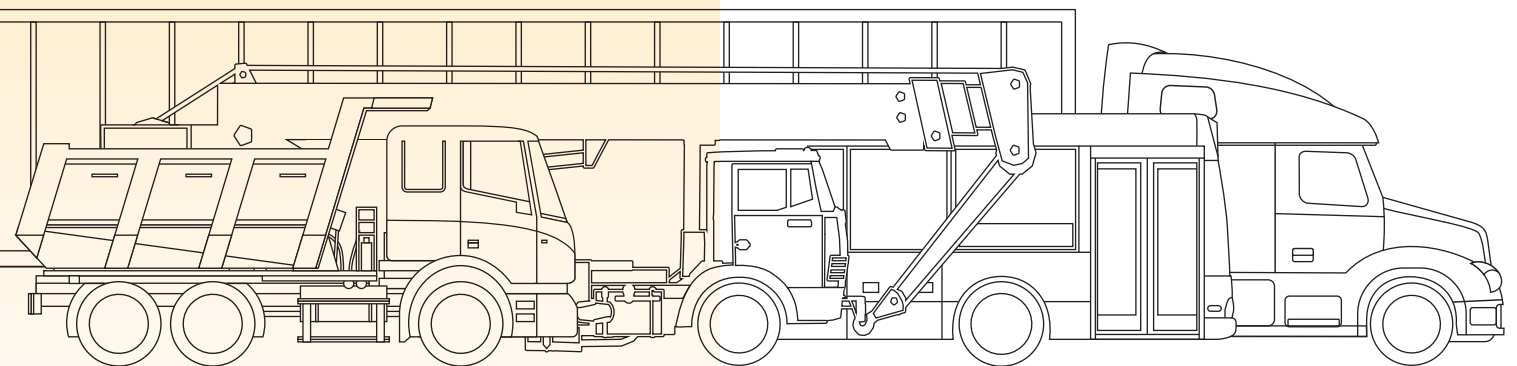


# Standards & Approvals, Alphanumeric Index

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# Performance Standards and Specifications

Hose	SAE J517	SAE Other	DOT FMVSS 106	USCG MTH (1)	ISO	DNV (2)	EN	MSHA (3)	German Lloyd	ABS	UL-21 LPG	BV	Other
AX		J1942		H				X					
BXX		J1942		H				X					
F42													
JK	100R2AT				ISO 1436-1 Type 2SN		EN 853 Type 2 SN	X					1J100, NFPA 1936
MX	100R1AT	J1942		H				X					
P35	100R13	J1942		HF	ISO 3862-1 Type R13	X	EN 853 Type R13	X		X		X	
SS23CG											X		CAN/CGA-8.1-M86 Type III, ECE 110 Class 1
SS25UL											X		AGA - AS/NZS 1869D
201	100R5	J1402 All	All										
206	100R5	J1402 All	All										
213		J1402 All	All										
221FR (4)		J1527 R3, J1942, USCG A1		H, HF	ISO 7840			X	X	X			ABYC
244		J2064 Type B											
266		J1402 All	All										
285		J2064 Type C											
293		J1402 All	All										
301LT		J1942		HF		X				X			
302	100R2AT	J1942		HF	ISO 1436-1 Type 2SN	X	EN 853 Type 2 SN			X		X	
304													
351ST	100R19							X					
351TC	100R19							X					
422	100R1AT	J1942		HF	ISO 1436-1 Type 1SN	X	EN 853 Type 1SN			X			
424													
426	100R1AT	J1942		HF				X		X			
431		J1942		H				X					
436		J1942		HF				X		X			
451ST	100R17							X					
451TC	100R17	J1942		HF				X		X			
471ST					ISO 11237-1 Type 2SC		EN857 Type 2SC	X					
471TC		J1942		HF	ISO 11237-1 Type 2SC	X	EN857 Type 2SC	X		X		X	
472LT							EN857 Type 2SC						
472TC		J1942		HF	ISO 11237-1 Type 2SC	X	EN857 Type 2SC	X		X			
482ST	100R1AT				ISO 1436-1 Type 1SN		EN853 Type 1SN	X					
601	100R3	J1942		H	ISO 4079 Type R3		EN854-Type R3	X					

*Continued*

**KEY TO UNDERSTANDING AGENCY APPROVALS FOR BUILDING HOSE ASSEMBLIES**

ABS Approved assemblies can be manufactured at any location with Parker's permission. No restrictions.

DNV Approved assemblies can only be manufactured in a Parker approved location that demonstrates a quality system and management program is in place and must be audited by DNV. Each location must be granted a "license" issued by Parker HPD for building hose assemblies. Three exist today; Davenport Iowa, Grimsby Canada, and Yangsan Korea.

BV Approved assemblies can only be produced in a BV approved location that demonstrates a quality system and management program is in place. Each location must have an initial audit performed by BV before the "license" can be issued. Additionally, ongoing audits setup by BV will be required at each approved location. Davenport Iowa is our only approved assembler.

UL "Listed" Assemblies must be made at Davenport Iowa

CSA/CGA Assemblies must be made at Davenport Iowa



## Performance Standards and Specifications (Continued)

Hose	SAE J517	SAE Other	DOT FMVSS 106	USCG MTH (1)	ISO	DNV (2)	EN	MSHA (3)	German Lloyd	ABS	UL-21 LPG	BV	Other
611HT	100R6						EN854	X					
701		J1942		H, HF	ISO 3862-1 Type 4SP		EN856-Type 4SP			X			
711		J1942		HF		X		X		X			
721	100R12				ISO 3862-1 Type R12		EN856-Type R12	X					
721ST	100R12				ISO 3862		EN856	X					
721TC	100R12	J1942		HF	ISO 3862-1 Type R12	X	EN856-Type R12	X		X			
722TC		J1942		HF		X		X		X			
731		J1942		HF		X	EN856-Type 4SH			X			
761								X					
772LT													
772ST	100R12				ISO 3862-1 Type R12		EN856-Type R12	X					
772TC	100R12	J1942		HF	ISO 3862-1 Type R12	X	EN856-Type R12	X		X			
774													
781	100R13	J1942		HF	ISO 3862-1 Type R13	X	EN856-Type R13	X		X			
782ST	100R13				ISO 3862-1 Type R13		EN856-Type R13	X					
782TC	100R13	J1942		HF	ISO 3862-1 Type R13	X	EN856-Type R13	X		X		X	
787TC		J1754, J1942		HF	ISO18752-DC	X		X		X			
791TC	100R15	J1942		HF	ISO 3862-1 Type R15	X		X		X			
792ST	100R15				ISO 3862-1 Type R15			X					
792TC	100R15	J1942		HF	ISO 3862-1 Type R15	X		X		X			
797TC		J1754, J1942		HF	ISO18752-DC	X		X		X			
801								X					
804													
811HT with 81		J1942		HF									
821													
821FR													
836								X					
881		J1942		H, HF				X					

**Notes:**

(1) U.S.C.G./MTH (Marine Technical & Hazardous Materials Branch) hoses, hose assemblies and appropriate fittings meet 46CFR56.60-25(c) for use on commercial vessels. Hoses and hose assemblies meet the requirements of SAE J1942. Hose fittings meet the requirements of SAE J1475.

F = Fuel and lube systems.

H = Hydraulic Systems.

\*Some hoses are accepted for different pressures for F and H. Also, not all sizes are accepted for all applications. See HPD approval bulletin #APR-004 or consult the Parker Hose Products Division, Technical Services Department, for details. The Canadian Coast Guard accepts all hoses accepted by the U.S. Coast Guard.

(2) Det Norske Veritas (DnV) approvals are with permanent (crimp) type fittings only. See HPD Approval Bulletin #APR-006 or consult the Parker Hose Products Division, Technical Services Department, for details.

(3) Hose with MSHA (Mine Safety and Health Administration) approved flame resistant cover will be marked accordingly on the layline.

(4) 221FR is type accepted by Lloyd's Register. It meets the requirements of the American Boat and Yacht council. 221FR is certified to meet the EC Directive 94/25/EC in accordance with ISO 7840.

For questions on standards and specifications please contact [www.parker.com](http://www.parker.com).

## Applicable Standards and Specifications for Hose Products

Many products listed in this catalog meet SAE, JIC, JIS, MSHA, Coast Guard, UL, and DOT Standards listed in this section. For standards not covered in this listing, consult [www.parker.com](http://www.parker.com).

Standard	Parker Part Number	Description
<b>SAE Standards – Hose Fittings</b>		
J516	All hose fittings used with hoses listed under SAE J517 standard.	
<b>SAE Standards – Adapters</b>		
J512, 010102	0104	45° Flare/Pipe
J512, 010103	0204	45° Flare/Pipe
J512, 010202	2104	45° Flare/Pipe
J512, 010203	2204	45° Flare/Pipe
J512, 010101	0404	45° Flare/45° Flare
J512, 040105	1404	45° Flare/45° Flare
J512, 010302	3104	45° Flare/Pipe
J512, 010220	2504	45° Flare/Str. Thrd. O-Ring
<b>All 37° Flared Hose Adapters Meet JIC and ASME Standards.</b>		
J514, 070101	0303	37° Flare/37° Flare
J514, 070102	0103	37° Flare/Pipe
J514, 070103	0203	37° Flare/Pipe
J514, 070109	03P	37° Flare/Plug
J514, 070110	06B	Short Nut
J514, 070112	06C	Cap Nut
J514, 070115	06S	Tube Sleeve
J514, 0701180	53N	Lock Nut
J514, 070119	03L3	37° Flare/37° Flare
J514, 070122L	5303	37° Flare/Str. Thrd. O-Ring
J514, 070122L	05L3	37° Flare/Str. Thrd. O-Ring
J514, 070123	0603	37° Flare/Flare Swivel
J514, 070201	2303	37° Flare/37° Flare
J514, 070203	2203	37° Flare/Pipe
J514, 070220	2503	37° Flare/Str. Thrd. O-Ring
J514, 070221	3903	37° Flare/Str. Thrd. O-Ring
J514, 070302	3103	37° Flare/Pipe
J514, 070320	3503	37° Flare/Str. Thrd. O-Ring
J514, 070321	3703	37° Flare/37° Flare Swivel
J514, 070401	033T	37° Flare/37° Flare
J514, 070424	013T	37° Flare/Pipe
J514, 070425	213T	37° Flare/Pipe
J514, 070426	023T	37° Flare/Pipe
J514, 070427	223T	37° Flare/Pipe
J514, 070428	053T	37° Flare/Str. Thrd. O-Ring
J514, 070429	253T	37° Flare/Str. Thrd. O-Ring
J514, 070432	063T	37° Flare/37° Flare Swivel
J514, 070433	393T	37° Flare/37° Flare Swivel

Standard	Parker Part Number	Description
<b>SAE Standards – Adapters (Continued)</b>		
J514, 070501	033X	37° Flare/37° Flare
J514, 070502	5603	37° Flare/Pipe
J514, 070601	0353	37° Flare/37° Flare Bulkhead
J514, 070701	2343	37° Flare/37° Flare Bulkhead
J514, 070801	3353	37° Flare/37° Flare Bulkhead
J514, 090109	05CP	Str. Thrd. O-Ring Plug
J514, 070202	2103	37° Flare/37° Flare
J514, 070603	0253	37° Flare/37° Flare
J514, 070958	533T	37° Flare/37° Flare
J514, 070959	543T	37° Flare/37° Flare
J514, 071602	5703	37° Flare/Pipe
J514, 090136	0510	Str. Thrd. O-Ring
J514, 090109B	05HP	Str. Thrd. O-Ring/Hex Plug
J514, 080110	11N	Flareless Nut
J514, 080102	0111	Flareless Adapter
J514, 080115A	11S	Flareless Ferrule
J514, 140137	0101	Pipe Nipple
J514, 140138	0202	Pipe/Pipe
J514, 140139	0201	Pipe/Pipe
J514, 140140	0102	Pipe Reducer
J514, 140238	2202	Pipe/Pipe
J514, 140239	2102	Pipe/Pipe
J514, 140338	4202	Pipe/Pipe
J514, 140339	3102	Pipe/Pipe
J514, 140424	012T	Pipe/Pipe
J514, 140425	212T	Pipe/Pipe
J514, 140438	022T	Pipe/Pipe
J514, 140109P	01HP	Pipe Plug
J514, 140109E	01CP	Pipe Plug
J514, 140237	2101	Pipe/Pipe
J514, 140538	212T	Pipe/Pipe
J516, 140157	0507	Str. Thrd. O-Ring/Pipe Swivel
J516, 140231	2207	Pipe/Pipe Swivel
J516, 140257	2507	Str. Thrd. O-Ring/Pipe Swivel
J516, 140357	3507	Str. Thrd. O-Ring/Pipe Swivel
J516, 140130	0107	Pipe/Pipe Swivel
J516, 140131	0207	Pipe/Pipe Swivel
J516, 140230	2107	Pipe/Pipe Swivel
J516, 140330	3107	Pipe/Pipe Swivel

# Standards & Approvals

## Applicable Standards for Industrial Hose Products By Standard Number

Industry Stds*	CARB	EPA	ISO 1307-1997	SAE								TMC RP303B
				J20R1 A	J20R2 A	J20R2 D-1	J20R3 A	J20R3EC D-2	J30R7	J30R14 T2	J2006	
Hose Series**	389	389	6620	6620	6621	7395 (Performance)	6722	7181	389	389	ES269	6620
	397	397	6621	6750	6623		6723		395	397 (Performance)	SS269	6621 (Performance)
			6623	6751			6724		397 (Performance)		SW569	6623
			6635									

\*Industry and/or Governmental Organizations

\*\* See product pages for details.

CARB California Air Resource Board  
 EPA Environmental Protection Agency  
 ISO International Standards Organization  
 SAE Society of Automotive Engineers  
 TMC

## Applicable Standards For Parflex Products

Agency and Specifications	Approved Parflex Products
<b>Flame Resistance:</b>	
MSHA	D6R, 560, 590 (except -3), 510C (except -4), 540N, 56DH, HLB
UL94HB	83FR NN, NB, NNR, NBR (wall thickness above 0.033", contact Parflex for availability)
<b>Natural Gas Service:</b>	
For Vehicles and Dispensing Systems ANSI IAS NGV4.2 - CSA 12.52	5CNG
European Safety Standard (TUV) Kraftfahrt-Bundesamt ECE R110	5CNG-3, 5CNG-8 (Assemblies from Parker Polyflex Europe Only)
<b>Hydraulic Service:</b>	
SAE 100R1	560
SAE 100R2	590
SAE 100R7	540N, 548N, 510C, 518C
SAE 100R14	919
SAE 100R14B	919B
SAE 100R16	590
SAE 100R17	D6R
<b>WASTEC WRP05-1996 (check revision):</b>	
Waste Equipment Technology Association	S4, S5, S6, S9
<b>Transportation Standards:</b>	
SAE J844, FMVSS106 (49CFR571.106)	1120A, 1120B, BRAKCOIL®, SliderCoil™
<b>Electrical, Non-Conductivity:</b>	
SAE J517	518C, 548N, 568DH
<b>DNV (with approved fittings only):</b>	
Det Norske (Norwegian) Veritas Marine Steel Ships, Mobile Offshore and Fixed Offshore Drilling Units	520N, 580N, 588N, H580N, 518C, 540N, 573X, 575X, 590, 593, 560
<b>American Bureau of Shipping (ABS):</b>	
Product Design Assessment	590-4, 590-6, 590-8

## Applicable Standards For Tube Fittings Products by Standard Number

Standard	Description
ASTM A269	Seamless and welded type 316 Stainless Steel tubing
ASTM B633	Zinc plating
ASTM F1387	Mechanically attached fittings — Triple-Lok, Ferulok and Seal-Lok
DIN 2353	24° cone compression (bite-type) fitting range (configurations)
DIN 3852-1	Metric parallel thread port (ISO 9974-1)
DIN 3852-2	BSPP parallel thread port (ISO 1179-1)
DIN 3852-3	Metric O-ring port (ISO 6149-1)
DIN 3861	24° cone machining and sleeve for compression (bite-type) fittings
DIN 3865	24° cone nipple with O-ring
DIN 3859	Technical delivery conditions for compression fittings
DIN 1630	Seamless steel tube
DIN 2391	Seamless precision steel tubes
DIN 17458	Stainless steel tubes
ISO 1179	BSPP, flat face port and stud ends – same as DIN 3852 - Part 2
ISO 3304	Seamless precision steel tubes
ISO 3305	Welded precision steel tubes
ISO 6149	Metric straight thread O-ring port and stud ends – same as SAE J2244 and DIN 3852, Part 3
ISO 6162	Four bolt split flange connections – inch and metric bolts (inch bolt, Part II – same as SAE J518)
ISO 8434-1	24° cone bite type fittings (EO fittings)
ISO 8434-2	Metric 37° flare fittings (Metric Triple-Lok)
ISO 8434-3	Metric face seal fitting with ISO 6149 port end – (Metric Seal-Lok)
ISO 8434-4	24° cone bite type fittings with weld nipple (EO Fittings)
ISO 19879	Test methods for threaded fluid connectors
SIO 8434-6	60° cone connectors with BSPP threads
ISO 9974	Metric flat face port and stud ends – same as DIN 3852 - Part 1
JIS B8363	60° cone (male and female) hose adapters
MIL-16142	UN/UNF straight thread O-ring port – same as SAE J1926-1
MIL-F-18866	37° flare and flareless tube fittings – Triple-Lok and Ferulok (dimensionally similar to SAE J514)

Standard	Description
MIL-33649	Straight thread O-ring port – different from SAE J1926-1
NFPA T3.8.32	Test methods for steel separable tube fittings
SAE J343	Tests and procedures for hose and hose assemblies (impulse test applies to fittings)
SAE J356	Welded and flash controlled low carbon steel tubing
SAE J512	Automotive tube fittings - 45° flare type - Inverted flare type - Tapered sleeve compression type
SAE J514	Hydraulic tube fittings - 37° flare (Triple-Lok) - Flareless - 24° bite type (Ferulok) - O-ring plugs - Pipe fittings - Adapter unions (pipe swivel – “07” adapters)
SAE J515	Hydraulic O-rings (SAE straight thread, face seal, four-bolt split flange, and metric O-ring port)
SAE J518	Code 61 and 62 four-bolt split flange connections – (same as ISO 6162 Type II flange connection)
SAE J524	Seamless low carbon steel tubing
SAE J525	Welded and cold drawn low carbon steel tubing
SAE J527	Brazed double wall steel tubing
SAE J528	Seamless copper tube
SAE J531	Automotive pipe, filler and drain plugs (HP and HHP plugs)
SAE J533	Flares for tubing – 37° and 45° single and double flares
SAE J846	Coding system for identification of fluid connectors
SAE J1065	Pressure ratings for hydraulic tubing
SAE J1231	Beaded tube hose fittings
SAE J1453	O-ring face seal fitting with SAE port end – (Seal-Lok)
SAE J1644	Test methods for fluid connectors
SAE J1926	SAE straight thread O-ring port and stud ends – same as ISO 11926
SAE J2244	Metric straight thread O-ring port and stud ends – same as ISO 6149
SAE J2435	Welded and flash controlled C-1021 tubing
SAE J2467	Welded and cold drawn, C-1021 tubing
SAE J2613	Welded and flash controlled high strength low alloy (HSLA) tubing
SAE J2614	Welded and cold drawn HSLA tubing

## Thread Designations and Document Standards for Threads Used in Fluid Connectors

Abbreviation	Description	Applicable Standards
<b>Straight Pipe</b>		
NPSC	American Standard Straight Pipe Threads in Pipe Couplings Couplings	ANSI B1.20.1 FED-STD-H28/7
NPSF	Dryseal American Standard Fuel Internal Straight Pipe Threads (generally used in soft or ductile materials to mate with NPTF external taper threads)	SAE J476 ANSI B1.20.3 FED-STD-H28/8
NPSI	Dryseal American Intermediate Internal Straight Pipe Threads (for brittle or hard materials; intended to mate with PTF-SAE short external taper threads)	SAE J476 ANSI B1.20.3 FED-STD-H28/8
NPSM	American Standard Straight Pipe Threads for Free-Fitting Mechanical Joints for Fixtures (these threads fit freely over NPTF threads. They are used in swivel nuts of 07 adapters)	ANSI B1.20.1 FED-STD-H28/7
<b>Taper Pipe</b>		
ANPT	Aeronautical National Taper Pipe Threads (similar to NPT with various additional requirements in gaging)	MIL-P-7105
NPT	American Standard Taper Pipe Threads for General Use	ANSI B1.20.1 FED-STD-H28/7
NPTF	Dryseal American Standard Taper Pipe Threads (used in all of our steel and brass fittings)	SAE J476 ANSI B1.20.3 FED-STD-H28/8
PTF — SAE Short	Dryseal SAE Short Taper Pipe Threads (mainly used in low pressure pneumatic and fuel applications)	SAE J476 ANSI B1.20.3 FED-STD-H28/8
PTF — SPL Short <sup>1)</sup>	Dryseal Special Short Taper Pipe Threads	ANSI B1.20.3
PTF — SPL Extra Short <sup>1)</sup>	Dryseal Special Extra Short Taper Pipe Threads	ANSI B1.20.3

Abbreviation	Description	Applicable Standards
<b>Unified Threads</b>		
UN	Unified Constant Pitch Threads (standard series: 4, 6, 8, 12, 16, 20, 28, 32)	ANSI B1.1 FED-STD-H28/2
UNC	Unified Coarse Threads	ANSI B1.1 FED-STD-H28/2
UNEF	Unified Extra Fine Threads	ANSI B1.1 FED-STD-H28/2
UNF	Unified Fine Threads	ANSI B1.1 FED-STD-H28/2
UNS	Unified Special Pitch Threads	ANSI B1.1 FED-STD-H28/3
UNJ	Unified Controlled Root Radius Threads	ANSI B1.15 FED-STD-H28/4
<b>Metric Threads</b>		
M	Metric Screw Threads — M profile	ISO 261 ANSI B1.13M FED-STD-H28/21
M — Keg	Metric Taper Threads (mainly used in Germany)	DIN 158
<b>British Standard Pipe Threads</b>		
R (BSPT)	British Standard Taper Pipe Threads, External	BS 21 ISO 7/1
Rc (BSPT)	British Standard Taper Pipe Threads, Internal	BS 21 ISO 7/1
Rp or G (BSPP)	British Standard Pipe (Parallel) Threads	BS 2779 ISO 228/1
<b>Japanese Standard Pipe Threads</b>		
PF <sup>2)</sup>	JIS Parallel Pipe Threads	JIS B202 ISO 228/1
PT <sup>2)</sup>	JIS Taper Pipe Threads	JIS B203 ISO 7/1
PS	JIS Parallel Internal Pipe Threads (to mate with PT threads)	JIS B203

1) Used in some pneumatic components where shortened thread depth is

required because of lack of enough material due to component size limitations.

2) PF and PT threads are functionally interchangeable with BSPP and BSPT threads, respectively. These are old designations. They are being replaced with G (for PF) and R and Rc (for PT) as documents are revised.



## Document Sources for Connector Specifications

**ANSI** American National Standards Institute  
11 West 42nd Street, 13th Floor  
New York, New York 10036-8002  
Phone: 212-642-4900  
Fax: 212-398-0023  
[www.ansi.org](http://www.ansi.org)

**FED-STD** Federal Standard  
Department of Defense Single Stock Point  
Commanding Officer  
Naval Publications and Forms Center  
5801 Taber Avenue  
Philadelphia, PA 19120-5099

**BSI** British Standards Institution  
389 Chiswick High Road  
London, W4 4AL  
United Kingdom  
Phone: 44-181-996-9000  
Fax: 44-181-996-7400  
<http://www.bsigroup.com/>

**ISO** International Organization for Standardization  
Case Postale 56  
1, Rue de Varembe  
CH - 1211 Geneve 20  
Switzerland  
<http://www.iso.org/>

**ISO Documents are also available from ANSI**

British Standards are also available from ANSI

**DIN** Deutsches Institut Fur Normung  
(German Institute for Standards)  
Burggrafenstrasse 6  
Postfach 1107  
D - 1000 Berlin 30, Germany  
<http://www.beuth.de/en/>

**JIS** Japanese Industrial Standards  
Published by Japanese Standards Association  
1-24 Akasaka 4  
Minto-ku, Tokyo 107-8440  
Japan  
Phone: 81-3-3583-8000  
Fax: 81-3-3586-2014

**English translations of some German Standards can be obtained from:**

**English translations of some Japanese Standards can be obtained from ANSI**

**ANSI**

**SAE**

— or —

**Global Engineering Documents**  
15 Inverness Way East  
Englewood, CO 80112-9660  
Phone: 1-800-854-7179

SAE International  
400 Commonwealth Drive  
Warrendale, PA 15096-0001  
Phone: 412-776-4841  
Fax: 412-776-0002  
<http://standards.sae.org/>



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0207	F89	2650	M38	6823	C6	11343	E22	16956	E35
0507	F89	2676	M38	6824	C6	11356	E34	17726	E18
0588	D19	2829	M13, M14	7181	A8	11543	E22	17743	E25
0688	D19	3005	L12	7186	A8	11571	E40	17926	E18
015301	M11	3009	L12	7219	A9	11577	E46	17943	E25
015306	M11	3010	L12	7236	A13	11643	E22	18971	E42
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45°

37° and 45° Flare  
Nose Angles

1/8"

1/4"

3/8"

1/2"

3/4"

1"

1-1/4"

1-1/2"

2"

2"  
-32

1-1/2"  
-24

1-1/4"  
-20

1"  
-16

7/8"  
-14

3/4"  
-12

5/8"  
-10

1/2"  
-8

3/8"  
-6

5/16"  
-5

1/4"  
-4

3/4"  
-12

3/8"  
-6

1/4"  
-4

SAE  
3/8"  
-6

5/16"  
-5

3/8"  
-6

1/2"  
-8

5/8"  
-10

3/4"  
-12

1"  
-16

SAE (JIC) Nut and Nipple  
(Hex Size)

2"  
-32

Code 61  
Split Flange  
O.D.

1-1/2"  
-24

1-1/4"  
-20

SAE (JIC) 37° Flare Nose Cone Sizes

Male Pipe Thread Sizes

# END FITTING SIZE CHART

SAE (JIC) 37° Flare Nose Cone Sizes

SAE 45° Flare  
Nose Cone Sizes

## PARKER-HANNIFIN CORPORATION

## OFFER OF SALE

The goods, services or work (referred to as the "Products") offered by Parker-Hannifin Corporation, its subsidiaries, groups, divisions, and authorized distributors ("Seller") are offered for sale at prices indicated in the offer, or as may be established by Seller. The offer to sell the Products and acceptance of Seller's offer by any customer ("Buyer") is contingent upon, and will be governed by all of the terms and conditions contained in this Offer of Sale. Buyer's order for any Products specified in Buyer's purchase document or Seller's offer, proposal or quote ("Quote") attached to the purchase order, when communicated to Seller verbally, or in writing, shall constitute acceptance of this offer.

**1. Terms and Conditions.** Seller's willingness to offer Products for sale or accept an order for Products is subject to the terms and conditions contained in this Offer of Sale or any newer version of the same, published by Seller electronically at [www.parker.com/saleterms/](http://www.parker.com/saleterms/). Seller objects to any contrary or additional terms or conditions of Buyer's order or any other document or other communication issued by Buyer.

**2. Price; Payment.** Prices stated on Seller's Quote are valid for thirty (30) days, except as explicitly otherwise stated therein, and do not include any sales, use, or other taxes or duties unless specifically stated. Seller reserves the right to modify prices to adjust for any raw material price fluctuations. Unless otherwise specified by Seller, all prices are F.C.A. Seller's facility (INCOTERMS 2010). Payment is subject to credit approval and payment for all purchases is due thirty (30) days from the date of invoice (or such date as may be specified by Seller's Credit Department). Unpaid invoices beyond the specified payment date incur interest at the rate of 1.5% per month or the maximum allowable rate under applicable law.

**3. Shipment; Delivery; Title and Risk of Loss.** All delivery dates are approximate. Seller is not responsible for damages resulting from any delay. Regardless of the manner of shipment, delivery occurs and title and risk of loss or damage pass to Buyer, upon placement of the Products with the shipment carrier at Seller's facility. Unless otherwise stated, Seller may exercise its judgment in choosing the carrier and means of delivery. No deferral of shipment at Buyers' request beyond the respective dates indicated will be made except on terms that will indemnify, defend and hold Seller harmless against all loss and additional expense. Buyer shall be responsible for any additional shipping charges incurred by Seller due to Buyer's acts or omissions.

**4. Warranty.** Seller warrants that the Products sold hereunder shall be free from defects in material or workmanship for a period of twelve (12) months from the date of delivery or 2,000 hours of normal use, whichever occurs first. All prices are based upon the exclusive limited warranty stated above, and upon the following disclaimer: **DISCLAIMER OF WARRANTY: THIS WARRANTY IS THE SOLE AND ENTIRE WARRANTY PERTAINING TO PRODUCTS PROVIDED. SELLER DISCLAIMS ALL OTHER WARRANTIES, EXPRESS AND IMPLIED, INCLUDING DESIGN, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.**

**5. Claims; Commencement of Actions.** Buyer shall promptly inspect all Products upon receipt. No claims for shortages will be allowed unless reported to the Seller within ten (10) days of delivery. No other claims against Seller will be allowed unless asserted in writing within thirty (30) days after delivery. Buyer shall notify Seller of any alleged breach of warranty within thirty (30) days after the date the defect is or should have been discovered by Buyer. Any claim or action against Seller based upon breach of contract or any other theory, including tort, negligence, or otherwise must be commenced within twelve (12) months from the date of the alleged breach or other alleged event, without regard to the date of discovery.

**6. LIMITATION OF LIABILITY.** IN THE EVENT OF A BREACH OF WARRANTY, SELLER WILL, AT ITS OPTION, REPAIR OR REPLACE A DEFECTIVE PRODUCT, OR REFUND THE PURCHASE PRICE WITHIN A REASONABLE PERIOD OF TIME. **IN NO EVENT IS SELLER LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF, OR AS THE RESULT OF, THE SALE, DELIVERY, NON-DELIVERY, SERVICING, USE OR LOSS OF USE OF THE PRODUCTS OR ANY PART THEREOF, OR FOR ANY CHARGES OR EXPENSES OF ANY NATURE INCURRED WITHOUT SELLER'S WRITTEN CONSENT, WHETHER BASED IN CONTRACT, TORT OR OTHER LEGAL THEORY. IN NO EVENT SHALL SELLER'S LIABILITY UNDER ANY CLAIM MADE BY BUYER EXCEED THE PURCHASE PRICE OF THE PRODUCTS.**

**7. User Responsibility.** The user, through its own analysis and testing, is solely responsible for making the final selection of the system and Product and assuring that all performance, endurance, maintenance, safety and warning requirements of the application are met. The user must analyze all aspects of the application and follow applicable industry standards and Product information. If Seller provides Product or system options based upon data or specifications provided by the user, the user is responsible for determining that such data and specifications are suitable and sufficient for all applications and reasonably foreseeable uses of the Products or systems.

**8. Loss to Buyer's Property.** Any designs, tools, patterns, materials, drawings, confidential information or equipment furnished by Buyer or any other items which become Buyer's property, will be considered obsolete and may be destroyed by Seller after two (2) consecutive years have elapsed without Buyer ordering the items manufactured using such property. Seller shall not be responsible for any loss or damage to such property while it is in Seller's possession or control.

**9. Special Tooling.** A tooling charge may be imposed for any special tooling, including without limitation, dies, fixtures, molds and patterns, acquired to manufacture Products. Such special tooling shall be and remain Seller's property notwithstanding payment of any charges by Buyer. In no event will Buyer acquire any interest in apparatus belonging to Seller which is utilized in the manufacture of the Products, even if such apparatus has been specially converted or adapted for such manufacture and notwithstanding any charges paid by Buyer. Unless otherwise agreed, Seller has the right to alter, discard or otherwise dispose of any special tooling or other property in its sole discretion at any time.

**10. Buyer's Obligation; Rights of Seller.** To secure payment of all sums due or otherwise, Seller retains a security interest in all Products delivered to Buyer and this agreement is deemed to be a Security Agreement under the Uniform Commercial Code. Buyer authorizes Seller as its attorney to execute and file on Buyer's behalf all documents Seller deems necessary to perfect its security interest.

**11. Improper Use and Indemnity.** Buyer shall indemnify, defend, and hold Seller harmless from any losses, claims, liabilities, damages, lawsuits, judgments and costs (including attorney fees and defense costs), whether for personal injury, property damage, patent, trademark or copyright

infringement or any other claim, brought by or incurred by Buyer, Buyer's employees, or any other person, arising out of: (a) improper selection, application, design, specification or other misuse of Products purchased by Buyer from Seller; (b) any act or omission, negligent or otherwise, of Buyer; (c) Seller's use of patterns, plans, drawings, or specifications furnished by Buyer to manufacture Products; or (d) Buyer's failure to comply with these terms and conditions. Seller shall not indemnify Buyer under any circumstance except as otherwise provided.

**12. Cancellations and Changes.** Buyer may not cancel or modify or cancel any order for any reason, except with Seller's written consent and upon terms that will indemnify, defend and hold Seller harmless against all direct, incidental and consequential loss or damage. Seller may change Product features, specifications, designs and availability.

**13. Limitation on Assignment.** Buyer may not assign its rights or obligations under this agreement without the prior written consent of Seller.

**14. Force Majeure.** Seller does not assume the risk and is not liable for delay or failure to perform any of Seller's obligations by reason of events or circumstances beyond its reasonable control (hereinafter "Events of Force Majeure"). Events of Force Majeure shall include without limitation: accidents, strikes or labor disputes, acts of any government or government agency, acts of nature, delays or failures in delivery from carriers or suppliers, shortages of materials, or any other cause beyond Seller's reasonable control.

**15. Waiver and Severability.** Failure to enforce any provision of this agreement will not invalidate that provision; nor will any such failure prejudice Seller's right to enforce that provision in the future. Invalidation of any provision of this agreement by legislation or other rule of law shall not invalidate any other provision herein. The remaining provisions of this agreement will remain in full force and effect.

**16. Termination.** Seller may terminate this agreement for any reason and at any time by giving Buyer thirty (30) days prior written notice. Seller may immediately terminate this agreement, in writing, if Buyer: (a) breaches any provision of this agreement (b) appoints a trustee, receiver or custodian for all or any part of Buyer's property (c) files a petition for relief in bankruptcy on its own behalf, or one if filed by a third party (d) makes an assignment for the benefit of creditors; or (e) dissolves its business or liquidates all or a majority of its assets.

**17. Governing Law.** This agreement and the sale and delivery of all Products are deemed to have taken place in, and shall be governed and construed in accordance with, the laws of the State of Ohio, as applicable to contracts executed and wholly performed therein and without regard to conflicts of laws principles. Buyer irrevocably agrees and consents to the exclusive jurisdiction and venue of the courts of Cuyahoga County, Ohio with respect to any dispute, controversy or claim arising out of or relating to this agreement.

**18. Indemnity for Infringement of Intellectual Property Rights.** Seller is not liable for infringement of any patents, trademarks, copyrights, trade dress, trade secrets or similar rights except as provided in this Section. Seller will defend and indemnify Buyer against allegations of infringement of U.S. patents, U.S. trademarks, copyrights, trade dress and trade secrets ("Intellectual Property Rights"). Seller will defend at its expense and will pay the cost of any settlement or damages awarded in an action brought against Buyer based on an allegation that a Product sold pursuant to this agreement infringes the Intellectual Property Rights of a third party. Seller's obligation to defend and indemnify Buyer is contingent on Buyer notifying Seller within ten (10) days after Buyer becomes aware of such allegations of infringement, and Seller having sole control over the defense of any allegations or actions including all negotiations for settlement or compromise. If a Product is subject to a claim that it infringes the Intellectual Property Rights of a third party, Seller may, at its sole expense and option, procure for Buyer the right to continue using the Product, replace or modify the Product so as to make it noninfringing, or offer to accept return of the Product and refund the purchase price less a reasonable allowance for depreciation. Notwithstanding the foregoing, Seller is not liable for claims of infringement based on information provided by Buyer, or directed to Products delivered hereunder for which the designs are specified in whole or part by Buyer, or infringements resulting from the modification, combination or use in a system of any Product sold hereunder. The foregoing provisions of this Section constitute Seller's sole and exclusive liability and Buyer's sole and exclusive remedy for infringement of Intellectual Property Rights.

**19. Entire Agreement.** This agreement contains the entire agreement between the Buyer and Seller and constitutes the final, complete and exclusive expression of the terms of sale. All prior or contemporaneous written or oral agreements or negotiations with respect to the subject matter are herein merged. The terms contained herein may not be modified unless in writing and signed by an authorized representative of Seller.

**20. Compliance with Laws.** Buyer agrees to comply with all applicable laws, regulations, and industry and professional standards of care, including those of the United Kingdom, the United States of America, and the country or countries in which Buyer may operate, including without limitation the U. K. Bribery Act, the U.S. Foreign Corrupt Practices Act ("FCPA"), the U.S. Anti-Kickback Act ("Anti-Kickback Act") and the U.S. Food Drug and Cosmetic Act ("FDCA"), each as currently amended, and the rules and regulations promulgated by the U.S. Food and Drug Administration ("FDA"), and agrees to indemnify and hold harmless Seller from the consequences of any violation of such provisions by Buyer, its employees or agents. Buyer acknowledges that it is familiar with the provisions of the U. K. Bribery Act, the FCPA, the FDA, and the Anti-Kickback Act, and certifies that Buyer will adhere to the requirements thereof. In particular, Buyer represents and agrees that Buyer will not make any payment or give anything of value, directly or indirectly to any governmental official, any foreign political party or official thereof, any candidate for foreign political office, or any commercial entity or person, for the purpose of influencing such person to purchase Products or otherwise benefit the business of Seller.

# Parker's Industrial Segment — Global Technology Platforms



## Product Groups

Hydraulics	Automation	Fluid Connectors	Instrumentation	Filtration	Engineered Materials*
<p><b>Key Markets</b></p> <ul style="list-style-type: none"> <li>Aerial lift</li> <li>Agriculture</li> <li>Air conditioning</li> <li>Construction machinery</li> <li>Entertainment</li> <li>Forestry</li> <li>Industrial machinery</li> <li>Machine tools</li> <li>Marine</li> <li>Material handling</li> <li>Mining</li> <li>Oil &amp; gas</li> <li>Power generation</li> <li>Recreational vehicles</li> <li>Refuse vehicles</li> <li>Renewable energy</li> <li>Truck hydraulics</li> <li>Turf equipment</li> </ul> <p><b>Key Products</b></p> <ul style="list-style-type: none"> <li>Accumulators</li> <li>Cartridge valves</li> <li>Coolers</li> <li>Electrohydraulic actuators</li> <li>Electronic displays &amp; HMIs</li> <li>Electronic I/O controllers</li> <li>Fan drives</li> <li>Hybrid drives</li> <li>Hydraulic cylinders</li> <li>Hydraulic motors &amp; pumps</li> <li>Hydraulic systems</li> <li>Hydraulic valves &amp; controls</li> <li>Hydrostatic steering</li> <li>Integrated hydraulic circuits</li> <li>Intensifiers</li> <li>Power take-offs</li> <li>Power units</li> <li>Rotary actuators</li> <li>Sensors</li> <li>Telematic controllers</li> </ul>	<p><b>Key Markets</b></p> <ul style="list-style-type: none"> <li>Automotive</li> <li>Conveyor &amp; material handling</li> <li>Factory automation</li> <li>Fluid controls</li> <li>Food &amp; beverage</li> <li>Industrial machinery</li> <li>Life sciences</li> <li>Machine tools</li> <li>Medical</li> <li>Mobile</li> <li>Oil &amp; gas</li> <li>Packaging machinery</li> <li>Paper machinery</li> <li>Plastics machinery</li> <li>Primary metals</li> <li>Process</li> <li>Renewable energy</li> <li>Safety &amp; security</li> <li>Semiconductor &amp; electronics</li> <li>Transportation</li> </ul> <p><b>Key Products</b></p> <ul style="list-style-type: none"> <li>AC/DC drives &amp; systems</li> <li>Air preparation</li> <li>Diesel Emissions Products</li> <li>Electric actuators, gantry robots &amp; slides</li> <li>Human machine interfaces</li> <li>Inverters</li> <li>Manifolds</li> <li>Miniature fluidics</li> <li>Pneumatic actuators &amp; grippers</li> <li>Pneumatic valves &amp; controls</li> <li>Rotary actuators</li> <li>Solenoid valves</li> <li>Stepper motors, servo motors, drives &amp; controls</li> <li>Structural extrusions</li> <li>Vacuum generators, cups &amp; sensors</li> <li>Valves</li> </ul>	<p><b>Key Markets</b></p> <ul style="list-style-type: none"> <li>Aerial lift</li> <li>Agriculture</li> <li>Bulk chemical handling</li> <li>Construction machinery</li> <li>Food &amp; beverage</li> <li>Fuel &amp; gas delivery</li> <li>Industrial machinery</li> <li>Life sciences</li> <li>Marine</li> <li>Mining</li> <li>Mobile</li> <li>Oil &amp; gas</li> <li>Renewable energy</li> <li>Transportation</li> </ul> <p><b>Key Products</b></p> <ul style="list-style-type: none"> <li>Check valves</li> <li>Connectors for low pressure fluid conveyance</li> <li>Deep sea umbilicals</li> <li>Diagnostic equipment</li> <li>Hose couplings</li> <li>Industrial hose</li> <li>Mooring systems &amp; power cables</li> <li>PTFE hose &amp; tubing</li> <li>Quick couplings</li> <li>Rubber &amp; thermoplastic hose</li> <li>Tube fittings &amp; adapters</li> <li>Tubing &amp; plastic fittings</li> </ul>	<p><b>Key Markets</b></p> <ul style="list-style-type: none"> <li>Air conditioning</li> <li>Alternative fuels</li> <li>Biopharmaceuticals</li> <li>Chemical</li> <li>Food &amp; beverage</li> <li>Industrial refrigeration</li> <li>Life sciences</li> <li>Microelectronics</li> <li>Mining</li> <li>Oil &amp; gas</li> <li>Pharmaceuticals</li> <li>Power generation</li> <li>Precision cooling</li> <li>Refining</li> <li>Refrigeration</li> <li>Water/wastewater</li> </ul> <p><b>Key Products</b></p> <ul style="list-style-type: none"> <li>Accumulators</li> <li>Analytical instruments &amp; sample conditioning systems</li> <li>CNG dispensers</li> <li>CO2 controls</li> <li>Electronic controllers</li> <li>Electronic valves</li> <li>Filter driers</li> <li>Fluid system fittings, valves, regulators &amp; manifold valves</li> <li>Fluid system mass flow meters/ controllers</li> <li>Fluoropolymer chemical delivery fittings, valves &amp; pumps</li> <li>High pressure fittings, valves, pumps &amp; systems</li> <li>High purity gas delivery fittings, valves, regulators</li> <li>Medical devices</li> <li>Natural gas on-board fuel systems</li> <li>Pressure regulating valves</li> <li>Refrigeration electronic controls &amp; monitoring</li> <li>Safety relief valves</li> <li>Thermostatic &amp; electronic expansion valves</li> </ul>	<p><b>Key Markets</b></p> <ul style="list-style-type: none"> <li>Aerospace</li> <li>Food &amp; beverage</li> <li>Industrial machinery</li> <li>Life sciences</li> <li>Marine</li> <li>Mobile</li> <li>Oil &amp; gas</li> <li>Power generation</li> <li>Renewable energy</li> <li>Transportation</li> <li>Water purification</li> </ul> <p><b>Key Products</b></p> <ul style="list-style-type: none"> <li>Analytical gas generators</li> <li>Aviation fuel filters</li> <li>Compressed air &amp; gas treatment solutions</li> <li>Engine fuel, oil, air &amp; CCV filtration systems</li> <li>Fluid condition monitoring systems</li> <li>Hydraulic &amp; lubrication filters</li> <li>Instrumentation filters</li> <li>Liquid, air and gas filters</li> <li>Membrane &amp; fiber filters</li> <li>Nitrogen &amp; hydrogen generators</li> <li>Sterile air filtration</li> <li>Water desalination and purification filters &amp; systems</li> </ul>	<p><b>Key Markets</b></p> <ul style="list-style-type: none"> <li>Aerospace</li> <li>Chemical processing</li> <li>Consumer</li> <li>Fluid power</li> <li>General industrial</li> <li>Information technology</li> <li>Life sciences</li> <li>Microelectronics</li> <li>Military</li> <li>Oil &amp; gas</li> <li>Power generation</li> <li>Renewable energy</li> <li>Telecommunications</li> <li>Transportation</li> </ul> <p><b>Key Products</b></p> <ul style="list-style-type: none"> <li>Dynamic seals</li> <li>Elastomeric o-rings</li> <li>Electro-medical instrument design &amp; assembly</li> <li>EMI shielding</li> <li>Extruded &amp; precision-cut, fabricated elastomeric seals</li> <li>High temperature metal seals</li> <li>Homogeneous &amp; inserted elastomeric shapes</li> <li>Medical device fabrication &amp; assembly</li> <li>Metal &amp; plastic retained composite seals</li> <li>Shielded optical windows</li> <li>Silicone tubing &amp; extrusions</li> <li>Thermal management</li> <li>Vibration dampening</li> </ul> <p><small>*The Engineered Materials Group was formerly known as the Seal Group.</small></p>

# Parker's Aerospace Systems Segment — Global Technology Platforms

Aerospace			
	<p><b>Key Markets</b></p> <ul style="list-style-type: none"> <li>Aftermarket services</li> <li>Business jets</li> <li>Commercial transports</li> <li>Engines</li> <li>General aviation</li> <li>Helicopters</li> <li>Military aircraft</li> <li>Missiles</li> <li>Power generation</li> <li>Regional transports</li> <li>Unmanned aerial vehicles</li> </ul>	<p><b>Key Products</b></p> <ul style="list-style-type: none"> <li>Control actuation systems &amp; components</li> <li>Engine systems &amp; components</li> <li>Fluid conveyance systems &amp; components</li> <li>Fluid metering, delivery &amp; atomization devices</li> <li>Fuel systems &amp; components</li> <li>Fuel tank inerting systems</li> </ul>	<ul style="list-style-type: none"> <li>Hydraulic systems &amp; components</li> <li>Lubrication components</li> <li>Power conditioning &amp; management systems</li> <li>Thermal management</li> <li>Wheels &amp; brakes</li> </ul>
<p><b>Product Group</b></p> <p><b>Aerospace</b></p>			



# Parker Fluid Connectors Group

## North American Divisions & Distribution Service Centers

**Your complete source** for quality tube fittings, hose & hose fittings, brass & composite fittings, quick-disconnect couplings, valves and assembly tools, locally available from a worldwide network of authorized distributors.

### **Fittings:**

Available in inch and metric sizes covering SAE, BSP, DIN, GAZ, JIS and ISO thread configurations, manufactured from steel, stainless steel, brass, aluminum, nylon and thermoplastic.

### **Hose, Tubing and Bundles:**

Available in a wide variety of sizes and materials including rubber, wire-reinforced, thermoplastic, hybrid and custom compounds.

### **Worldwide Availability:**

Parker operates Fluid Connectors manufacturing locations and sales offices throughout North America, South America, Europe and Asia-Pacific.

**For information**, call toll free...

**1-800-C-PARKER**  
**(1-800-272-7537)**

## **North American Divisions**

### **Fluid System Connectors Division**

Otsego, MI  
phone 269 694 9411  
fax 269 694 4614

### **Hose Products Division**

Wickliffe, OH  
phone 440 943 5700  
fax 440 943 3129

### **Industrial Hose Division**

Wickliffe, OH  
phone 440 833 2120  
fax 440 833 2230

### **Parflex Division**

Ravenna, OH  
phone 330 296 2871  
fax 330 296 8433

### **Quick Coupling Division**

Minneapolis, MN  
phone 763 544 7781  
fax 763 544 3418

### **Tube Fittings Division**

Columbus, OH  
phone 614 279 7070  
fax 614 279 7685

## **Distribution Service Centers**

### **Buena Park, CA**

phone 714 522 8840  
fax 714 994 1183

### **Conyers, GA**

phone 770 929 0330  
fax 770 929 0230

### **Louisville, KY**

phone 502 937 1322  
fax 502 937 4180

### **Portland, OR**

phone 503 283 1020  
fax 503 283 2201

### **Toledo, OH**

phone 419 878 7000  
fax 419 878 7001  
fax 419 878 7420  
(FCG Kit Operations)

### **Canada**

#### **Grimsby, ONT**

phone 905 945 2274  
fax 905 945 2203  
(Contact Grimsby for other Service Center locations.)

