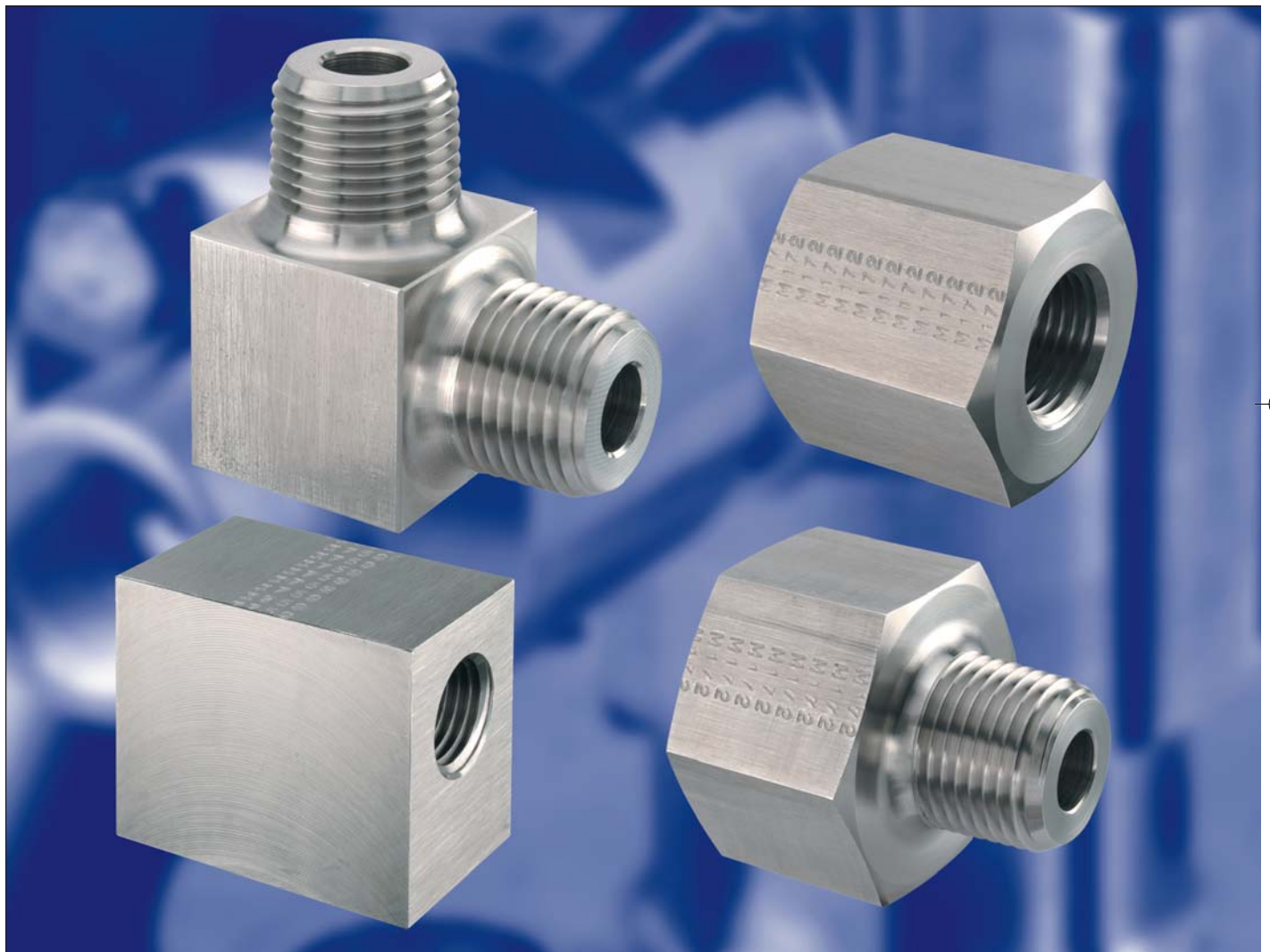




High Pressure Pipe Fittings for 10,000 psi (690 bar) rating

*Catalog 4260-HP
March 2006*



High Pressure 10k Pipe Fittings

Introduction

Parker High Pressure 10k Pipe Fittings are designed as leak-free connections for process, power, instrumentation and general applications. They are manufactured to the highest quality standards and are available in broad ranges of sizes and configurations.

Parker High Pressure 10k Pipe fittings are made at the Instrumentation Products Division of Parker Hannifin where strict adherence to quality control programs are maintained.

Material

Parker Pipe Fittings are standard in stainless steel. Other materials may be available upon request. Fittings are manufactured from applicable ASTM bar stock specifications.

WARNING

Failure, improper selection or improper use of the products and/or systems described herein or related items can cause death, personal injury and property damage.

This document and other information from Parker Hannifin Corporation, its subsidiaries and authorized distributors provide product and/or system options for further investigation by users having technical expertise. It is important that you analyze all aspects of your application and review the information concerning the product or system in the current product catalog. Due to the variety of operating conditions and applications for these products or systems, the user, through its own analysis and testing, is solely responsible for making the final selection of the products and systems and assuring that all performance, safety and warning requirements of the application are met.

The products described herein, including without limitation, product features, specifications, designs, availability and pricing, are subject to change by Parker Hannifin Corporation and its subsidiaries at any time without notice.

Offer of sale

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High Pressure 10k Pipe Fittings

Visual Index Pipe Fittings

MHLN

**Male Hex
Long Nipple**
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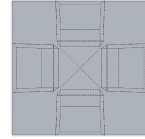
ME

Male Elbow
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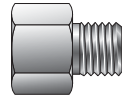
FX

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RA

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MT

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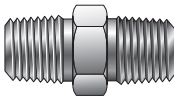
CP

Pipe Cap
page 10



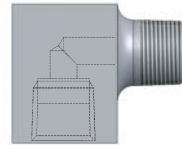
MHN

**Male Hex
Nipple**
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SE

Street Elbow
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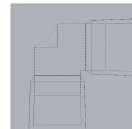
FHC

**Female Hex
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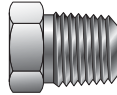
FE

Female Elbow
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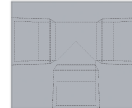
RB

**Reducing
Bushing**
page 7



FT

Female Tee
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Heat Code traceability

Parker Hannifin's Instrumentation Products Division offers Heat Code Traceability (HCT) on High Pressure 10k Pipe fittings.

HCT refers to the fact that a specific part can be traced back to the original mill heat of metal from which it was made. Beginning with the original melt, a package of documents is created which completely describes the metal in physical and chemical terms. The end result is that a number, which is permanently stamped to the part, refers back to the document package.

The HCT number is stamped on the material bar stock prior to manufacturing. The concept is useful because it provides a method for complete material accountability for the manufacturer and end customer.

HCT offers these advantages:

- Raw materials for manufacture must meet code requirements. This can be verified through documentation so that the customer is certain that what is ordered is received.
- HCT provides a record of chemical analysis with the raw material.
- HCT relieves the user of Parker instrumentation pipe fittings of any doubts. It acts as an assurance for today and for tomorrow.

The material used in Parker Hannifin High Pressure 10k Pipe Fittings is AISI 316L Stainless Steel.

The American Society of Mechanical Engineers (ASME) Boiler and Vessel Code, Section III, latest issue, entitled Rules for Construction of Nuclear Power Plant Components, is the principal document covering this type of fitting in the nuclear field. ANSI Standard B.31.1.0, Power Piping, and ANSI Standard B.31.7, Nuclear Power Piping, are also important documents in the field.

In addition to the documentation of chemical and physical properties, great care is taken throughout the manufacture of Parker's tube fittings to ensure that potential stress corrosion will not be a problem in normal usage of the parts. Manufacturing processes avoid exposure of the parts to mercury or halogens, and control of thermal treatment avoids the condition known as continuous grain boundary carbide precipitation.



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High Pressure 10k Pipe Fittings

Features and Technical Data

Parker High Pressure 10k Pipe Fittings are precision machined from bar stock. They are designed to be used for process control connections between pipe sizes.

Features

- Quality engineered for high pressure applications
- Packaged in sealed boxes for cleanliness
- Working pressures calculated in accordance with Power Piping Code ANSI B31.1 and Refinery Piping Code ANSI B31.3.
- All pipe threads are National Pipe Taper (NPT) and exceed the requirements of ANSI B1.20.1.

Pipe Dimensions

Pipe Size	N.P.T. Pipe Thread	R	E Ref.
1/8	1/8 - 27	.38	.157
1/4	1/4 - 18	.56	.216
3/8	3/8 - 18	.56	.303
1/2	1/2 - 14	.75	.390

NPT Threads

The National Pipe Taper (NPT) thread has a thread flank angle of 60° inclusive, and is mainly used in the petrochemical and process industries.

NPT – National Pipe Taper threads for connections where pressure-tight joints are made on the threads utilizing a thread sealant.

System Temperature

Operating temperatures could be a factor resulting in a lower pressure rating being applied to these 10k psi rated High Pressure Pipe Fittings. The 10,000-psi (690 bar) pressure rating is based on ambient temperatures (22°C/72°F). For elevated temperature conditions a derating factor should be applied as listed in the table below.

Simply locate the correct factor and multiply by 10,000 to establish the appropriate elevated temperature working pressure.

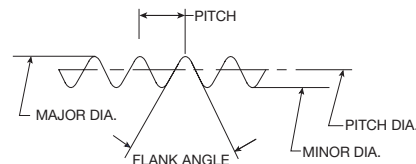
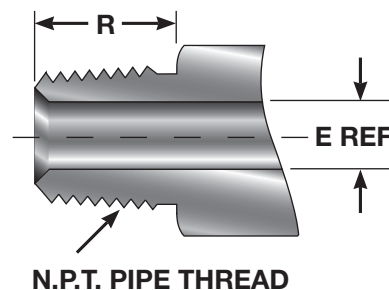
The recommended temperature range for AISI 316L Stainless Steel is -255°C to 649°C (425°F to 1,200°F) but consideration should be given to media for operating temperatures above 427°C (800°F) as 300 series Stainless Steels are susceptible to carbide precipitation, which may lead to intergranular corrosion at elevated temperatures.

- Fittings machined from applicable ASTM bar stock specifications
- Size ranges from 1/8” through 1/2” NPT. (Other sizes may be available upon request.)
- Materials 316L Stainless Steel. (Other materials by special order)
- All exposed threads protected to prevent damage

Nomenclature

Parker Instrument Pipe Fittings part numbers are constructed from symbols that identify the size and style of the fitting and material used.

Example: The part number shown below is for a male hex nipple for 3/8” NPT male pipe and 1/4” NPT male pipe in 316 stainless steel.

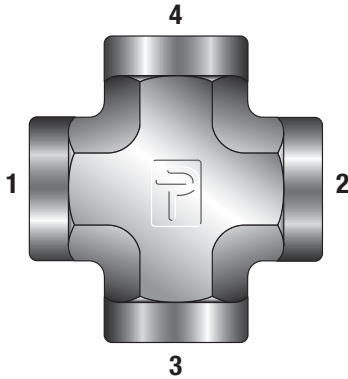
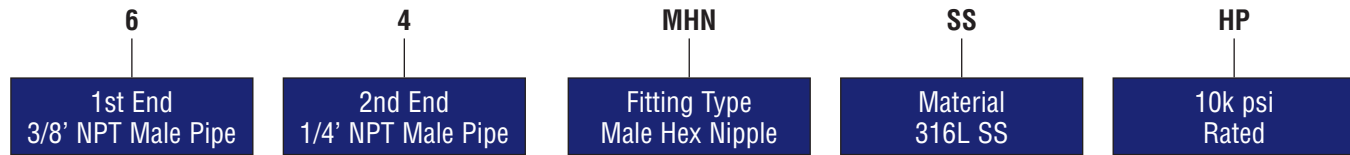


Temperature Derating Factors for 316L Stainless Steel		
Temperature °C	Temperature °F	Derating Factor
150 and below	300 and below	1.00
204	400	0.97
260	500	0.90
316	600	0.85
371	700	0.82
427	800	0.80
486	900	0.78
538	1000	0.77
593	1100	0.62
649	1200	0.37



High Pressure 10k Pipe Fittings

How to Order example



Parker High Pressure 10k Pipe Fittings are ordered by part number as listed in this catalog.

Size: Pipe thread sizes are designated by the number of sixteenths of an inch. (3/8 NPT pipe=6/16=6)

Thread Type: All pipe threads are National Pipe Taper (NPT) unless otherwise designated.

Straights and Elbows: Call out the largest pipe end first followed by the smaller pipe size. See MHN example on page 7.

Tees and Crosses: For tees that are the same pipe sizes on all ends the size designation is as follows: 6-6-6 FT would be a 3/8" NPT Female Tee.

A 1/4" NPT Female Cross in 316L would be a 4 FX-SSHP.

If a reducing tee or cross were specified, each size must be in sequence. First size the largest run (1 to 2) and then the branch (3 to 4).

Example: 6-6-6-4 FX-SSHP

Material: Basic Material Type (SS=316L Stainless Steel)

Special Fittings: If there is any question as to the fitting desired, particularly for special fitting configurations, it is suggested that a customer sketch of what is required be submitted with the request for quote.

Dimensions for reference only, subject to change.

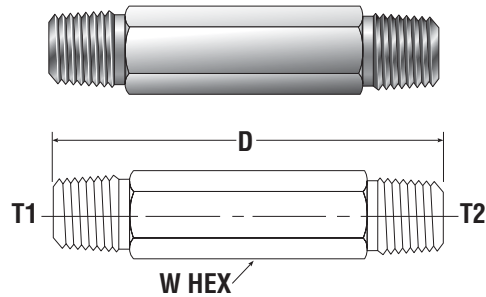


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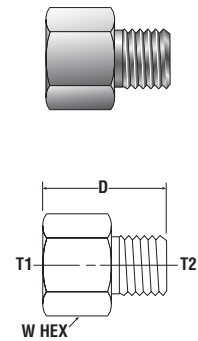
High Pressure 10k Pipe Fittings

Male Hex Long Nipple MHLN



Parker Part No.	NPT THREAD MALE			
	T ₁	T ₂	W Hex	D ins.
4-4 MHLN-3-SSHP	1/4	1/4	5/8	3.00
4-4 MHLN-4-SSHP	1/4	1/4	5/8	4.00
6-6 MHLN-3.0-SSHP	3/8	3/8	3/4	3.00
6-6 MHLN-4.0-SSHP	3/8	3/8	7/8	4.00
8-8 MHLN-2-SSHP	1/2	1/2	7/8	2.00
8-8 MHLN-3	1/2	1/2	7/8	3.00

Adapter RA



Parker Part No.	NPT THREAD MALE			
	Female T ₁	Male T ₂	W Hex	D ins.
4-2 RA-SSHP	1/4	1/8	3/4	1.20
4-4 RA-SSHP	1/4	1/4	3/4	1.39
6-2 RA-SSHP	3/8	1/8	7/8	1.25
6-4 RA-SSHP	3/8	1/4	7/8	1.44
6-6 RA-SSHP	3/8	3/8	7/8	1.44
8-4 RA-SSHP	1/2	1/4	1-1/8	1.69
8-6 RA-SSHP	1/2	3/8	1-1/8	1.69
8-8 RA-SSHP	1/2	1/2	1-1/8	1.88

Dimensions for reference only, subject to change.

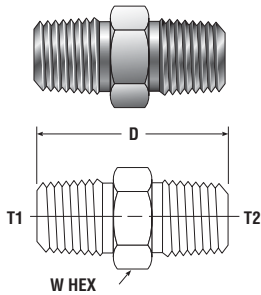


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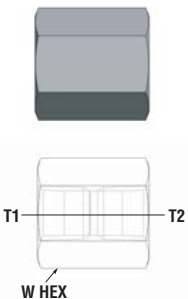
High Pressure 10k Pipe Fittings

Male Hex Nipple MHN



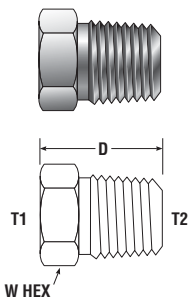
Parker Part No.	NPT THREAD MALE		W Hex	D ins.
	T ₁	T ₂		
2-2 MHN-SSHP	1/8	1/8	7/16	1.06
4-2 MHN-SSHP	1/4	1/8	5/8	1.25
4-4 MHN-SSHP	1/4	1/4	5/8	1.45
6-2 MHN-SSHP	3/8	1/8	3/4	1.27
6-4 MHN-SSHP	3/8	1/4	3/4	1.45
6-6 MHN-SSHP	3/8	3/8	3/4	1.45
8-2 MHN-SSHP	1/2	1/8	7/8	1.52
8-4 MHN-SSHP	1/2	1/4	7/8	1.70
8-6 MHN-SSHP	1/2	3/8	7/8	1.70
8-8 MHN-SSHP	1/2	1/2	7/8	1.89

Female Hex Coupling FHC



Parker Part No.	NPT THREAD FEMALE		W Hex	D ins.
	T ₁	T ₂		
2-2 FHC-SSHP	1/8	1/8	5/8	.75
4-2 FHC-SSHP	1/4	1/8	3/4	.94
4-4 FHC-SSHP	1/4	1/4	3/4	1.13
6-2 FHC-SSHP	3/8	1/8	7/8	1.03
6-4 FHC-SSHP	3/8	1/4	7/8	1.13
6-6 FHC-SSHP	3/8	3/8	7/8	1.13
8-2 FHC-SSHP	1/2	1/8	1-1/8	1.22
8-4 FHC-SSHP	1/2	1/4	1-1/8	1.38
8-6 FHC-SSHP	1/2	3/8	1-1/8	1.50
8-8 FHC-SSHP	1/2	1/2	1-1/8	1.50

Reducing Bushing RB



Parker Part No.	NPT THREAD		W Hex	D ins.
	Female T ₁	Male T ₂		
4-2 RB-SSHP	1/4	1/8	5/8	.86
6-4 RB-SSHP	3/8	1/4	3/4	.86
8-2 RB-SSHP	1/2	1/8	7/8	1.11
8-4 RB-SSHP	1/2	1/4	7/8	1.11
8-6 RB-SSHP	1/2	3/8	7/8	1.11
12-4 RB-SSHP	3/4	1/4	1-1/8	1.17
16-4 RB-SSHP	1	1/4	1-3/8	1.36

Dimensions for reference only, subject to change.

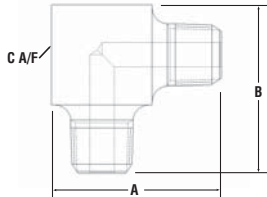


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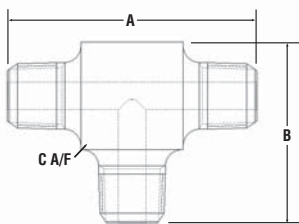
High Pressure 10k Pipe Fittings

Male Elbow ME



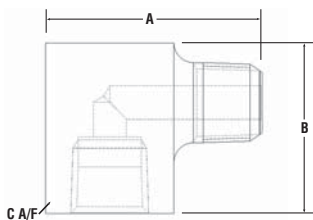
Part No.	Thread Size	A ins.	B ins.	C A/F ins.
2-2ME-SSHP	1/8"	0.69	0.69	0.63
4-4ME-SSHP	1/4"	0.94	0.94	0.75
6-6ME-SSHP	3/8"	0.97	0.97	0.75
8-8ME-SSHP	1/2"	1.31	1.31	1.00

Male Tee MT



Part No.	Thread Size	A ins.	B ins.	C A/F ins.
2-2-2MT-SSHP	1/8"	1.38	0.69	0.63
4-4-4MT-SSHP	1/4"	1.88	0.94	0.75
6-6-6MT-SSHP	3/8"	1.94	0.97	0.75
8-8-8MT-SSHP	1/2"	2.62	1.31	1.00

Street Elbow SE



Part No.	Thread Size	A ins.	B ins.	C A/F ins.
2-2SE-SSHP	1/8" x 1/8"	1.20	0.90	0.75
4-4SE-SSHP	1/4" x 1/4"	1.30	1.00	1.00
6-6SE-SSHP	3/8" x 3/8"	1.40	1.10	1.25
8-8SE-SSHP	1/2" x 1/2"	1.60	1.25	1.50

Dimensions for reference only, subject to change.

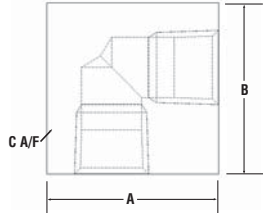
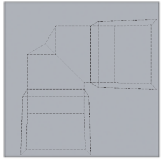


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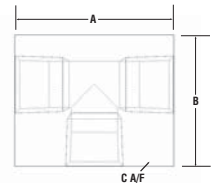
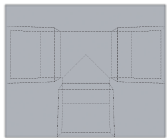
High Pressure 10k Pipe Fittings

Female Elbow FE



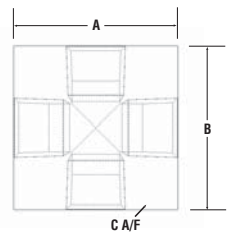
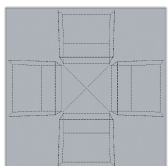
Part No.	Thread Size	A ins.	B ins.	C A/F ins.
2-2FE-SSHP	1/8"	1.12	1.12	0.75
4-4FE-SSHP	1/4"	1.50	1.50	1.00
6-6FE-SSHP	3/8"	1.95	1.95	1.25
8-8FE-SSHP	1/2"	2.00	2.00	1.50

Female Tee FT



Part No.	Thread Size	A ins.	B ins.	C A/F ins.
2-2-2FT-SSHP	1/8"	1.50	1.12	0.75
4-4-4FT-SSHP	1/4"	2.00	1.50	1.00
6-6-6FT-SSHP	3/8"	2.50	1.95	1.25
8-8-8FT-SSHP	1/2"	2.50	2.00	1.50

Female Cross FX



Part No.	Thread Size	A ins.	B ins.	C A/F ins.
2FX-SSHP	1/8"	1.50	1.50	0.75
4FX-SSHP	1/4"	2.00	2.00	1.00
6FX-SSHP	3/8"	2.50	2.50	1.25
8FX-SSHP	1/2"	2.50	2.50	1.50

Dimensions for reference only, subject to change.

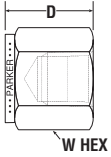


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High Pressure 10k Pipe Fittings

Pipe Cap CP



Parker Part No.	NPT Thread Female	W Hex	D ins.
2 CP-SSHP	1/8	.710	.625
4 CP-SSHP	1/4	.945	.875
6 CP-SSHP	3/8	1.181	1.000
8 CP-SSHP	1/2	1.500	1.350

Dimensions for reference only, subject to change



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1. **Terms and Conditions of Sale:** All descriptions, quotations, proposals, offers, acknowledgments, acceptances and sales of Seller's products are subject to and shall be governed exclusively by the terms and conditions stated herein. Buyer's acceptance of any offer to sell is limited to these terms and conditions. Any terms or conditions in addition to, or inconsistent with those stated herein, proposed by Buyer in any acceptance of an offer by Seller, are hereby objected to. No such additional, different or inconsistent terms and conditions shall become part of the contract between Buyer and Seller unless expressly accepted in writing by Seller. Seller's acceptance of any offer to purchase by Buyer is expressly conditional upon Buyer's assent to all the terms and conditions stated herein, including any terms in addition to, or inconsistent with those contained in Buyer's offer. Acceptance of Seller's products shall in all events constitute such assent.

2. **Payment:** Payment shall be made by Buyer net 30 days from the date of delivery of the items purchased hereunder. Amounts not timely paid shall bear interest at the maximum rate permitted by law for each month or portion thereof that the Buyer is late in making payment. Any claims by Buyer for omissions or shortages in a shipment shall be waived unless Seller receives notice thereof within 30 days after Buyer's receipt of the shipment.

3. **Delivery:** Unless otherwise provided on the face hereof, delivery shall be made F.O.B. Seller's plant. Regardless of the method of delivery, however, risk of loss shall pass to Buyer upon Seller's delivery to a carrier. Any delivery dates shown are approximate only and Seller shall have no liability for any delays in delivery.

4. **Warranty:** Seller warrants that items sold hereunder shall be free from defects in material or workmanship. THIS WARRANTY COMPRISES THE SOLE AND ENTIRE WARRANTY PERTAINING TO ITEMS PROVIDED HEREUNDER. SELLER MAKES NO OTHER WARRANTY, GUARANTEE, OR REPRESENTATION OF ANY KIND WHATSOEVER. ALL OTHER WARRANTIES, INCLUDING BUT NOT LIMITED TO, MERCHANTABILITY AND FITNESS FOR PURPOSE, WHETHER EXPRESS, IMPLIED, OR ARISING BY OPERATION OF LAW, TRADE USAGE, OR COURSE OF DEALING ARE HEREBY DISCLAIMED.

NOTWITHSTANDING THE FOREGOING, THERE ARE NO WARRANTIES WHATSOEVER ON ITEMS BUILT OR ACQUIRED WHOLLY OR PARTIALLY, TO BUYER'S DESIGNS OR SPECIFICATIONS.

5. **Limitation Of Remedy:** SELLER'S LIABILITY ARISING FROM OR IN ANY WAY CONNECTED WITH THE ITEMS SOLD OR THIS CONTRACT SHALL BE LIMITED EXCLUSIVELY TO REPAIR OR REPLACEMENT OF THE ITEMS SOLD, AT SELLER'S SOLE OPTION. IN NO EVENT SHALL SELLER BE LIABLE FOR ANY INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES OF ANY KIND OR NATURE WHATSOEVER, INCLUDING BUT NOT LIMITED TO LOST PROFITS ARISING FROM OR IN ANY WAY CONNECTED WITH THIS AGREEMENT OR ITEMS SOLD HEREUNDER, WHETHER ALLEGED TO ARISE FROM BREACH OF CONTRACT, EXPRESS OR IMPLIED WARRANTY, OR IN TORT, INCLUDING WITHOUT LIMITATION, NEGLIGENCE, FAILURE TO WARN OR STRICT LIABILITY.

6. **Changes, Reschedules and Cancellations:** Buyer may request to modify the designs or specifications for the items sold hereunder as well as the quantities and delivery dates thereof, or may request to cancel all or part of this order, however, no such requested modification or cancellation shall become part of the contract between Buyer and Seller unless accepted by Seller in a written amendment to this Agreement. Acceptance of any such requested modification or cancellation shall be at Seller's discretion, and shall be upon such terms and conditions as Seller may require.

7. **Special Tooling:** A tooling charge may be imposed for any special tooling, including without limitation, dies, fixtures, molds and patterns, acquired to manufacture items sold pursuant to this contract. 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 items sold hereunder, even if such apparatus has been specially converted or adapted for such manufacture and not withstanding any charges paid by Buyer. Unless otherwise agreed, Seller shall have the right to alter, discard or otherwise dispose of any special tooling or other property in its sole discretion at any time.

8. **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, may be considered obsolete and may be destroyed by Seller after two (2) consecutive years have elapsed without Buyer placing an order for the items which are 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. **Taxes:** Unless otherwise indicated on the face hereof, all prices and charges are exclusive of excise, sales, use, property, occupational or like taxes which may be imposed by any taxing authority upon the manufacture, sale or delivery of the items sold hereunder. If any such taxes must be paid by Seller or if Seller is liable for the collection of such tax, the amount thereof shall be in addition to the amounts for the items sold. Buyer agrees to pay all such taxes or to reimburse Seller therefore upon receipt of its invoice. If Buyer claims exemption from any sales, use or other tax imposed by any taxing authority, Buyer shall save Seller harmless from and against any such tax, together with any interest or penalties thereon which may be assessed if the items are held to be taxable.

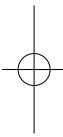
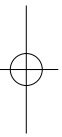
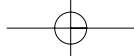
10. **Indemnity For Infringement of Intellectual Property Rights:** Seller shall have no liability for infringement of any patents, trademarks, copyrights, trade dress, trade secrets or similar rights except as provided in this Part 10. Seller will defend and indemnify Buyer against allegations of infringement of U.S. Patents, U.S. Trademarks, copyrights, trade dress and trade secrets (hereinafter '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 an item sold pursuant to this contract 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 an item sold hereunder 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 said item, replace or modify said item so as to make it noninfringing, or offer to accept return of said item and return the purchase price less a reasonable allowance for depreciation. Notwithstanding the foregoing, Seller shall have no liability for claims of infringement based on information provided by Buyer, or directed to items 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 item sold hereunder. The foregoing provisions of this Part 10 shall constitute Seller's sole and exclusive liability and Buyer's sole and exclusive remedy for infringement of Intellectual Property Rights. If a claim is based on information provided by Buyer or if the design for an item delivered hereunder is specified in whole or in part by Buyer, Buyer shall defend and indemnify Seller for all costs, expenses or judgments resulting from any claim that such item infringes any patent, trademark, copyright, trade dress, trade secret or any similar right.

11. **Force Majeure:** Seller does not assume the risk of and shall not be liable for delay or failure to perform any of Seller's obligations by reason of circumstances beyond the reasonable control of Seller (hereinafter 'Events of Force Majeure'). Events of Force Majeure shall include without limitation, accidents, acts of God, strikes or labor disputes, acts, laws, rules or regulations of any government or government agency, fires, floods, delays or failures in delivery of carriers or suppliers, shortages of materials and any other cause beyond Seller's control.

12. **Entire Agreement/Governing Law:** The terms and conditions set forth herein, together with any amendments, modifications and any different terms or conditions expressly accepted by Seller in writing, shall constitute the entire Agreement concerning the items sold, and there are no oral or other representations or agreements which pertain thereto. This Agreement shall be governed in all respects by the law of the State of Ohio. No actions arising out of the sale of the items sold hereunder or this Agreement may be brought by either party more than two (2) years after the cause of action accrues.



Visit us on the web at www.parker.com/ipd



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