Workshop Productivity Improvement

METAL CORED WIRE SERIES

welding.com.au
1300 300 884
WIA’s Filler Metal Specialists

EXPERTS IN THEIR FIELD!

WIA’s Filler Metal Specialists have the qualifications, experience and knowledge that can be relied on to deliver the best results.

Using a Solid MIG or Flux Cored wire? Implementing a Metal Cored wire can offer productivity and quality benefits plus so much more. Consider the change and call one of our Filler Metal Specialists today.

Our specialists will work closely with you, manage the entire testing process, and recommend a selection that will offer the best results for your application.
WIA’s Filler Metal Specialists have completed extensive in-house testing on Metal Cored, Flux Cored, and Solid MIG wires. The results are in and can be seen below.

**Deposition Testing - Metal Cored vs Flux Cored & Solid Wires**

- Metal cored wire has an average 20% increase in deposition compared to flux cored wires.
- Metal cored wire has the same deposition rate as flux cored, however, uses lower Amps.
- Using lower Amps, metal cored wire produces an average 20% increase in deposition.
- Higher Amps produce higher deposition rates.

**Deposition Testing - 1% Ni Metal Cored vs Flux Cored & Solid Wires**

- Metal cored wire can offer 8.9 kg/hr at 450 Amps.
- 1.6mm metal cored wire can offer 8.9 kg/hr at 450 Amps.
Application Testing

Our Filler Metal Specialists have worked with industry to test and compare the performance of Solid MIG and Flux Cored wires vs Metal Cored wires for various applications. Results prove that Metal Cored wires provide a number of benefits that improve productivity and overall results.

<table>
<thead>
<tr>
<th>APPLICATION TESTED</th>
<th>SOLID MIG WIRE CONCERNS</th>
<th>METAL CORED WIRE TESTED</th>
<th>RESULTS</th>
<th>ADDITIONAL BENEFITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beam and Lintel</td>
<td>Distortion and travel speed</td>
<td>FabCOR 86R</td>
<td>Minimised distortion and increased travel speed</td>
<td>Suitable for automatic beam production line</td>
</tr>
<tr>
<td>Trailer manufacturer</td>
<td>Full weld penetration requirement</td>
<td>FabCOR Edge Ni1</td>
<td>Increased penetration</td>
<td>Increased welding procedure and operator qualification pass rate</td>
</tr>
<tr>
<td>Thin sheet to structural steel</td>
<td>Spatter</td>
<td>FabCOR 86R</td>
<td>Eliminated spatter</td>
<td>Increased travel speed and reduced burn through</td>
</tr>
</tbody>
</table>

BEAM & LINTEL

<table>
<thead>
<tr>
<th>FILLER METAL TESTED</th>
<th>FabCOR 86R</th>
</tr>
</thead>
<tbody>
<tr>
<td>JOINT TYPE</td>
<td>Automated Fillet Welds</td>
</tr>
</tbody>
</table>

PROBLEM

Using solid MIG wires caused high camber and sweep distortion of the application. Camber distortion equalled 6mm over 6m while the sweep distortion equalled 8-10mm over 6m. Heavy mill scale and rust surface caused surface porosity.

RESULTS

Both camber and sweep distortion was reduced to the requested 3mm over 6m. Travel speeds were also increased, and flame heating labour costs were reduced. Eliminated porosity and rework which was originally caused by surface defects.
# TRAILER MANUFACTURING

<table>
<thead>
<tr>
<th>FILLER METAL TESTED</th>
<th>FabCOR Edge Ni1</th>
</tr>
</thead>
<tbody>
<tr>
<td>JOINT TYPE</td>
<td>Fillet Weld and Butt Welds</td>
</tr>
<tr>
<td>PROBLEM</td>
<td>The use of solid MIG wires did not meet penetration weld requirements. The customer also trialled flux cored wire hoping to increase productivity, but the penetration profile had no significant improvement at down hand position.</td>
</tr>
<tr>
<td>RESULTS</td>
<td>Penetration was increased to meet weld requirements. The improved penetration dramatically improved welding procedure and operator qualification pass rate.</td>
</tr>
</tbody>
</table>

# THIN SHEET TO STRUCTURAL STEEL

<table>
<thead>
<tr>
<th>FILLER METAL TESTED</th>
<th>FabCOR 86R</th>
</tr>
</thead>
<tbody>
<tr>
<td>JOINT TYPE</td>
<td>Fillet and Lap Welds</td>
</tr>
<tr>
<td>PROBLEM</td>
<td>Using solid MIG wires produced excessive spatter. Potential burn through at higher Amperage setting.</td>
</tr>
<tr>
<td>RESULTS</td>
<td>Spatter was eliminated over mill scale surface. Spray transfer was performed without the risk of burn through. Non-productive cleaning activity was eliminated.</td>
</tr>
</tbody>
</table>
Metal Cored Gas Shielded Wire

**FabCOR 86R**

A Metal Cored Wire with Higher Deoxidization Elements.

**Classifications**
- AS/NZS ISO 17632-B - T494T15-0MA-UH5
- AWS A5.18: E70C-6M H4

**Mechanical Tests 75% Ar/25% CO₂**
- Tensile Strength: 558 MPa
- Yield Strength: 476 MPa
- Elongation: 30%
- CVN Impact Values:
  - @ -30°C: 101 J
  - @ -40°C: 54 J

**CVN Temperatures 75% Ar/25% CO₂**
- @ -45°C: 60 Joules

**Ordering Information**
- Wire Size (MM)
  - 1.2: 15kg Spool S249412-029
  - 1.2: 227kg X-Pak S249412-050
  - 1.6: 15kg Spool S249419-029

**Productivity Gain**
- Improves productivity compared to solid wire or flux-cored electrodes.
- Reduces clean-up time, improves productivity.
- Excellent for robotic welding.
- Improved operator appeal, assists in maintaining consistent weld quality.
- Minimises risk of hydrogen-induced cracking.
- Improves operator appeal and productivity.
- Promotes versatility in procedure development.

**Typical Applications**
- Suitable for automatic and mechanised welding, storage vessels, non-alloyed and fine grain steels, steel structures, earthmoving, equipment, general fabrication, shipbuilding, rail cars.

**Metal Cored Wire**
A metal cored wire with higher deoxidization elements allow this wire to have greater tolerance for mill scale welding applications. Single and multiple pass applications.

**High Deposition Rates and Efficiencies**
- Virtually no slag coverage.
- Outstanding high-production performance.
- Smooth arc characteristics.
- Low diffusible hydrogen weld deposit.
- Low smoke and spatter levels.
- Excellent for both CV and pulsed welding.

**Composition**
<table>
<thead>
<tr>
<th>C</th>
<th>Mn</th>
<th>Si</th>
<th>S</th>
<th>P</th>
<th>Fe</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.03</td>
<td>1.44</td>
<td>0.67</td>
<td>0.015</td>
<td>0.008</td>
<td>Bal</td>
</tr>
</tbody>
</table>

**Classifications**
- AS/NZS ISO 17632-B - T494T15-0MA-UH5
- AWS A5.18: E70C-6M H4
METAL CORED FLUX-CORED WIRE

FabCOR Edge Ni1

METAL CORED WIRE WITH HIGHER DEPOSITION RATES & TRAVEL SPEEDS THAN SOLID WIRE.

CLASSIFICATIONS
➢ AS/NZS ISO 17632-B · T554T15-OMA-N1-UH5
➢ AWS A5.28: E80C-Ni1 H4

TYPICAL APPLICATIONS
Suitable for heavy fabrication and mining applications, high strength low-alloy steels, single or multi-pass welding, structural fabrications, nickel-molybdenum steels, heavy equipment and weathering steels.

LOW ALLOY METAL CORED WIRE
➢ Virtually no silicon deposits at weld bead toe lines.
➢ Excellent gap bridging capabilities.
➢ Higher deposition rates and travel speeds than solid wire.
➢ Good impact toughness at low temperature.

PRODUCTIVITY GAIN
➢ Reduces clean-up time, minimises risk of inclusions.
➢ Minimises burn-through, reduces part rejection.
➢ Increases productivity, more parts per hour.
➢ Resists cracking in severe applications.

TYPICAL DIFFUSIBLE HYDROGEN*

HYDROGEN EQUIPMENT 75% Ar/25% CO₂
Gas Chromatography 2.1 ml/100g

MECHANICAL TESTS 75% Ar/25% CO₂
Tensile Strength 586 MPa (85,000 psi)
Yield Strength 503 MPa (73,000 psi)
Elongation 25%
CVN Impact Values 60J @ -45°C

CVN TEMPERATURES 75% Ar/25% CO₂
-45°C 60 Joules

C Mn Si S P Ni Fe
0.05 1.10 0.57 0.011 0.013 1.0 Bal

ORDERING INFORMATION

<table>
<thead>
<tr>
<th>WIRE SIZE (MM)</th>
<th>PACKET SIZE AND TYPE</th>
<th>PART NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.2</td>
<td>15kg Spool</td>
<td>S279512-029</td>
</tr>
<tr>
<td>1.6</td>
<td>15kg Spool</td>
<td>S279519-029</td>
</tr>
</tbody>
</table>

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Call our Filler Metal Specialist Team Today

Contact our Customer Support Team, or visit our website to find your local specialist.

1300 300 884
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