

## TEST RESULTS

### INTENDED FOR INFORMATION ONLY

(Applies only to U.S. products)

This is to state that **SuperArc® L-59®** electrode was tested under the following GMAW welding conditions.

Operating Settings	Results
Electrode Size (inches)	0.045
Polarity	DC+
Shielding Gas (per AWS A5.32)	75% Ar/25% CO <sub>2</sub> (M21-ArC-75/25)
Voltage V	30
Wire Feed Speed cm/min (in/min)	1092 (430)
Current amps	285
Contact Tip to Work Distance mm (in.)	19 (3/4)
Travel Speed , cm/min (in/min)	36 (14)
Passes/Layers	16/6
Preheat Temp °C (°F)	20 (70)
Interpass Temp °C (°F)	150 (300)

**Mechanical properties** of the weld deposit (in the as-welded condition) were as follows:

Tensile Strength MPa (ksi)	560 (82)
Yield Strength, 0.2% offset MPa (ksi)	4650 (65)
Elongation (%)	28
Average Hardness Rockwell B	86
<b>Charpy V-notch Impact Properties Avg.</b>	<b>1906 (78)</b>
Joules @ -40 °C (ft-lbf @ -40 °F)	90,110,117 (49,50,58)
<b>Charpy V-notch Impact Properties Avg.</b>	<b>70 (52)</b>
Joules @ -29 °C (ft-lbf @ -20 °F)	66,67,78 (66,71,71)


**Chemical composition**

(weight %)	Electrode	Deposit
C	0.07	0.08
Mn	1.45	1.13
Si	0.82	0.63
S	0.021	0.021
P	0.010	0.011
Cr	0.04	0.05
Ni	0.02	0.02
Mo	0.01	0.01
V	0.00	0.00
Cu (Total)	0.18	0.18

Test assembly constructed of ASTM A36 steel. Joint design per AWS A5.18-2005.

Charpy Impact averages calculated per AWS A5.18.

Results below the detection limits of the instrument or lower than the precision required by specification are reported as zero. Strength values in SI units are reported to the nearest 10 MPa converted from actual data. Preheat and interpass temperature values in SI units are reported to the nearest 5 degrees.

 20 MAY 2016  
Marie A. Quintana, Director, Consumable Compliance,  
Consumable R&D Department, Date

 5/25/16  
Toronto Cunningham,  
Certification Supervisor, Date

**SuperArc® L-59®**  
**TEST RESULTS PROVIDED FOR INFORMATION ONLY**

This is to state that SuperArc® L-59® produced the results summarized below when tested under the conditions reported.

**GMAW Operating Conditions**

Electrode Size, in.	0.045
Current Type & Polarity	DC+
Welding Position	1G - Flat
Shielding Gas Type	75% Ar 25% CO2
Shielding Gas Flow Rate, L/min. (cfh)	20 (43)
Contact Tip to Work Distance, mm (in.)	19 (0.75)
Nominal Voltage, V	30
Nominal Current, A	285
Average Travel Speed, cm/min (in/min)	36 (14)
Average Heat Input, kJ/mm (kJ/in)	1.4 (36)
Preheat Temperature, °C (°F)	21 (70)
Interbead Temperature, °C (°F)	149 (300)
Number of Passes / Layers	16 / 6
PWHT or As-Welded	As-Welded

**Chemical Tests**

<i>Element</i>	<i>Weld Metal (wt. %)</i>	
C	0.07	0.08
Mn	1.45	1.13
Si	0.82	0.63
S	0.021	0.021
P	0.01	0.011
Ni	0.02	0.02
Cr	0.04	0.05
Mo	0.01	0.01
V	0.002	0.002
Cu	NA	0.18
Cu (total)	0.18	NA

**Mechanical Tests**

<i>All Weld Metal Properties</i>	
Yield Strength @ 0.2% offset, MPa (ksi)	450 (65)
Ultimate Tensile Strength, MPa (ksi)	560 (82)
Elongation, %	28
Charpy V-Notch Impact Strength J (ft-lbf)	
-40°C (-40°F)	28, 66, 67, 78, 82 (21, 49, 50, 58, 61)
-20°C (-29°F)	68, 89, 95, 96, 103 (51, 66, 71, 71, 76)
<i>Transverse Tensile Tests</i>	
Ultimate Tensile Strength, MPa (ksi)	NA
Fracture Location	
<i>Guided Bend Tests</i>	
Side Bend	NA
Face Bend	NA
Root Bend	NA

**NOTES:**

NA indicates that the test is not applicable or that data is not available.  
 Results below the detection limit of the instrument or below the level of precision indicated are reported as zero.  
 Strength values in SI units are reported to the nearest 10 MPa.  
 Test assembly fabricated in accordance with American Welding Society A5.18-2005.

Marie A. Quintana  
 Director, Consumable Compliance, Date

Toronto Cunningham  
 Certification Supervisor, Date