        |      |      |           |      |      |           |      |      |         |   |      |        |      |      |        |   |       |            |   |      |            |   |       |      |  |         |          |       |       |  |  |  |
|--|---|-------|--|--|--|--------|---|------|--------|------|------|-----------|------|------|-----------|------|------|---------|---|------|--------|------|------|--------|---|-------|------------|---|------|------------|---|-------|------|--|---------|----------|-------|-------|--|--|--|
| <b>USW ALLOY<br/>DESIGNATION<br/>AND<br/>DESCRIPTION</b>   | <b>TURBALOY® 17-4 PH<br/>HQ-GRADE<br/>GTAW SOLID BARE WELDING WIRE<br/>IRON BASE</b>  |       |  | <b>ISSUED</b><br>JANUARY 2007  | <b>DATA SHEET</b><br><br><b>5825</b><br>(30) |        |   |      |        |      |      |           |      |      |           |      |      |         |   |      |        |      |      |        |   |       |            |   |      |            |   |       |      |  |         |          |       |       |  |  |  |
|  |   |       |  | <b>REVISION NO.</b><br>A   |  |        |   |      |        |      |      |           |      |      |           |      |      |         |   |      |        |      |      |        |   |       |            |   |      |            |   |       |      |  |         |          |       |       |  |  |  |
| <b>CROSS-REFERENCE<br/>CONFORMANCE<br/>SPECIFICATIONS</b>  | AMS 5825<br>UNS S17480<br>17-4 PH<br>USWC 5825 (A)<br>16.5Cr 4.8Ni .22Cb 3.6Cu  |       |  | AWS A5.9 ER630 (formerly 327)<br>X5 Cr Ni Cu Nb 17.4<br>AISI 630<br>Available in MC-GRADE (5803)<br>(Note: AMS 5803 is a higher purity version). |  |        |   |      |        |      |      |           |      |      |           |      |      |         |   |      |        |      |      |        |   |       |            |   |      |            |   |       |      |  |         |          |       |       |  |  |  |
| <b>METALLURGICAL<br/>BACKGROUND<br/>INFORMATION</b>        | <p>TURBALOY® 17-4 PH undergoes a series of proprietary abrading and cleaning processes to remove all surface contaminants. These manufacturing processes ensure a consistent ultra-clean weld wire surface.</p> <p>TURBALOY® 17-4 PH is a precipitation hardening martensitic stainless engineering alloy, used to weld similar composition materials. Modified analysis to eliminate ferrite phase.</p>  |       |  |  |  |        |   |      |        |      |      |           |      |      |           |      |      |         |   |      |        |      |      |        |   |       |            |   |      |            |   |       |      |  |         |          |       |       |  |  |  |
| <b>MATERIALS TO BE<br/>WELDED<br/>AND<br/>APPLICATIONS</b> | ASTM A564, A705, A693.<br>AMS 5643, 5622, 5398, 5342-44, 5604, 5529, 5528, 5568.<br>Welds may be used as-welded, welded - aged, or solution treated - aged or depending upon required application and size of the weld. For heavy section and for high restraint, 15/5PH (AMS 5659) will give improved toughness properties.  |       |  |  |  |        |   |      |        |      |      |           |      |      |           |      |      |         |   |      |        |      |      |        |   |       |            |   |      |            |   |       |      |  |         |          |       |       |  |  |  |
| <b>WIRE CHEMISTRY<br/>WT%</b>                              | <table style="width: 100%; border-collapse: collapse;"> <tr> <td>Carbon</td><td>-</td><td>0.05</td><td>Nickel</td><td>4.50</td><td>5.00</td></tr> <tr> <td>Manganese</td><td>0.25</td><td>0.75</td><td>Columbium</td><td>0.15</td><td>0.30</td></tr> <tr> <td>Silicon</td><td>-</td><td>0.75</td><td>Copper</td><td>3.25</td><td>4.00</td></tr> <tr> <td>Sulfur</td><td>-</td><td>0.025</td><td>Molybdenum</td><td>-</td><td>0.75</td></tr> <tr> <td>Phosphorus</td><td>-</td><td>0.025</td><td>Iron</td><td></td><td>Balance</td></tr> <tr> <td>Chromium</td><td>16.00</td><td>16.75</td><td></td><td></td><td></td></tr> </table> |       |  |  |  | Carbon | - | 0.05 | Nickel | 4.50 | 5.00 | Manganese | 0.25 | 0.75 | Columbium | 0.15 | 0.30 | Silicon | - | 0.75 | Copper | 3.25 | 4.00 | Sulfur | - | 0.025 | Molybdenum | - | 0.75 | Phosphorus | - | 0.025 | Iron |  | Balance | Chromium | 16.00 | 16.75 |  |  |  |
| Carbon   | -   | 0.05  | Nickel   | 4.50   | 5.00   |        |   |      |        |      |      |           |      |      |           |      |      |         |   |      |        |      |      |        |   |       |            |   |      |            |   |       |      |  |         |          |       |       |  |  |  |
| Manganese  | 0.25  | 0.75  | Columbium  | 0.15   | 0.30   |        |   |      |        |      |      |           |      |      |           |      |      |         |   |      |        |      |      |        |   |       |            |   |      |            |   |       |      |  |         |          |       |       |  |  |  |
| Silicon  | -   | 0.75  | Copper   | 3.25   | 4.00   |        |   |      |        |      |      |           |      |      |           |      |      |         |   |      |        |      |      |        |   |       |            |   |      |            |   |       |      |  |         |          |       |       |  |  |  |
| Sulfur   | -   | 0.025 | Molybdenum   | -  | 0.75   |        |   |      |        |      |      |           |      |      |           |      |      |         |   |      |        |      |      |        |   |       |            |   |      |            |   |       |      |  |         |          |       |       |  |  |  |
| Phosphorus   | -   | 0.025 | Iron   |  | Balance                                      |        |   |      |        |      |      |           |      |      |           |      |      |         |   |      |        |      |      |        |   |       |            |   |      |            |   |       |      |  |         |          |       |       |  |  |  |
| Chromium   | 16.00   | 16.75 |  |  |  |        |   |      |        |      |      |           |      |      |           |      |      |         |   |      |        |      |      |        |   |       |            |   |      |            |   |       |      |  |         |          |       |       |  |  |  |
| <b>WELD<br/>PROPERTIES</b>                                 | Hardness, aged at 550°C - 330HV (35R <sub>c</sub> )<br><br>Max hardness: R <sub>c</sub> 48<br><br>Density: 7.8gm/cc   |       |  |  |  |        |   |      |        |      |      |           |      |      |           |      |      |         |   |      |        |      |      |        |   |       |            |   |      |            |   |       |      |  |         |          |       |       |  |  |  |
| <b>SIZES<br/>AND<br/>FORMS AVAILABLE</b>                   | STRAIGHT LENGTHS  |       | SPOOLED WIRE   |  |  |        |   |      |        |      |      |           |      |      |           |      |      |         |   |      |        |      |      |        |   |       |            |   |      |            |   |       |      |  |         |          |       |       |  |  |  |
|  | 5 lb. (2.2kg) packs<br>36" (914mm) lengths<br>Flag tagged for traceability.<br>(Double tagging and other lengths on request)<br>Wide range of diameters.  |       | Precision layer wound, with controlled cast and helix<br>12" (300mm) diameter spools standard<br>8" (200mm), 4" (100mm) and proprietary spool sizes<br>on request.<br>Wide range of diameters and spool weights. |  |  |        |   |      |        |      |      |           |      |      |           |      |      |         |   |      |        |      |      |        |   |       |            |   |      |            |   |       |      |  |         |          |       |       |  |  |  |
| <b>PACKAGING</b>   | Sealed polyethylene envelopes. (Desiccants optional)  |       |  |  |  |        |   |      |        |      |      |           |      |      |           |      |      |         |   |      |        |      |      |        |   |       |            |   |      |            |   |       |      |  |         |          |       |       |  |  |  |

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