

## Atom Arc 12018

Atom Arc 12018 is recommended for use in fabrication of low-alloy, high tensile steels where welds of 120 ksi (830 MPa) minimum tensile strength are required. Atom Arc 12018 is typically used to weld forging, casting plate and pressure vessels.

| Specifications         |                                                                                  |
|------------------------|----------------------------------------------------------------------------------|
| <b>Classifications</b> | ASME SFA 5.5 : E12018M H4R<br>AWS A5.5 : E12018M H4R                             |
| <b>Industry</b>        | Automotive<br>Industrial and General Fabrication<br>Railcars<br>Mobile Equipment |

|                            |                                            |
|----------------------------|--------------------------------------------|
| <b>Welding Current</b>     | AC, DC+                                    |
| <b>Diffusible Hydrogen</b> | < 4.0 ml/100g                              |
| <b>Alloy Type</b>          | Low alloyed (1.7% Ni - 0.6% Cr - 0.23% Mo) |

| Typical Tensile Properties                      |                     |                     |            |
|-------------------------------------------------|---------------------|---------------------|------------|
| Condition                                       | Yield Strength      | Tensile Strength    | Elongation |
| Stress Relieved<br>1 hour(s) 740 °C ( 1364 °F ) | 808 MPa ( 117 ksi ) | 898 MPa ( 130 ksi ) | 21 %       |
| As Welded                                       | 830 MPa ( 120 ksi ) | 920 MPa ( 133 ksi ) | 18 %       |

| Typical Charpy V-Notch Properties |                     |                   |
|-----------------------------------|---------------------|-------------------|
| Condition                         | Testing Temperature | Impact Value      |
| Stress Relieved                   | -50 °C ( -58 °F )   | 53 J ( 39 ft-lb ) |
| As Welded                         | -51 °C ( -60 °F )   | 35 J ( 26 ft-lb ) |

| Typical Weld Metal Analysis % |      |      |      |      |      |      |      |       |       |
|-------------------------------|------|------|------|------|------|------|------|-------|-------|
| C                             | Mn   | Si   | S    | P    | Ni   | Cr   | Mo   | V     | Cu    |
| 0.047                         | 1.88 | 0.35 | 0.01 | 0.01 | 1.94 | 0.63 | 0.23 | 0.010 | 0.092 |

| Typical Weld Metal Analysis % |  |
|-------------------------------|--|
| <b>Nb</b>                     |  |
| 0.005                         |  |

| Deposition Data                       |           |         |                           |                          |                             |
|---------------------------------------|-----------|---------|---------------------------|--------------------------|-----------------------------|
| Diameter                              | Current   | Voltage | Deposition Efficiency (%) | Burn-off Time /Electrode | Deposition Rate @ 90% I max |
| 2.4 x 356.0 mm<br>( 3/32 x 14.0 in. ) | 70-110 A  | 23.2 V  | 69.01 %                   | 60 sec                   | 0.92 kg/h<br>( 2.0 lbs/h )  |
| 3.2 x 356.0 mm<br>( 1/8 x 14.0 in. )  | 90-160 A  | 23.9 V  | 72.23 %                   | 70 sec                   | 1.36 kg/h<br>( 3.0 lbs/h )  |
| 4.0 x 356.0 mm<br>( 5/32 x 14.0 in. ) | 130-220 A | 24.3 V  | 72.06 %                   | 75 sec                   | 1.89 kg/h<br>( 4.2 lbs/h )  |
| 4.8 x 356.0 mm<br>( 3/16 x 14.0 in. ) | 200-300 A | 24.3 V  | 71.04 %                   | 74 sec                   | 2.53 kg/h<br>( 5.6 lbs/h )  |
| 6.4 x 457.0 mm<br>( 1/4 x 18.0 in. )  | 300-400 A | 25.5 V  | 77.06 %                   | 103 sec                  | 4.22 kg/h<br>( 9.3 lbs/h )  |