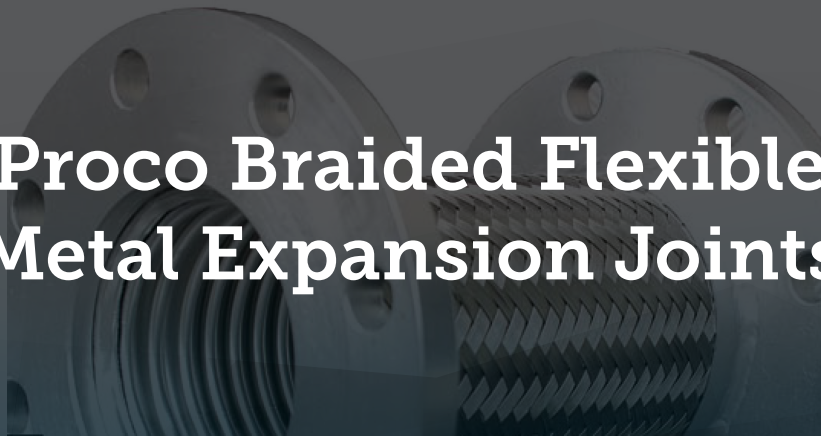




Proco Braided Flexible Metal Expansion Joints



Proco Braided Flexible Metal Expansion Joints



Proco Products braided flexible metal pump connectors have been designed to control vibration, reduce noise, relieve stress, prevent system shock and compensate for misalignment and movement. Use of braided metal connectors for applications such as pumps, compressors, and other mechanical equipment will enhance the overall operation of the system. Flexible metal hose by itself, when subjected to high pressure can over-extend past the ability to operate properly. It is necessary, therefore, to include an external flexible restraint (i.e., braid) to withstand the specified internal pressure and prevent excessive elongation. Braid, (woven metal) is designed to fit snugly over metal hose and is fastened to the ends of both hose and fittings. This braid is designed to be strong enough to withstand elongation for the full pressure rating of the hose. Flexible metal hose and braid can be made from a variety of different metals to meet industry needs. Specification of the hose and braid is determined by temperature, pressure, flow media, application and external environment. Common materials used for braided flexible metal connectors are 321 stainless steel hose and a 304 stainless steel braid and are carried in stock by Proco products. The products contained in this catalog are representative of the typical sizes, lengths and materials found for pump connectors; however, other materials and lengths are available and can be ordered per customer specification.

PROCO "THE EXPANSION JOINT PEOPLE"

PROCO PRODUCTS, INC. IS HEADQUARTERED IN STOCKTON, CALIFORNIA

Our 17,144 square foot warehouse houses one of the largest inventories of expansion joint products in North America. Proco is a major supplier of rubber expansion joints, PTFE expansion joints, rubber pipe vibration dampeners, low torque gaskets, threaded union rubber connectors, flexible metal pump connectors, and duck billed rubber check valves. Proco markets products to the power generation industry, refinery & chemical process industry, HVAC industry, pulp & paper industry, water & waste-water treatment industry and general industrial institutions through a distribution network.

For a complete catalog set of important on products offered by Proco, please contact the customer Service Department at 800-344-3246 (USA/Canada), 209-943-6088 (International) or use the attached specification sheet found on the back page of this catalog and fax your request to 209-943-0242.

LARGEST INVENTORY

Proco has one of the largest inventories in North America. Our customer service staff is ready to field your request.

EMERGENCIES HAPPEN

When they do and you need one of Proco's various standard products, it is relieving to know we can respond with same day shipment from order placement.

So when you or your customer have an emergency request. . . CALL Proco! Day or night, Proco will respond to your request and meet your urgent need.

AFTER HOURS SERVICE

call our 800 Number with your Urgent request! We will respond to meet your urgent need. There is no other phone number to remember.

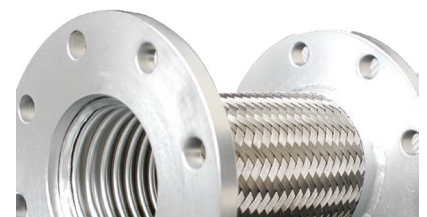
EXPEDITE SHIPPING

PROCO'S Stocked Inventory can ship same day as order placement. . . .

Customer's can also count on consistent shipping costs due to our contracts with various well known carriers.

Our shipment tracking system also gives customers assurance that their package is always accounted for.

We can ship Standard Surface, 2nd or Next Day Air. In addition, our experience in export shipments is second to none.



Proco Braided Flexible Metal Expansion Joints

SERIES FF - 6201

Braided Flexible Metal Flanged Connectors (321 Stainless Steel Hose with 304 Stainless Steel Braid and Carbon Steel Plate Flanges).

Table 1: Sizes • Offset • Working Pressures • Weights

Expansion Joint Size: ID X Length	Stock	Lateral Offset		Working Press (PSI)		Approx. Unit Ship Weight
		Inter-mittent	Perma-nent	@70 °F	@300 °F	
2 x 9	S	1/8"	3/8"	455	400	9
2 x 12	S	3/4"	1"	455	400	12
2 1/2 x 9	S	1/8"	3/8"	345	303	13
2 1/2 x 10	S	1/8"	3/8"	345	303	13
2 1/2 x 10 1/4	S	3/8"	3/4"	345	303	13
2 1/2 x 12	S	3/4"	1"	345	303	13
3 x 9	S	1/8"	3/8"	289	254	14
3 x 10	S	1/8"	3/8"	289	254	14
3 x 10 5/8	S	3/8"	3/4"	289	254	14
3 x 14	S	3/4"	1"	289	254	15
4 x 9	S	1/8"	3/8"	300	264	18
4 x 10	S	1/8"	3/8"	300	264	18
4 x 11 3/4	S	3/8"	3/4"	300	264	19
4 x 16	S	3/4"	1"	300	264	20
5 x 11	S	1/8"	3/8"	220	193	25
5 x 12	S	1/8"	3/8"	220	193	25
5 x 13 5/8	S	3/8"	3/4"	220	193	27
5 x 18	S	3/4"	1"	220	193	30
6 x 11	S	1/8"	3/8"	200	176	28
6 x 12	S	1/8"	3/8"	200	176	28
6 x 14 1/8	S	3/8"	3/4"	200	176	30
6 x 20	S	3/4"	1"	200	176	34
8 x 12	S	1/8"	3/8"	190	167	52
8 x 13	S	1/8"	3/8"	190	167	52
8 x 15 3/8	S	3/8"	3/4"	190	167	64
8 x 22	S	3/4"	1"	190	167	65
10 x 13	S	1/8"	3/8"	165	145	65
10 x 14	S	1/8"	3/8"	165	145	65
10 x 17 3/4	S	3/8"	3/4"	165	145	68
10 x 24	S	3/4"	1"	165	145	75
12 x 14	S	1/8"	3/8"	125	110	105
12 x 15	S	1/8"	3/8"	125	110	105
12 x 18 3/8	S	3/8"	3/4"	125	110	110
12 x 26	S	3/4"	1"	125	110	113
14 x 14	S	1/8"	3/8"	105	92	115
14 x 15	S	1/8"	3/8"	105	92	115
14 x 20	X	3/8"	3/4"	105	92	119
14 x 28	X	3/4"	1"	105	92	126

NOTES: 1. "S" Indicates stocked item.

2. "X" Denotes 1-2 week shipment time.



Proco Braided Flexible Metal Expansion Joints

SERIES GG - 6201 OR SERIES GF - 6201

Braided Flexible Metal Grooved Connectors (321 Stainless Steel Hose with 304 Stainless Braid and Grooved Ends or Grooved by Flange Ends).

Table 2: Sizes • Offset • Working Pressures • Weights

Expansion Joint Size: ID X Length	Stock	Lateral Offset		Working Press (PSI)		Approx. Unit Ship Weight
		Inter-mittent	Perma-nent	@70 °F	@300 °F	
2 x 12	S	1/8"	3/8"	450	396	10
2 1/2 x 14	S	1/8"	3/8"	345	303	12
3 x 14	S	1/8"	3/8"	289	254	13
4 x 16	S	1/8"	3/8"	300	264	18
5 x 17	S	1/8"	3/8"	220	193	25
6 x 18	S	1/8"	3/8"	200	176	28
8 x 20	S	1/8"	3/8"	190	167	50
10 x 24	S	1/8"	3/8"	150	132	70
12 x 25	S	1/8"	3/8"	125	110	90

NOTES: 1. Also comes in Grooved by Flange Design.

Please specify series GF-6201

2. Weight based on Series GF-6201

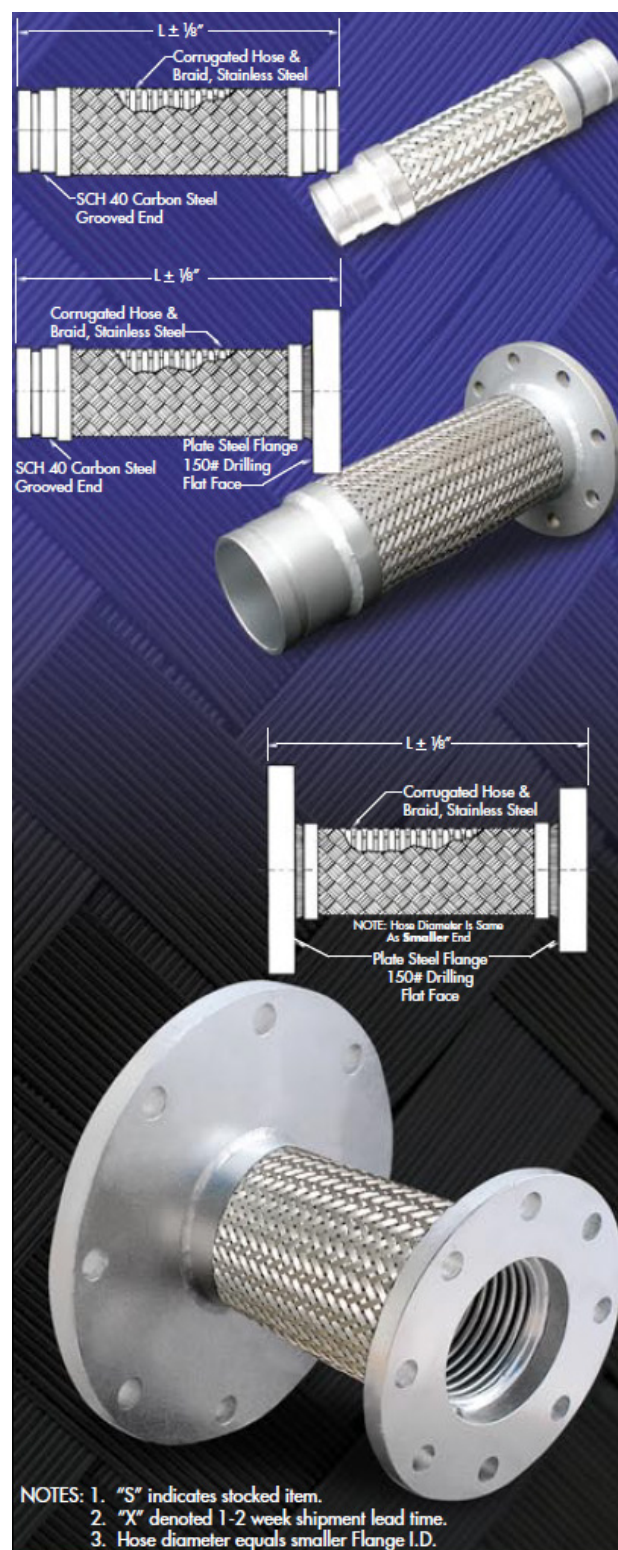
3. "S" indicates stocked item.

SERIES R - 6201

Braided Flexible Metal Reducing Connectors (321 Stainless Hose with 304 Stainless Steel Braid and Carbon Steel Plate Flanges).

Table 3: Sizes • Offset • Working Pressures • Weights

Expansion Joint Size: ID X ID X Length	Stock	Lateral Offset		Working Press (PSI)		Approx. Unit Ship Weight
		Inter-mittent	Perma-nent	@70 °F	@300 °F	
3 x 2 1/2 x 9	S	1/8"	3/8"	345	303	14
4 x 2 x 9	S	1/8"	3/8"	455	400	14
4 x 2 1/2 x 9	S	1/8"	3/8"	345	303	14
4 x 3 x 9	S	1/8"	3/8"	289	254	16
5 x 3 x 9	S	1/8"	3/8"	289	254	22
5 x 4 x 9	S	1/8"	3/8"	300	264	25
6 x 3 x 9	S	1/8"	3/8"	289	254	23
6 x 4 x 9	S	1/8"	3/8"	300	264	30
6 x 5 x 11	S	1/8"	3/8"	220	193	35
8 x 4 x 11	S	1/8"	3/8"	300	264	58
8 x 5 x 11	S	1/8"	3/8"	220	193	58
8 x 6 x 11	S	1/8"	3/8"	200	176	61
10 x 6 x 11	S	1/8"	3/8"	200	176	80
10 x 8 x 11	S	1/8"	3/8"	190	167	85
12 x 8 x 12	S	1/8"	3/8"	190	167	105
12 x 8 x 14	S	1/8"	3/8"	190	167	135
12 x 10 x 13	S	1/8"	3/8"	150	132	135
14 x 10 x 13	X	1/8"	3/8"	120	105	140
14 x 12 x 14	X	1/8"	3/8"	100	88	145



Proco Braided Flexible Metal Expansion Joints

SERIES TTS - 6201

Braided Flexible Metal Threaded Connectors (321 Stainless Steel Hose with 304 Stainless Steel Braid and Male Carbon Steel Ends (NPT).

Table 4: Sizes • Offset • Working Pressures • Weights

Expansion Joint Size: ID X Length	Stock	Lateral Offset		Working Press (PSI)		Approx. Unit Ship Weight
		Inter-mittent	Perma-net	@ 70 °F	@ 300 °F	
1/2 x 6 1/2	S	1/4"	1/2"	1300	1144	1
1/2 x 9	S	1/4"	1/2"	1300	1144	1
1/2 x 10	S	1/4"	1/2"	1300	1144	1
3/4 x 7	S	1/4"	1/2"	880	774	1
3/4 x 10	S	1/4"	1/2"	880	774	1
3/4 x 11	S	1/4"	1/2"	880	774	1
1 x 8	S	1/4"	1/2"	605	532	1
1 x 10	S	1/4"	1/2"	605	532	1
1 1/4 x 8 1/2	S	1/4"	1/2"	605	532	1
1 1/4 x 10	S	1/4"	1/2"	570	501	1 1/2
1 1/4 x 11	S	1/4"	1/2"	570	501	1 1/2
1 1/4 x 12	S	1/4"	1/2"	570	501	2
1 1/4 x 13	S	1/4"	1/2"	570	501	2
1 1/2 x 9	S	1/4"	1/2"	570	501	1 1/2
1 1/2 x 12	S	1/4"	1/2"	525	462	1 1/2
1 1/2 x 14	S	1/4"	1/2"	525	462	2
2 x 10 1/2	S	1/4"	1/2"	455	400	2
2 x 12	S	1/4"	1/2"	455	400	2 1/2
2 x 14	S	1/4"	1/2"	455	400	3
2 x 15	S	1/4"	1/2"	455	400	3
2 1/2 x 12	S	1/4"	1/2"	345	303	5
2 1/2 x 14	S	1/4"	1/2"	345	303	5 1/2
2 1/2 x 16	S	1/4"	1/2"	345	303	6
3 x 14	S	1/4"	1/2"	290	255	8
3 x 16	S	1/4"	1/2"	290	255	9
3 x 17	S	1/4"	1/2"	290	255	10

NOTES: 1. "S" indicates stocked item.
2. "X" denotes 1-2 week shipment lead time.



Proco Braided Flexible Metal Expansion Joints

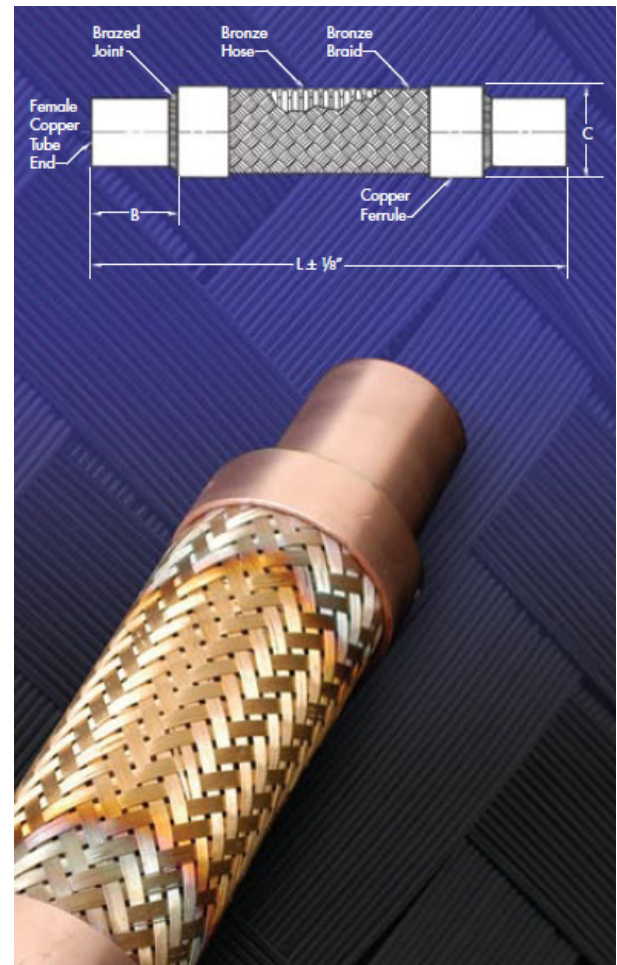
SERIES SEB - 6201

Braided Flexible Metal Sweat Connectors (Bronze Hose with Bronze Braid and Copper Female Ends).

Table 6: Sizes • Offset • Working Pressures • Weights

Expansion Joint Size: ID X Length	Stock	Lateral	Working Press (PSI)		Approx. Unit Ship Weight
		Offset Permanet	@ 70 °F	@ 300 °F	
1/2 x 10	S	1"	450	374	1
1/2 x 11	S	1"	450	374	1
3/4 x 10	S	3/4"	340	282	1
3/4 x 11	S	3/4"	340	282	1
1 x 10	S	1/2"	302	250	1
1 x 12	S	1/2"	302	250	1 1/2
1 1/4 x 10	S	3/8"	280	232	2
1 1/4 x 11	S	3/8"	280	232	2
1 1/4 x 13	S	3/8"	245	203	2
1 1/2 x 12	S	3/8"	245	203	3
1 1/2 x 14	S	3/8"	245	203	3
2 x 14	S	3/8"	190	157	5
2 x 15	X	3/8"	190	157	5

NOTES: 1. "S" indicates stocked item.
2. "X" denotes 1-2 week shipment lead time.



Proco Braided Flexible Metal Expansion Joints



TEMPERATURE

Temperature correction factors and maximum material temperature ranges for braided flexible metal pipe connectors.

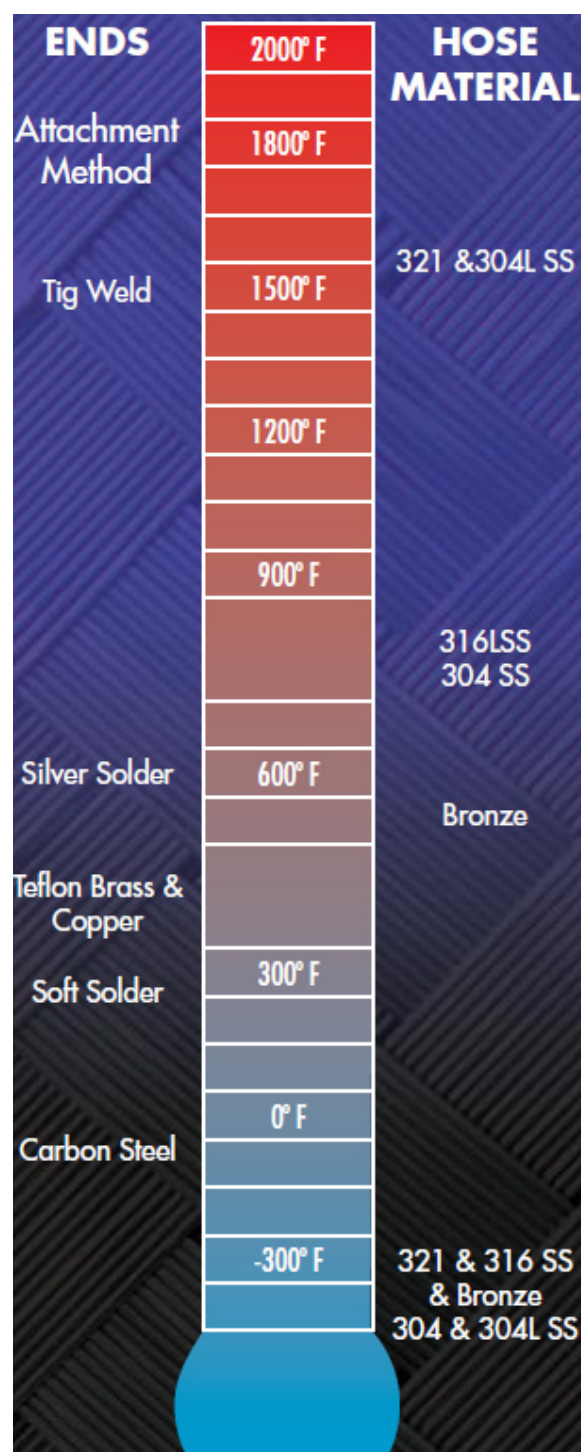
Temp °F	Material		
	Bronze	304 SS	321 SS
Ambient	1.00	1.00	1.00
150	.92	.96	.97
200	.89	.92	.94
250	.85	.91	.92
300	.83	.86	.88
350	.81	.85	.86
400	.78	.82	.83
450	.75	.80	.81
500		.77	.78
600		.73	.74
700		.69	.70
800		.64	.66
900		.58	.62
1000			.60
1100			.58
1200			.55
1300			.50
1400			.44
1500			.40

TEMPERATURE CORRECTION FACTORS

1. Determine maximum operating temperature.
2. Locate appropriate correction factor above.
3. Multiply maximum working pressure by correction factor at temperature for acceptable rating.

Service temperature for a braided flexible metal pump connector has a negative affect on the amount of maximum pressure to which it can be subjected. The table above should be used to calculate the safe working pressure based on the elevated temperature the braided metal pump connector is operating under. (Working Pressure X Elevated Temperature Conversion Figure = Safe Working Pressure.)

Contact Proco'S sales office at 1-800-344-3246 (209 943-6088 outside USA/canada) if help is needed with using the temperature correction chart.



Proco Braided Flexible Metal Expansion Joints



INSTALLATION INSTRUCTIONS

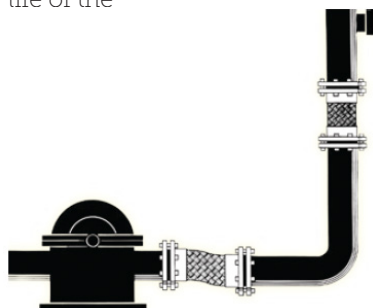
To obtain maximum service life from a Proco Braided Flexible Metal Connector, please consider the following:

Proper placement is essential to the operating life of a flexible connector. For best results place flexible connectors adjacent to rotating equipment, in a straight line without offset. Flexible connectors installed before and after rotating equipment will help isolate the piping system from excessive vibration and noise. Anchors should be installed immediately beyond the connector.

Braided flexible metal connectors must be installed at or below the listed permanent lateral offset values listed on pages 3-6 of this manual.

Failure to stay within these parameters can reduce the operating life of the flexible connector.

For lateral movements greater than those listed in tables on pages 3-6, it is possible to install two flexible connectors in a pipe system to achieve greater flexibility. Install two connectors at right angles to one another and between two anchor points. This scheme will allow for increased lateral offset capabilities. (See Figure 1.)



Flanged Flexible Connectors Flange alignment should be in accordance with industry standards. Bolt holes should be aligned so that braided flexible metal connectors are free of torsional movements, reduced operating life or failure will occur.

Threaded Flexible Connector Install one end of threaded connector to loose union and tighten. Install opposite threaded end of flexible connector to threaded pipe fitting and tighten. When installing union end to adjacent pipe fitting, it is important not to introduce torque to the braided flexible metal connector. If the flexible connector is subjected to torsional movements, reduced operating life or failure will occur.

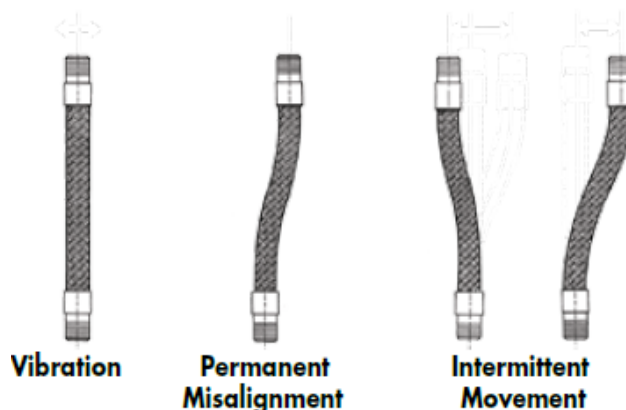
Sweat End Flexible Connector Install female ends of the flexible connector to adjacent male ends of pipe in such a manner to eliminate any torque that may be imposed during fit-up.

TYPES OF OFFSET MOTION

VIBRATION Install in a straight line with a rigid support on the fixed end.

MISALIGNMENT - (PERMANENT MISALIGNMENT) Allow sufficient length to make a gradual bend.

INTERMITTENT MOVEMENT Refer to charts on pages 3-6 for maximum movement capabilities. Where offset movement occurs on both sides of the pipe centerline, the braided flexible hose live length should be based on the total stroke. For movement greater than those stated in this manual, it is suggested that a traveling loop system be used.



Proco Braided Flexible Metal Expansion Joints



REFERENCE TABLE

The information contained herein this table is to be used as a guide for the selection of braided metal pump connector materials (i.e. hose and braid) suitable for chemicals listed below. This data should not be construed as advice to use or not use.

Ultimate responsibility lies with the system designer or operator for correct material selection based on flow media. It is suggested that flow media be listed on the "Connector Specification Data Sheet", found on the back of this manual when requesting a quotation.

Corrosion Rate:



A - RESISTANT
B - PARTIALLY
RESISTANT C - NON
RESISTANT



less than .00035 inch penetration per month.
.0035 inch penetration per month.
greater than .0035 inch penetration per month.

Chemical	Temp. °F.	304, 321 S.S.	Carbon Steel	Bronze	Chemical	Temp. °F.	304, 321 S.S.	Carbon Steel	Bronze	Chemical	Temp. °F.	304, 321 S.S.	Carbon Steel	Bronze
Acetic Acid 5%, 20% Agitated or Aerated	70°	A	C	C	Ammonium Sulphate					Citric Acid, 5% Still	70° - 150°	A	C	A
50%	70°	A	C	C	1% Aerated or Agitated	70°	A	C	C	15% Still	70°	A	C	B
50% - 80%	Boiling	C	C	C	5% Aerated or Agitated	70°	A	C	C	15% or Concentrated	Boiling	B	C	B
80%	70°	A	C	C	10% & Saturated	Boiling	B ⁴	C	C	Coffee RSC	Boiling	A	C	A
100%	70°	A	C	C	Ammonium Sulphate, 70% Boiling	70°	A	C	C	Copper Acetate (Saturated Solution)	70°	A	C	C
100%	Boiling	C	C	C	Barium Carbonate	70°	A	B	A	Copper Carbonate (Sat. Sol.) in 50% NH ₄ OH		A		C
100% - 150 lbs. Pressure	400°	C	C	C	Barium Chloride 5% & Saturated	70°	A ^{3,4}	C	B	Copper Chloride,				
Acetic Acid Vapors, 30%	Hot	C	C	C	Barium Hydroxide Aqueous Solution	Hot	A	B	A	1% Agitated	70°	B ^{3,4}	C	C
100%	Hot	C	C	C	Barium Nitrate Aqueous Solution	Hot	A	B		1% Aerated	70°	B ^{3,4}	C	C
Acetyl Chloride	Cold	B ³	C	B	Barium Sulphate	70°	A		A	5% Agitated	70°	C	C	C
	Boiling	B ³	C	B	Barium Sulphide Saturated Solution	70°	A	C	C	5% Aerated	70°	C	C	C
Acetylene Concentrated	70°	A	A	C ²	Beer (Barley, Malt & Hops)	70°	A	C	A	Copper Cyanide (Saturated Solution)	Boiling	A	C	C
Commercially Pure	70°	A	A	C ²	3.5% - 4.5% Alcohol	160°	A	C	A	Copper Nitrate				
Acid Salt Mixture					Benzene (Benzol) 70° or Hot	70°	A	B	A	1% Still, Agitated & Aerated	70°	A	C	C
10% H ₂ SO ₄ Sp. G. 1.07 + 10% CuSO ₄ + 5 H ₂ O	Boiling	A ^{3,4}	C	C	Benzoic Acid	70°	A	A	A	5% Still, Agitated & Aerated	70°	A	C	C
Acid Salt Mixture					Borax 5%	Hot	A	B	A	50% Aqueous Solution	Hot	A	C	C
10% H ₂ SO ₄ Sp. G. 1.07 + 2% FeSO ₄ + 7 H ₂ O	Boiling	A ^{3,4}	C	C	Boric Acid					Copper Sulphate				
Alcohol, Ethyl, 70° & Boiling	70°	A	A	A	5% Solution, 70° or Hot	70°	A	C	A	5% Agitated Still or Aerated	70°	A	C	B
Alcohol, Methyl	70°	A	A	A	5% Solution	Boiling	A	C	A	Saturated Solution	Boiling	A	C	B
	Boiling	C	C	A	Saturated Solution	70°	A ^{3,4}	C	B	Creosote (Coal Tar)	Hot	A	B	A
Aluminum Acetate, Saturated	70°	A	C	C	Saturated Solution	Boiling	A ^{3,4}	C	C	Creosote Oil	Hot	A	B	B
	Boiling	A	C	C	Bromine Water	70°	C	C	C	Dichloroethane (Dry)	Boiling	A	C	C
Aluminum Chloride					Butyl Acetate		A	B		Dyewood Liquor	70°	A ³	C	
10% Quiescent	70°	C	C	C	Calcium Chloride Dilute or Concen. Solution	70°	B ^{3,4}	C	B	Epsom Salt (Magnesium Sulphate)	Hot & Cold	A ^{3,4}	C	A
25% Quiescent	70°	A ^{3,4}	C	C	Calcium Chlorohypochlorite					Ethyl Acetate (Concentrated Solution)	70°	A	B	A
Aluminum Fluoride	70°	C	C	C	(Bleaching Powder) 1%	70°	C	C	B	Ethyl Chloride	70°	A ^{3,4}	B	B
Aluminum Hydroxide, Saturated	70°	A	A ⁴	A	(Bleaching Powder) 5%	70°	C	C	B	Ethylene Chloride	70°	A ^{3,4}	B	B
Aluminum Sulphate, 5%	150°	A	C	C	Calcium Hypochlorite, 2%	70°	B ⁴	C	B	Ethylene Glycol	70°	A	B	A
10%	70°	A	C	C	Calcium Hydroxide, 10-20%	Boiling	A	C	A	Ferric Chloride				
10%	Boiling	B	C	C	Calcium Sulphate, Saturated	70°	A	C	A	1% Solution Still	70°	B ^{3,4}	C	C
Saturated	70°	A	C	C	Carbonic Acid Saturated Solution	70°	A	C	A	1% Solution	Boiling	C	C	C
Saturated	Boiling	B	C	C	Carbolic Acid	70°	A	C	B	5% Solution, Agitated, Aerated	70°	C	C	C
Aluminum Potassium Sulphate:					Carbolic Acid	Boiling	A	C	B	Ferric Hydroxide		A	C	
(Alum) 2% - 10%	70°	A	C	B	Carbon Bisulfide	70°	A	B	B	Ferric Nitrate				
10%	Boiling	B	C	C	Carbon Monoxide Gas	1400°	A	A	C	1-5% Quiescent or Agitated	70°	A	C	C
Saturated	Boiling	C	C	C	Carbon Monoxide Gas	1600°	A	A	C	1-5% Aerated	70°	A	C	C
Ammonia (Anhydrous):					Carbon Tetrachloride					Ferric Sulphate				
All Concentrations	70°	A	A	A	Commercially Pure	70°	A ^{3,4}	B	A	1-5% Quiescent or Agitated	70°	A ⁴	C	C
Gas	Hot	C	C	C	Dry Commercially Pure	Boiling	A ^{3,4}	B	A	1-5% Aerated	70°	A ⁴	C	C
Ammonia Liquor	70°	A	C	C	Commercial + 1% Water		C	C	B	10%	Boiling	A ⁴	C	C
	Boiling	A	C	C	Chloracetic Acid	70°	C	C	B	Ferrous Chloride: Saturated Solution	70°	C	C	B
Ammonium Bicarbonate	70°	A	C	C	Chlorobenzol Concentrate Pure Dry	70°	A	B	B	Ferrous Sulphate: Dilute Solution	70°	A	C	B
	Hot	A	C	C	Chloric Acid	70°	C	C	C	Fluorine (Gas) Moist	70°	C	C	C
Ammonium Bromide	70°	B	C	C	Chlorine Gas (Dry)	70°	C	B	A	Formaldehyde 40% Solution		A ⁴	B	A
Ammonium Carbonate 1% & 5%	70°	A	A	C	(Moist)	70°	C	C	C	Formic Acid, 5% Still	70°	B	C	B
Ammonium Chloride 1%	70°	A ^{3,4}	B	C	Chlorinated Water, Saturated		C	C		5% Still	150°	B	C	B
10%	Boiling	A ^{3,4}	C	C	Chloroform	70°	A	A	A	Fuel Oil	Hot	A	B	A
28%	Boiling	B ^{3,4}	C	C	Chromic Acid					Containing Sulphuric Acid		C	C	C
50%	Boiling	B ^{3,4}	C	C	5% Commercially Pure	70°	A	C	C	Gallie Acid, 5%	70° - 150°	A	C	
Ammonium Hydroxide: All Concentrations	70°	A	B	C	10%	70°	C	C	C	Saturated	212°	A	C	
Ammonium Monophosphate	70°	A	B	C	Chromic Acid					Gasoline	70°	A	B	A
Ammonium Nitrate:					10% Commercially Pure	Boiling	C	C	C	Hydrochloric Acid: All Concentrations	70°	C	C	C
All Concentrate Agitated	70°	A	C	C ²	50% Commercially Pure	70°	C	C	C	Hydrocyanic Acid	70°	A	C	C
All Concentrate Aerated	70°	A	C	C ²	50% Commercially Pure	Boiling	C	C	C	Hydrofluoric Acid	70°	C	C	C
All Concentrate Saturated	Boiling	A	C	C ²	Commercial 50% (Cont. SO ₂)	70°	C	C	C	Hydrofluosulfic Acid	70°	C	C	B
Ammonium Perchlorate 10%	Boiling	A ^{3,4}	B	C	Commercial 50% (Cont. SO ₂)	Boiling	C	C	C	Hydrogen Sulphide (Dry)	70°	A	B	A
Ammonium Persulphate 5%	70°	A	C	C	Chromium Plating Bath	70°	A	B	C	(Wet)	70°	B ³	C	C
Ammonium Phosphate 5%	70°	A	B	C						Hyposulphite Soda		A	C	

Proco Braided Flexible Metal Expansion Joints



Corrosion Rate:



A - RESISTANT
B - PARTIALLY
RESISTANT C - NON
RESISTANT



less than .00035 inch penetration per month.
0.0035 inch penetration per month.
greater than .0035 inch penetration per month.

Chemical	Temp. °F.	304, 321 S.S.	Carbon Steel	Bronze	Chemical	Temp. °F.	304, 321 S.S.	Carbon Steel	Bronze	Chemical	Temp. °F.	304, 321 S.S.	Carbon Steel	Bronze
Iodine	70°	C	C	C	Phosphoric Acid					Sodium Carbonate, 5%	70°-150°	A ^{1A}	B	B
Kerosene	70°	A	B	A	1%	70°	A	C	C	5%-50%	Boiling	A ^{1A}	B	B
Ketchup, Quiescent	70°-150°	A ⁴	C		1%	Boiling	A	C	C	Sodium Chloride, 5% Still	70°-150°	A ^{1A}	C	B
Lactic Acid 1%	70°	A	C	B	1%-45 lbs. Pressure	200°	A	C	C	20% Aerated	70°	A ^{1A}	C	B
1%	Boiling	A	C	C	5% Quiescent or Agitated	70°	A	C	C	Saturated	70°	A ^{1A}	C	B
5%	70°	A	C	B	5% Aerated	70°	A	C	C	Saturated	Boiling	B ^{1A}	C	B
5%	Boiling	B	C	C	10% Quiescent	70°	C	C	C	Sodium Cyanide	70°	A ^{1A}	B	C
10%	70°	B	C	B	10% Agitated or Aerated	70°	C	C	C	Sodium Fluoride, 5% Solution	70°	B ^{1A}	C	A
10%	Boiling	C	C	C	10%-50%	Boiling	A	C	C	Sodium Hydroxide	70°	A ^{1A}	B	B
Concentrated	70°	B	C	B	80%	70°	C	C	C	Sodium Hypochlorite, 5% Still		B ^{1A}	B	B
Concentrated	Boiling	C	C	C	80%	220°	C	C	C	Sodium Nitrate	Fixed	A ^{1A}	B	A
Lead Acetate 5%	Boiling	A	C		85%	Boiling	C	C	C	Sodium Phosphate	70°	A ^{1A}	B	A
Linseed Oil	70°	A	B	B	Picric Acid	70°	A	C	C	Sodium Sulphate, 5% Still	70°	A ^{1A}	C	A
Plus 3% H ₂ SO ₄	200°	B	C	C	Potassium Bichromate, 25%	70°	A	C	C	All Concentrations	70°	C	C	A
Magnesium Chloride					25%	Boiling	A	C	C	Sodium Sulphide, Saturated		B ^{1A}	C	
1% Quiescent	70°	A ^{1A}	C	B	Potassium Bromide	70°	B ⁴	C	B	Sodium Sulphite, 5%	70°	A ^{1A}	C	B
1% Quiescent	Hot	C	C	B	Potassium Carbonate 1%	70°	A	B	B	10%	150°	A ^{1A}	C	B
5% Quiescent	70°	A ^{1A}	C	B	Potassium Carbonate	Hot	A	B	C	Sodium Thiosulphate				
5% Quiescent	Hot	C	C	B	Potassium Chlorate: Saturated at 212°	Boiling	A ³	B	C	Saturated Solution	70°	A ^{1A}	C	C
Magnesium Oxidechloride	70°	C	C		Potassium Chloride					Acid Fixing Bath (Hypo)	70°	A ^{1A}	C	C
Magnesium Sulphate	Hot & Cold	A	C	A	1% Quiescent	70°	A ^{1A}	C	B	25% Solution	70° & Boiling	A ^{1A}	C	C
Malic Acid	Hot & Cold	B	C		1% Agitated or Aerated	70°	A ¹	C	B	Sulphur, Moist	70°	B ^{1A}	C	C
Mercuric Chloride Dilute Solution	70°	C	C	C	5% Quiescent	70°	A ^{1A}	C	B	Sulphur Chloride (Dry)		C ^{1A}	C	A
Methanol (Methyl Alcohol)	70°	A	B	A	5% Agitated or Aerated	70°	A ³	C	B	Sulphur Dioxide Gas (Moist)	70°	B ^{1A}	C	B
Mixed Acids 53% H ₂ SO ₄ + 45% HNO ₃	Cold	A	C	C	5%	Boiling	A ³	C	B	Gas (Dry)	575°	A ^{1A}	C	A
Muriatic Acid	70°	C	C	C	Potassium Chromium Sulphate, 5%	70°	A ⁴	C	B	Sulphuric Acid				
Naphtha, Crude	70°	A	B	B	Sp. G. 1.6	Boiling	C	C	C	5%-10%	70°	C	C	B
Naphtha, Pure	70°	A	B	B	Potassium Cyanide	70°	A	B	C	5%-10%	Boiling	C	C	C
Naphthalene Sulfonic Acid	70°	A	C		Potassium Ferricyanide, 5%-25%	70°	A	C		50%	70°	C	C	C
Nickel Chloride Solution	70°	A ^{1A}	C	B	25%	Boiling	A	C		50%	Boiling	C	C	C
Nitrating Solution	Cold & Hot	B		B	Potassium Ferrocyanide, 5%	70°	A	C		Concentrated	70°	A ^{1A}	C	B
Nickel Sulphate	Cold & Hot	A	C	A	Potassium Hydroxide, 5%	70°	A	C	B	Concentrated	Boiling	C	C	B
Nitric Acid					27%	Boiling	A	C	B	Concentrated	300°	C	C	B
5%-50%-70%	Boiling	A	C	C	50%	Boiling	B	C	C	Fuming	70°	C	C	B
65%	70°	A	C	C	Potassium Hypochlorite	70°	B	C	C	Sulphurous Acid, Saturated	70°	C	C	B
65%	Boiling	B	C	C	Potassium Nitrate					Saturated - 60 lbs. Pressure	250°	C	C	B
Concentrated	70°	A	C	C	1%-5% Still or Agitated	70°	A	C	B	Saturated - 70-125 lbs.	310°	C	C	B
Concentrated	Boiling	C	C	C	1%-5% Aerated	70°	A	C	B	150 lbs. Pressure	375°	C	C	B
Fuming Concentrated	70°-110°	A	C	C	50%	70°	A	C	B	Sulphurous Spray	70°	C	C	C
Fuming Concentrated	Boiling	C	C	C	50%	Boiling	A	C		Tannic Acid	70°	A	C	A
Nitrous Acid 5%	70°	A	C	C	Potassium Permanganate, 5%	70°	A	B			150°	A		A
Oil, Crude	Cold & Hot	A ¹			Potassium Sulphate					Tartaric Acid, 10%	70°	A	C	A
Oleic Acid	70°-400°	A ⁴	B	B	1%-5% Still or Agitated	70°	A	B		10%-50%	Boiling	B	C	A
5%-10%	70° & Boiling	A	C	B	1%-5% Aerated	70°	A	B	A	Trichloroacetic Acid	70°	C	C	B
10%	Boiling	C	C	B	Potassium Sulphide (Salt)		A ^{1A}	C		Trichloroethylene (Dry)	70°	A ⁴	C	A
25%-50%	Boiling	C	C	B	Sea Water	70°	A ^{1A}	C	B	(Moist)				B
Phenol (See Carboic Acid)					Sewage		A		A	Water		A	B	A
Petroleum Ether		A	B		Silver Bromide		B ⁴	C	C	Zinc Chloride, 5% Still	70°	A ^{1A}	C	C
					Silver Chloride		C ^{1A}	C	C		Boiling	B ^{1A}	C	C
					Silver Nitrate		A	C	C	Zinc Cyanide (Moist)	70°	A	C	
					Sodium Acetate (Moist)		A ⁴	C		Zinc Nitrate, Solution	Hot	A	C	
					Sodium Bicarbonate					Zinc Sulphate, 5%	70°	A	C	B
					All Concentrations	70°	A	C	B	25%	Boiling	A	C	B
					5%	150°	A	C	B	Saturated	70°	A	C	B
					Sodium Bisulphate, Solution	70°	A	C	B					
					Saturated Solution	70°	C	C	B					
					2g. + 1g. H ₂ SO ₄ liter	80°	C	C	B					