The Advance Model SI8 Casing Spacers shall be constructed of circular carbon steel bands, which bolt together forming a shell around the carrier pipe. The spacers shall be designed with risers (when engineering deems necessary) and runners to support the carrier within the casing and maintain a minimum clearance of 1.00" between the casing ID and the spacer OD. On carrier pipes with a nominal OD of 36" or less, each spacer shall contain four riser and runner combinations - two on each half. On carrier pipes with a nominal OD above 36", APS' engineering department reserves the right to submit a casing spacer option best suited for the application. Plated steel bolts, nuts and washers shall be supplied with the casing spacers.

The band shall be manufactured of 8" wide, hot rolled, pickled, and oiled 14-gauge carbon steel. The risers (when applicable) shall be constructed of hot rolled, pickled, and oiled 10-gauge carbon steel having a minimum length of 6" and a height to be determined based on the annular space between the carrier OD and the casing ID.

Abrasion resistant runners, having a minimum length of 7" and a minimum width of 2", shall be attached to each band and/or riser (depending on design criteria) to minimize friction between the casing pipe and the carrier pipe as it is installed. Runner material shall be of glass filled polymer with a compression strength of 33,000 psi, flexural strength of 40,000 psi and tensile strength of 27,000 psi. The ends of all runners shall be beveled to facilitate installation over rough weld beads or the welded ends of misaligned or deformed casing pipe.

Interior surfaces of the circular carbon steel band shall be lined with PVC, or EPDM alternate, having a minimum thickness of .090" with a hardness of Durometer “A” 85-90.

Recommended positioning of the spacers is one placed 12 inches minimum, 24 inches maximum on each side of the bell joint and one placed every 10 feet apart thereafter. For special applications or positioning options, please consult factory.

Advance Products & Systems, Inc. certifies that the Model SI8 and SIM steel casing spacers are of the highest quality and meet or exceed industry standards.
Physical Properties

BAND and RISERS
Band – 14-Gauge, hot rolled, pickled & oiled Steel
Riser – 10-Gauge, hot rolled, pickled & oiled Steel

LINER – PVC (Polyvinyl Chloride)
Thickness - .090" (2.29mm) minimum
Hardness - Durometer “A” 85-90
Dielectric Strength - {1/8" (3.18 mm) thick} 60,000 VPM
Water Absorption - 1% maximum
Overlaps edges

LINER - EDPM (Polyvinyl Chloride Alternate)
Thickness - .090" (2.29mm) minimum
Hardness - Durometer “A” 85-90
Dielectric Strength - {1/8" (3.18 mm) thick} 50,000 VPM
Water Absorption - 1% maximum
Overlaps edges

BOLTS, NUTS and WASHERS
Up to nominal OD of 16” - Electro Plated – 1/4” – 20UNC x 2” long bolts
  1/4" hex nuts
  1/4" washers SAE 2330
Above nominal OD of 16” - Electro Plated – 5/16” – 18UNC x 2” long bolts
  5/16" hex nuts
  5/16" washers SAE 2330

RUNNERS
1” wide or 2” wide glass filled polymer

Sizes Available:
Length - 7” (17.8 cm)
Effective heights for pipes with a nominal OD of 24” or less (As applicable) –
  1”, 1 ¼”, 1 ½”, 2”, 2 ½”, 3”, 3 ¼”, 4”, 4 ½”, 5”, 5 ½”, 6”
Effective heights for pipes with a nominal OD of 18” and larger (As applicable) –
  1 ½”

Material Specifications:
Rockwell Hardness (M) – (ASTM D 785) = 100
Tensile Strength – (ASTM D 638) = 27,000 psi
Flexural Strength – (ASTM D 790) = 40,000 psi
Compression Strength – (ASTM D 695) = 33,000 psi
Deflection Temperature @ 264 psi – (ASTM D 648) = 478°F (248°C)
Deformation Under Load @ 122°F (50°C) (4000 lb. Load) – (ASTM D 648) = 1.2%

FINISH
Copolymer-based Thermoplastic Specifications
Adhesion – (ASTM D 4541) = >800 psi
Durometer - Shore D (ASTM D 2240) = 53
Maximum Operating Temperature (Constant) = 150°F (65°C)

**WELDING**
All risers shall be welded to the band by MIG welding.
The Advance Model SIM Casing Spacers shall be constructed of circular carbon steel bands, which bolt together forming a shell around the carrier pipe. The spacers shall be designed with runners to support the carrier within the casing and maintain a minimum clearance of 1.00" between the casing ID and the spacer OD. Designed for carrier pipes up to 24” nominal size, each spacer shall contain four modular runners - two on each half. On carrier pipes with a nominal OD above 24”, APS engineering department reserves the right to submit a casing spacer design best suited for the application. Plated steel bolts, nuts and washers shall be supplied with the casing spacers.

The band shall be manufactured of 8” wide, hot rolled, pickled, and oiled 14-gauge carbon steel.

Abrasion resistant runners, having a minimum length of 7” and a minimum width of 2”, shall be attached to each band and/or riser (depending on design criteria) to minimize friction between the casing pipe and the carrier pipe as it is installed. Runner material shall be of glass filled polymer with a compression strength of 33,000 psi, flexural strength of 40,000 psi and tensile strength of 27,000 psi. The ends of all runners shall be beveled to facilitate installation over rough weld beads or the welded ends of misaligned or deformed casing pipe.

Interior surfaces of the circular carbon steel band shall be lined with PVC, or EPDM alternate, having a minimum thickness of .090” with a hardness of Durometer “A” 85-90.

Recommended positioning of the spacers is one placed 1 – 2 feet on each side of the bell joint and one placed every 7 - 9 feet apart thereafter. For special applications or positioning options, please consult factory.

Advance Products & Systems, Inc. certifies that the Model SIM steel casing spacers are of the highest quality and meet or exceed industry standards.

(Continued)
**Physical Properties**

**BAND**
Band – 14-Gauge, hot rolled, pickled & oiled Steel

**LINER – PVC (Polyvinyl Chloride)**
Thickness - .090” (2.29mm) minimum
Hardness - Durometer “A” 85-90
Dielectric Strength - {1/8” (3.18 mm) thick} 60,000 VPM
Water Absorption - 1% maximum
Overlaps edges

**LINER - EDPM (Polyvinyl Chloride Alternate)**
Thickness - .090” (2.29mm) minimum
Hardness - Durometer “A” 85-90
Dielectric Strength - {1/8” (3.18 mm) thick} 50,000 VPM
Water Absorption - 1% maximum
Overlaps edges

**BOLTS, NUTS and WASHERS**
Up to nominal OD of 16” - Electro Plated – 1/4” – 20UNC x 2” long bolts
   1/4” hex nuts
   1/4” washers SAE 2330
Above nominal OD of 16” - Electro Plated – 5/16” – 18UNC x 2” long bolts
   5/16” hex nuts
   5/16” washers SAE 2330

**RUNNERS**
2” wide glass filled polymer

**Sizes Available:**
Length - 7” (17.8 cm)
Effective heights - 2”, 2 ½”, 3”, 3 ½”, 4”, 4 ½”, 5”, 5 ½”, 6”

**Material Specifications:**
Rockwell Hardness (M) – (ASTM D 785) = 100
Tensile Strength – (ASTM D 638) = 27,000 psi
Flexural Strength – (ASTM D 790) = 40,000 psi
Compression Strength – (ASTM D 695) = 33,000 psi
Deflection Temperature @ 264 psi – (ASTM D 648) = 478°F (248°C)
Deformation Under Load @ 122°F (50°C) (4000 lb. Load) – (ASTM D 648) = 1.2%
Coefficient of friction – 0.1

**FINISH**
Copolymer-based Thermoplastic Specifications
Adhesion – (ASTM D 4541) = >800 psi
Durometer - Shore D (ASTM D 2240) = 53
Maximum Operating Temperature (Constant) = 150°F (65°C)
The Advance Model SI12 Casing Spacers shall be constructed of circular carbon steel bands, which bolt together forming a shell around the carrier pipe. The spacers shall be designed with risers (when engineering deems necessary) and runners to support the carrier within the casing and maintain a minimum clearance of 1.00" between the casing ID and the spacer OD. On carrier pipes with a nominal OD of 36" or less, each spacer shall contain four riser and runner combinations - two on each half. On carrier pipes with a nominal OD above 36", APS’ engineering department reserves the right to submit a casing spacer option best suited for the application. Plated steel bolts, nuts and washers shall be supplied with the casing spacers.

The band shall be manufactured of 12" wide, hot rolled, pickled, and oiled 14-gauge carbon steel. The risers (when applicable) shall be constructed of hot rolled, pickled, and oiled 10-gauge carbon steel having a minimum length of 10" and a height to be determined based on the annular space between the carrier OD and the casing ID.

Abrasion resistant runners, having a minimum length of 11" and a minimum width of 2", shall be attached to each band and/or riser (depending on design criteria) to minimize friction between the casing pipe and the carrier pipe as it is installed. Runner material shall be of glass filled polymer with a compression strength of 33,000 psi, flexural strength of 40,000 psi and tensile strength of 27,000 psi. The ends of all runners shall be beveled to facilitate installation over rough weld beads or the welded ends of misaligned or deformed casing pipe.

Interior surfaces of the circular carbon steel band shall be lined with PVC, or EPDM alternate, having a minimum thickness of .090" with a hardness of Durometer “A” 85-90.

Recommended positioning of the spacers is one placed 1 – 2 feet on each side of the bell joint and one placed every 6 - 8 feet apart thereafter. For special applications or positioning options, please consult factory.

Advance Products & Systems, Inc. certifies that the Model SI12 steel casing spacers are of the highest quality and meet or exceed industry standards.

(continued)
SPECIFICATIONS AND CERTIFICATE OF COMPLIANCE FOR THE:

APS FUSION COATED STEEL BAND CASING SPACER

MODEL SI12

Page 2

Physical Properties

BAND and RISERS
Band – 14-Gauge, hot rolled, pickled & oiled Steel
Riser – 10-Gauge, hot rolled, pickled & oiled Steel

LINER – PVC (Polyvinyl Chloride)
Thickness - .090” (2.29mm) minimum
Hardness - Durometer “A” 85-90
Dielectric Strength - {1/8” (3.18 mm) thick} 60,000 VPM
Water Absorption - 1% maximum
Overlaps edges

LINER – EPDM (Polyvinyl Chloride Alternate)
Thickness - .090” (2.29mm) minimum
Hardness - Durometer “A” 85-90
Dielectric Strength - {1/8” (3.18 mm) thick} 50,000 VPM
Water Absorption - 1% maximum
Overlaps edges

BOLTS, NUTS and WASHERS
Up to nominal OD of 16” - Electro Plated – 1/4” – 20UNC x 2” long bolts
1/4” hex nuts
1/4” washers SAE 2330
Above nominal OD of 16” - Electro Plated – 5/16” – 18UNC x 2” long bolts
5/16” hex nuts
5/16” washers SAE 2330

RUNNERS
2” wide glass filled polymer

Sizes Available:
Length - 11” (27.94 cm)
Effective heights for all nominal OD pipes – 1” and 1 ½”

Material Specifications:
Rockwell Hardness (M) – (ASTM D 785) = 100
Tensile Strength – (ASTM D 638) = 27,000 psi
Flexural Strength – (ASTM D 790) = 40,000 psi
Compression Strength – (ASTM D 695) = 33,000 psi
Impact Strength – (ASTM D 3029) = 24 lbs.
Deflection Temperature @ 264 psi – (ASTM D 648) = 478°F (248°C)
Deformation Under Load @ 122°F (50°C) (4000 lb. Load) – (ASTM D 648) = 1.2%
Water Absorption – (ASTM D 570) = <0.01%

FINISH
Copolymer-based Thermoplastic Specifications
Adhesion – (ASTM D 4541) = >800 psi
Durometer - Shore D (ASTM D 2240) = 53
Maximum Operating Temperature (Constant) = 150°F (65°C)
Electric Strength – (ASTM D 119) – 950 v/mil (37.4 kv/mm)
Salt Fog – (ASTM B117, 96 hours) = No effect.

WELDING
All risers shall be welded to the band by MIG welding.