**NEW GENERATION GMA WELDING WIRE**

- Superior welding wire
- Trouble-free wire feeding

**AS SG2-CF** and **AS SG3-CF** non copper coated gas metal arc welding wires provide higher productivity with improved weld quality and reduce overall welding costs.
**Copper Free** range is the non copper coated version of AS SG2 and AS SG3 gas metal arc welding wire with higher performance. Regardless of welding operations; manual, mechanised or robotic (full automatic), AS SG2-CF and AS SG3-CF wires offer significant improvements in quality and productivity due to special surface production process; Smooth Surface Technology (SST).

In contrary to often claimed, copper coating is used with a purpose to improve wire feeding. It does not have any effect on corrosion resistance or on conductivity. Weak point of copper coating is that the copper is a weak alloy and it may suffer from mechanical damage during feeding. In course of feeding, it breaks off and begins to contaminate the feeding units. As long as the process is sustained, such chip off gradually causes obstructions in spiral, torch and contact nozzle. Such a situation produces a resistance in wire feeding and eventually stops the welding process due to burnback. Non copper coating does not cause any obstructions due to copper failures and ensures a high quality production with trouble free wire feeding, high arc stability.

Range of non-copper coated wires with SST is developed and applied after long time of research and development studies. Smooth Surface Technology has a number of superior features with advantages compared to copper coated wires which are listed in Table 1.

*(SST) Smooth Surface Technology; wire feeding performance without trouble for a longer time.*
Gas Metal Arc Welding Wire for Un-Alloyed Steels

Table 1. Benefits of Askaynak’s Non-Copper Coated Range.

<table>
<thead>
<tr>
<th>Properties</th>
<th>Advantages</th>
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<tbody>
<tr>
<td>Consistent welding performance</td>
<td>Uniform weld bead appearance</td>
</tr>
<tr>
<td>Stable arc with lower feeding force</td>
<td>High weld quality, reduced rework or post weld cleaning</td>
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<tr>
<td>Excellent arc ignition</td>
<td>Reduced post weld cleaning</td>
</tr>
<tr>
<td>Trouble free wire feeding</td>
<td>Higher productivity, reduced downtime, longer spiral and contact tip life without clogging.</td>
</tr>
<tr>
<td>Low fume emission</td>
<td>Healthier working environment.</td>
</tr>
</tbody>
</table>

In ASKAYNAK’s test and research department, AS SG2-CF and AS SG3-CF was compared with a selection of copper coated MIG wires from a different supplier in the market. Unstable feeding results an unstable arc with more spatter and less straight weld beads. As it is seen from the below mentioned graphic, feeding force which is needed to push a wire through a liner and torch shows that feeding force is not only lower for CF but also more stable for CF range than usual copper coated wires.

For arc stability, current variance of copper coated is pronounced clearly due to less stable arc.

Results of Wire Feeding Force and Current Variations

AS SG2-CF and AS SG3-CF products are available in spools of 15 kg and in drums of 250 kg to provide a continuous welding for automation welding.

<table>
<thead>
<tr>
<th>Diameter</th>
<th>1.0 mm</th>
<th>1.2 mm</th>
<th>1.6 mm</th>
<th>Spool</th>
<th>Drum</th>
</tr>
</thead>
<tbody>
<tr>
<td>GMAW</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>15 kg</td>
<td>250 kg</td>
</tr>
</tbody>
</table>
**AS SG2-CF**

AS MIG SG2-CF is suitable for GMA welding of mild structural steels with a tensile strength up to 540N/mm², ship plates and fine-grained C-Mn steels. It gives high-strength weld metal at working temperatures varying between –50 and 450°C. CO₂ or 80 % Ar + 20 % CO₂ are used for gas shielding.

**Classification**
- TS EN ISO 14341-A : G 42 3 C 3Si1 / G 42 5 M 3Si1
- AWS A5.18 : ER70S-6

**Chemical Composition (W%), Typical, Wire**
- C : 0.08
- Si : 0.85
- Mn : 1.50

**Typical weld metal composition (CO₂ gas shielding)**
- C : 0.06
- Si : 0.55
- Mn : 1.10

**Mechanical Properties, Typical, All Weld Metal**
- Yield Strength : 440 N/mm²
- Tensile Strength : 540 N/mm²
- Elongation (L=5d) : 30 %
- Impact (ISO-V) : 60 J (–50°C)

**Shielding Gases (ISO 14175 / EN 439)**
- MIG : M21 - Ar + %5-25 CO₂
- C1 - CO₂ (%100)

**AS SG3-CF**

AS SG3-CF is non-copper-coated gas metal arc welding wire in 15 kg spools or 250 kg drums. It is particularly designed for semi-automatic and full-automatic GMAW applications. Working temperature can range between –50 to 450°C. CO₂ or 80 % Ar + 20 % CO₂ are used for gas shielding.

**Classification**
- TS EN ISO 14341-A : G 42 3 C 3Si1 / G 42 5 M 3Si1
- AWS A5.18 : ER70S-6

**Chemical Composition (W%), Typical, Wire**
- C : 0.08
- Si : 1.00
- Mn : 1.70

**Typical weld metal composition (CO₂ gas shielding)**
- C : 0.06
- Si : 0.60
- Mn : 1.20

**Mechanical Properties, Typical, All Weld Metal**
- Yield Strength : 470 N/mm²
- Tensile Strength : 570 N/mm²
- Elongation (L=5d) : 25 %
- Impact (ISO-V) : 60 J (–50°C)

**Shielding Gases (ISO 14175 / EN 439)**
- MAG : M21 - Ar + %5-25 CO₂
- C1 - CO₂ (%100)