

**1. CONDUCTOR**

Material: Silicone Blocked Bare Copper (SBB)  
 Construction: See Table 1  
 Diameter: See Table 1

**2. INSULATION**

Material: Crosslinked Polyethylene  
 Wall Thickness: See Table 1  
 Diameter: See Table 1  
 Color Standard: SAE  
 Marking: None

**3. PHYSICAL CHARACTERISTICS**

Temperature Rating: -40 °C to 125 °C  
 Voltage: 60 V  
 Weight: See Table 1

**4. PERFORMANCE PROPERTIES**  
**INSULATION**

**Mechanical**

Abrasion Resistance  
 Sandpaper See Table 2  
 Scrape See Table 2  
 Adhesion TBD  
 Column Strength  $\leq 0.50 \text{ mm}^2$  15 N, min.

**Electrical**

Dielectric Strength 1000 V, 60 Hz, 60 s  
 Voltage Withstand 1000 V, 60 Hz, 30 min  
 <  $0.50 \text{ mm}^2$  500 V/s Increase to 3000  $V_{ac}$   
 $\geq 0.50 \text{ mm}^2$  500 V/s Increase to 5000  $V_{ac}$   
 Spark Test  
 <  $0.50 \text{ mm}^2$  3000  $V_{ac}$   
 $\geq 0.50 \text{ mm}^2$  5000  $V_{ac}$   
 Insulation Volume Resistivity  $10^9 \Omega\text{-mm}$ , min.  
 Conductor  
 DC Resistance See Table 2  
 Theoretical Ampacity (Industry Standard Calculation) See Table 3

**Thermal**

Short-term Aging (240 hr @ 150 °C)  
 No Cracks, Pass Dielectric Strength  
 Long-term Aging (3000 hr @ 125 °C)  
 No Cracks, Pass Dielectric Strength  
 Thermal Overload (6 hr @ 175 °C)  
 No Cracks, Pass Dielectric Strength  
 Flame Resistance (45°) 70 s Burn, max.  
 Low Temperature Winding (4 hr @ -40 °C)  
 No Cracks, Pass Dielectric Strength  
 Low Temperature Impact (4 hr @ -15 °C)  
 Pass Impact Test, Pass Dielectric Strength Test  
 Shrinkage (15 min @ 150 °C) 2 mm, max.  
 Hot Water Resistance  
 (35 days @ 85 °C, 10 g/L Salt Solution)  
 Insulation Volume Resistivity  $10^9 \Omega\text{-mm}$ , min.  
 High Temperature Pressure Test (4 hr @ 125 °C)  
 Pass Dielectric Strength

**PERFORMANCE PROPERTIES (Cont'd)**

Thermal Stability in a Wound State (1 hr @ 175 °C)  
 No Cracks, Pass Withstand 1 kV/60 s

**Chemical**

Ozone Resistance (192 hr @ 65 °C) 1 ppm Ozone  
 No Cracks  
 Fluid Compatibility O.D. Change, max.  
 Pass Dielectric after Immersion  
 Engine Oil (IRM 902) 15%  
 Gasoline (Ref. Fuel C) 15%  
 Ethanol / Ref. Fuel C Mixture 15%  
 Diesel Fuel 15%  
 Power Steering (IRM 903) 30%  
 Auto Trans. (Dexron VI) 25%  
 Engine Coolant 50/50 15%  
 Battery Acid (Sp. Gr. ~ 1.26) 5%  
 Temperature/Humidity Cycling  
 No Visible Conductor, Pass Dielectric Strength

**Flex Fuel Compatibility (WSS-M1L123-A4)**  
 168 hr @ 60 °C

O.D. Change, max.  
 After Immersion/After Dry-out  
 C[E10] +10% / -6%  
 C[E85] +10% / -6%  
 C[M15] +10% / -6%  
 AUS 32 +10% / -6%  
 Mandrel Wrap No Cracks  
 Dielectric Strength No Breakdown  
 Mechanical (Post Dry-out)  
 Tensile Strength 80% retention, min.  
 Elongation 50% retention, min.

**Resistance to Fuels (GMW16848)**  
 960 hr @ 60 °C

O.D. Change, max.  
 After Immersion/After Dry-out  
 E25 +10% / -6%  
 Oxidized Gasoline +10% / -6%  
 E85 +10% / -6%  
 E100 +10% / -6%  
 Mandrel Wrap No Cracks  
 Dielectric Strength No Breakdown

**Anticapillary Action**

Fill 6 test tubes to 25 mm with dyed AUS 32. From the sample, cut 6 specimens to 142 mm with 10 mm stripped on each end and place a specimen in each tube with the stripped end submerged. Connect one end of each specimen to the vacuum and apply a vacuum of 100 mm Hg to each specimen for 1 hr. (See Fig. 1) Remove each specimen and allow it to dry. After the outside of the specimens are dry, slice off insulation for evidence of wicking up the conductor and/or inside surface of the insulation. Fluid shall not travel up the conductor more than 20 mm.



**JUDD WIRE INC.**  
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Date	Rev	By	Appr'd	ECN
04/27/12	---	RMB	RTB	---
10/14/16	K	CMS	RMB	16-1760
05/01/18	L	RTB	RMB	18-1922
Customer Approval:				

Description: <b>HOOKUP, SBB, THIN WALL, XLPE, 125°C, 60V, G12, GAS TANK</b>	
Specification Number: <b>JW1416-12</b>	Page: 1 of 3

**PERFORMANCE PROPERTIES (Cont'd)**

**5. PROCEDURAL REFERENCE SPECIFICATIONS**

ISO 6722-1  
 GMW15626 (November 2012)  
 GMW16848 (August 2011 Draft)  
 WSS-M1L123-A4

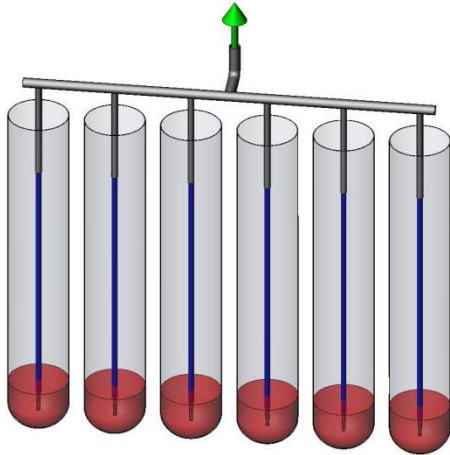


Fig.1. Anticapillary Test Set Up

Conductor		Insulation					
ISO Conductor Size (mm <sup>2</sup> )	Construction (# / mm)	Strand Diameter	Diameter	Wall Thickness		Diameter (mm)	Weight
		Max. (mm)	Max. (mm)	Min. (mm)	Nom. (mm)		Nom. (kg/km)
0.35	7 / .26	0.27	0.90	0.20	0.25	1.30 ± 0.10	4.39
0.50	19 / .18	0.19	1.10	0.22	0.28	1.50 ± 0.10	6.15
0.75	19 / .22	0.24	1.30	0.24	0.30	1.80 ± 0.10	8.82
1.00	19 / .26	0.27	1.50	0.24	0.30	2.00 ± 0.10	11.5
1.50	19 / .31	0.33	1.80	0.24	0.30	2.30 ± 0.10	16.6
2.00	19 / .36	0.38	2.00	0.28	0.35	2.65 ± 0.15	22.4
2.50	19 / .40	0.43	2.20	0.28	0.35	2.85 ± 0.15	26.2
3.00	19 / .45	0.46	2.40	0.32	0.40	3.25 ± 0.15	34.0

Size ISO Conductor Size (mm <sup>2</sup> )	Conductor Resistance @ 20 °C		Abrasion Resistance		
	Max. (mΩ/m)	Min. (mΩ/m)	Sandpaper		Scrape
			Mass (kg)	Min. Length (mm)	Min. Cycles
0.35	54.4	50.0	0.10	250	150
0.50	37.1	34.1	0.20	300	300
0.75	24.7	22.7	0.20	350	350
1.00	18.5	17.0	0.20	400	400
1.50	12.7	11.7	0.20	450	450
2.00	9.42	8.66	0.20	500	500
2.50	7.60	6.99	0.50	250	550
3.00	6.15	5.66	0.50	300	600



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Table 3

ISO Conductor Size	Maximum DCR @ 20 °C	Theoretical Ampacity (Maximum Current, Amps)	(Single Cable Routing in a Non-Enclosed Space)					
			Ambient Temperature					
mm <sup>2</sup>	mΩ/m		22 °C	50 °C	75 °C	100 °C	115 °C	120 °C
0.35	54.4	10	9	7	5	3	2	
0.5	37.1	13	11	9	7	4	3	
0.75	24.7	18	15	12	9	6	4	
1	18.5	22	18	15	11	7	5	
1.5	12.7	28	24	19	14	9	6	
2	9.42	34	29	24	17	11	8	
2.5	7.60	40	34	28	20	12	9	
3	6.15	47	40	33	23	15	10	



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