



# AX2HP Chemical Injection & Safe Sampling Fittings

Product Brochure & Technical Datasheets

[www.axess.energy](http://www.axess.energy)



# Selecting Your Injection and Sampling Hardware

## The Rate Of Chemical Injection

The rate of chemical injection (gallons/day) is determined by the min/max capacity of the injection pump. Using an atomiser, in a gas system where appropriate, can certainly help with fine volume control by adjusting the injection differential pressure and maintaining a constant application of the chemical. Chemicals that are injected using an open quill are applied in a pulse method with the frequency determined by the stroke rate of the chemical injection pump. In most cases the preferred method is to have a low stroke volume with a high stroke frequency to minimise the time between each pulse injection of chemical.

Chemical injection points should always be located upstream of the equipment and pipework requiring protection. In piping systems where there is a change of material (e.g. duplex at the well heads and carbon steel further down line), the injection point should ideally be located a minimum of 10 x pipe ID upstream of the change in material. The ideal injection location is normally centre line however for higher velocity processes, wake frequency / drag calculations should be considered to determine maximum length whilst maintaining the integrity of the injection device. Axess provide these calculations with every quote and you can generate these yourself by utilizing the Kickstarter part number and RFQ creator on Axess' website.

## Quill Or Nozzle?

The injection head type should be selected based on the process, with quills normally being selected for fluids, and spray nozzles for gas. Nozzle sizes are selected based on the process line pressure, injection line pressure and desired injection rates.

## Quills For Liquid Process Or Multiphase Streams

For chemical applications in liquid process or multiphase streams open quills are most commonly used. Open quills can also be used for the application of corrosion inhibitors in wet gas flowlines or gathering systems provided that the flow regime is sufficient to carry and apply the inhibitor around the full circumference of the line.

## Atomizer Nozzles In Gas Treatment Applications

Atomizers are commonly used for the injection of H<sub>2</sub>S scavenger chemicals in gas treatment applications. In this type of application the use of an atomizer greatly increases the scavenging efficiency due to the fine dispersion of liquid scavenger chemical throughout the gas phase. If H<sub>2</sub>S scavengers are applied using an open quill in dry gas applications the treatment efficiency can be reduced as the liquid scavenger chemical can quickly fall to the bottom of the line resulting in less contact of the H<sub>2</sub>S molecules throughout the gas stream. As a result, the volume of chemical required to achieve the same level of scavenging performance is generally much higher, as you need to overdose, with associated increase in treatment cost required to achieve on-spec gas, commonly <4 ppm H<sub>2</sub>S for sales/export gas pipelines.

## Injecting Corrosion Inhibitor

Many systems and processes can suffer from performance issues related to corrosion in various components such as piping, heat exchangers, pumps, valves, etc. Corrosion can affect the safety and mechanical integrity of a system by degrading materials and components.

For applications of corrosion inhibitor in wet gas streams where the gas velocity is low e.g. a laminar flow regime, the use of an atomizer can improve the efficiency of treatment by maintaining a higher level of dispersion of fine inhibitor droplets throughout the gas phase as it traverses the line allowing contact of the inhibitor to provide a protective film around the full circumference of the line. Spray nozzles coupled with Axess injection fittings and hardware can distribute the inhibitors as evenly as possible along the center line of process streams or vessels.

## Injecting H<sub>2</sub>S Scavenger

Scavengers are liquid chemicals that neutralize and remove small amounts of problematic compounds, typically hydrogen sulfide (H<sub>2</sub>S), from bulk fluid streams. H<sub>2</sub>S is a very hazardous and corrosive gas encountered in the oil and gas industry during the extraction, storage and transportation phases of hydrocarbon processing. H<sub>2</sub>S removal is critically important to prevent damage to expensive infrastructure and to ensure compliance with environmental and safety regulations.

Compared to open-ended injection quills, spray nozzles are designed to maximize efficiency in scavenger injection applications as they atomize and distribute the neutralizing liquid into the process stream which increases the reaction surface area that combines and reacts with H<sub>2</sub>S or other problematic compounds in the pipeline. Axess injection fittings and hardware can distribute the scavengers as evenly as possible along the center line of the process stream to help avoid wall contact or pooling.

# AX2HP & AX2HPH

## Access Fittings

Axess offers a complete range of high pressure access fitting assemblies for installation of intrusive chemical injection and sampling devices.

The product range comprises both the 2" mechanical system as well as the 2" hydraulic system. The 2" retrievable access system is a high pressure access system for the installation of devices into pipework and vessels. The system allows insertion and retrieval of the devices under pressure, enabling monitoring to be maintained continuously without the need to shut down the process.

Axess 2" retrievable access system products are compatible and interchangeable with industry standard products.



## Janus

### Enhanced Sealing Access Fittings

The unique patented design is the first advance in high-pressure access fittings in decades and enhances safety by providing extra layers of protection against process entering the environment, and environment damaging the access fitting.

An external 3" ACME thread enables installation of portable isolation valves used while retrieving devices under line pressure. It is common for double isolation valves to be specified, yet these valves do not provide a double seal at the access fitting. The Janus™ fitting solves this problem with a radial sealing surface for the secondary seals installed in the Janus™ service valve or retro-kit designed to attach to existing service valves.

A third seal is fixed to the access fitting providing external thread and sealing surface protection from the environment. Axess provide the Janus advanced sealing system as standard unless legacy access fittings are specifically requested.



## Horizon

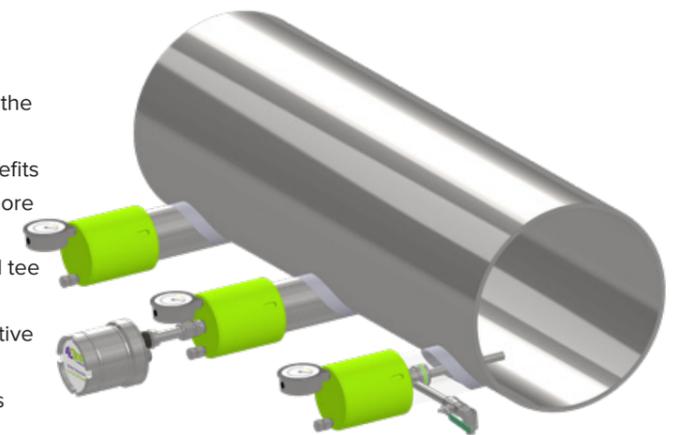
### Side Entry for BOL and TOL Monitoring

This patented design removes the need to position access fittings at the 6 o'clock position for bottom of the line (BOL) monitoring or sampling, or 12 o'clock for top-of-the-line (TOL) monitoring or injection. The benefits are significant and range from safety, integrity, and more accurate data.

Common alternatives to BOL monitoring are to install tee trap systems which provide questionable data as the monitored fluids can be stagnant and not representative of the process flow. Multiple joins and valves add to integrity management inspections and these systems may also freeze in some climates.

Standardizing on Horizon fittings will reduce device lengths and ultimately lead to shorter and lighter retrieval equipment, reducing cost and risk.

Horizon Fittings are an ideal solution for sampling from the bottom of the line water phase and remove issues commonly found with dirt and debris blocking conventional, non-servicable bottom of the line sampling points.



## HP Mechanical

### Access Fitting

Mechanical access fittings have an internal 1¾" UN parallel thread to receive carrier plugs that connect to various devices and seal into place at pressures up to 10,000 PSI (689 Bar) and temperatures up to 204 °C (400 °F). The access fitting and plug body can be supplied with an ACME plug thread to special order.

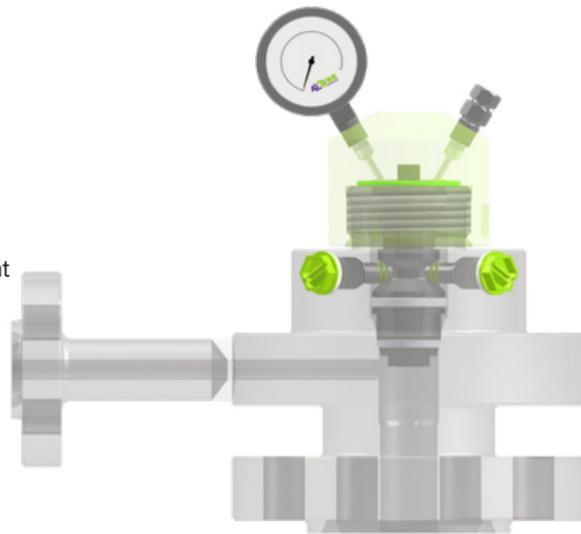
An external 3" ACME thread enables installation of portable isolation valves used while retrieving devices under line pressure and pressure retaining covers providing secondary isolation.



## HP Hydraulic

### Access System

The Axess hydraulic access and retrieval system provides a complete solution for the online safe, reliable installation and retrieval of probes and coupons from high pressure piping, and vessels at pressures up to 10,000 PSI (690 Bar) and temperatures of up to 204 °C (400 °F). Axess 2" hydraulic access products are compatible and interchangeable with industry standard products supplied by other vendors.



#### **Axess 2" access and retrieval system comprises the following components:**

High pressure access fitting

Hollow and solid plugs

Heavy duty pressure retaining covers  
(up to 10,000 PSI/690 Bar)

Retrieval tool and service valve (see separate brochure and data sheet)

- **PRESSURE RATED UP TO 10,000 PSI / 689 BAR**
- **TEMPERATURE TO 204°C / 400°F**
- **RF / RTJ / API FLANGES, WELDED & HUB CONNECTIONS IN MANY MATERIALS**
- **SIDE TEE CONNECTIONS FOR INJECTION OR SAMPLING**
- **NACE MR0175 NORSOK AND PED COMPLIANCE UPON REQUEST**

## Important Factors to Consider

- Chemical density and viscosity
- Process pipe/vessel size, velocity, pressure, temperature, and fluid composition
- Available installation ports and required clearance diameters
- In general process piping applications, a minimum of 3-5 pipe diameters of straight length upstream and 5-10 pipe diameters of straight length downstream are recommended to ensure spray dispersion
- Required materials of construction for corrosive environments
- Ease of maintenance/replacement
- Retrievable system allows for device removal without requiring process shutdown, saving time and money
- Required chemical flow rate
- Pressure differential
- Axess will help you specify the correct nozzle and ensure the devices supplied pass wake frequency / drag force calculations



## Carrier Plugs

**Solid or Hollow (standard 1-3/4 UN & ACME)**

The Solid or Hollow Plug provides the pressure seal in the access fitting and is the carrier for the injection / sampling device. The primary packing is made from PTFE (25% glass filled) as standard but are available in a range of materials including metal seals for high temperature service. The mechanical solid plug has an O-ring that must be selected according to application.

Solid plugs are used with tee type access fittings for chemical injection and sampling. Special hollow plugs are used for the direct injection system in conjunction with non-tee type access fittings.

Axess solid and hollow plugs are available in 316 SS and Duplex material as standard. Plug threads are coated and Axess experts can assist with material selection to reduce or eliminate galling risks.

Special plug designs are available for high velocity applications based on results from wake frequency calculations. Please consult Axess for more information.

## Safety Cover

**Access Fitting**

The Pressure Retaining Cover provides secondary isolation up to 10,000 PSI / 689 Bar (subject to material). The pressure gauge indicates whether the plug seals have leaked and the bleed port allows bleed off prior to removal.

2-hole pressure retaining covers are used for coupon locations and incorporate a pressure indicator and bleed plug for assessment and servicing. All components are available in numerous materials.

The direct injection access fitting system requires a special 3-hole pressure retaining cover.

Lighter duty covers in vinyl or carbon steel are available and are recommended for thread protection during transport and installation only. Axess recommends all HP Access Fittings, once commissioned, are installed with Pressure Retaining Covers. The covers are coated as standard and Axess can also coat to client specifications.



**It is important that correct procedures are followed for the installation and removal of all covers.**

## Side Tees

**Access Fitting**

2" HP access fittings are commonly used for the injection of chemicals to process or for sampling from the process. The ability to maintain or change the injection head under pressure can save time and cost and ensure optimum flow.

The tee can be between 1/4" and 1" diameter and configured to suit the type of service. Options for NPT threaded, socket-weld, butt-weld, and flanged tees are available. Where threaded connections are contemplated, the relevant piping codes should be consulted to ensure these are acceptable.

The addition of a tee adds between 1 and 3" to the height of the standard access fitting (5 1/4") according to the diameter and rating. Where real estate is in short supply, Axess provides Direct Injection fittings that remove the need for a side tee connection.



## Seals

**Access Fitting**

Correct seal selection is vital to ensure safety and longevity of service. Axess has innovated in this area and developed our Janus enhanced sealing system. This adds additional seals to the access fitting cover to increase safety, protect the environment from spillage in case of leaks and to increase access fitting life by protecting the cover threads (please see image on left).



### Typical seal service temperatures\* are detailed below

#### O-Ring

Viton	-45 to +175°C	(-49 to +350°F)
Ethylene Propylene	-50 to +150°C	(-58 to +302°F)
Kalrez	-21 to +250°C	(-5 to +480°F)
Nitrile	-30 to +120°C	(-22 to +248°F)
Viton EDR	-45 to +175°C	(-49 to +350°F)
FF582-90 (AED)	-15 to +275°C	(5 to +525°F)
EOL-101	-33 to +160°C	(-27 to +320°F)
EOL-985	-55 to +150°C	(-67 to +302°F)
Viton 75	-20 to +200°C	(-4 to +392°F)
FR 25/90	-46 to +200°C	(-51 to +392°F)
FFKM MARKEZ Z1400	-15 to +335°C	(+5 to +635°F)

#### Primary Packer

Teflon 25% GF PTFE	-200 to +260°C	(-328 to +500°F)
Dupont Vespel SP-1 Polyimide	-150 to +260°C	(-238 to +500°F)
PEEK	-70 to +200°C	(-94 to +392°F)
Fluoroloy N39 PTFE	-268 to +316°C	(-450 to +600°F)
316L SS	>+287°C	(+550°F)
Nitronic 60	>+287°C	(+550°F)
Hastelloy C276	>+287°C	(+550°F)
Incoloy A825	>+287°C	(+550°F)

\*Temperatures relate to seal material and are not necessarily relevant to their use in access fittings.



# Retrievable Access Fitting Part Number Breakdown

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<b>01 System</b> <ul style="list-style-type: none"> <li>Mechanical</li> <li>Hydraulic</li> </ul>	<b>05 FW/BW Base Radius</b> 2" 02 3" 03 4" 04 6" 06 8"-10" 10 12"-18" 18 20"-36" 35 >36" FL BW FL	<b>06 Tee Size</b> <ul style="list-style-type: none"> <li>NT Non Tee</li> <li>STO 1/4"</li> <li>STH 1/2"</li> <li>STT 3/4"</li> <li>STO 1"</li> </ul>	<b>08 Tee Rating</b> RF Flange 150 300 600 1500 2500 RJ Flange 150 300 600 1500 2500 API RJ 2000 3000 5000 10000	<b>09 Body Material</b> <ul style="list-style-type: none"> <li>A3 316/316L SS</li> <li>A4 A105 CS</li> <li>A5 A350LF2</li> <li>A7 F51 DSS</li> <li>A8 F60 DSS</li> <li>A9 F53 SDSS</li> <li>B1 F55 SDSS</li> <li>B4 Hastelloy C276</li> <li>B5 A625</li> <li>B6 A825</li> <li>C1 304 SS</li> <li>C3 6061-T6 Al</li> <li>C4 A694 F65 CS</li> <li>D1 F44 S/S</li> </ul>	<b>10 System</b> <ul style="list-style-type: none"> <li>Mechanical</li> <li>Hydraulic</li> </ul>	<b>13 Plug Material</b> <ul style="list-style-type: none"> <li>A3 316/316L SS</li> <li>A5 A350LF2 CS</li> <li>A7 F51 DSS</li> <li>A8 F60 DSS</li> <li>A9 F53 SDSS</li> <li>B1 F55 SDSS</li> <li>B2 Nitronic 50</li> <li>B3 Nitronic 60</li> <li>B4 Hastelloy C276</li> <li>B5 A625</li> <li>B6 A825</li> <li>B7 ENIA</li> <li>C1 304 SS</li> <li>C3 6061-T6 Al</li> <li>C4 A694 F65 CS</li> <li>D1 F44 S/S</li> </ul>	<b>14 O-Ring</b> <ul style="list-style-type: none"> <li>1 Viton</li> <li>2 Ethylene Propylene</li> <li>3 Kalrez</li> <li>4 Nitrile</li> <li>5 Viton EDR</li> <li>6 FF 582-90 (AED)</li> <li>7 EOL-101</li> <li>8 EOL-985</li> <li>9 Viton 75</li> <li>10 FR 25/90</li> <li>11 FFKM MARKEZ Z1400</li> </ul>	<b>16 System</b> <ul style="list-style-type: none"> <li>Mechanical</li> <li>Hydraulic</li> </ul>	<b>18 Cover Material</b> <ul style="list-style-type: none"> <li>A3 316/316L SS</li> <li>A5 A350LF2 CS</li> <li>A7 F51 DSS</li> <li>A8 F60 DSS</li> <li>A9 F53 SDSS</li> <li>B1 F55 SDSS</li> <li>B2 Nitronic 50</li> <li>B3 Nitronic 60</li> <li>B4 Hastelloy C276</li> <li>B5 A625</li> <li>B6 A825</li> <li>B7 ENIA</li> <li>C1 304 SS</li> <li>C3 6061-T6 Al</li> <li>C4 A694 F65 CS</li> <li>D1 F44 S/S</li> </ul>	
<b>02 Enhanced Sealing</b> <ul style="list-style-type: none"> <li>JA Janus</li> </ul>	<b>Flange Rating</b> RF Flange 150 300 600 1500 2500 RJ Flange 150 300 600 1500 2500 API RJ 2000 3000 5000 10000	<b>03 Plug Thread</b> <ul style="list-style-type: none"> <li>1 3/4" UNF</li> <li>AT ACME Thread</li> </ul>	<b>04 Fitting Type</b> <ul style="list-style-type: none"> <li>FW Flare-Weld</li> <li>BW Butt-Weld</li> <li>HZ Horizon</li> <li>RF RF Flange</li> <li>RJ RJ Flange</li> <li>API API Flange</li> </ul>	<b>07 Tee Type</b> <ul style="list-style-type: none"> <li>Non Tee</li> <li>BW Butt-weld</li> <li>NPT NPT</li> <li>SW Socket-weld</li> <li>RF Raised Face</li> <li>RJ Ring Joint</li> </ul>	<b>11 Plug Type</b> <ul style="list-style-type: none"> <li>SP Solid</li> <li>DHIP Hollow</li> </ul>	<b>12 Plug Thread</b> <ul style="list-style-type: none"> <li>1 3/4" UNF</li> <li>AT ACME Thread</li> </ul>	<b>15 Primary Packer</b> <ul style="list-style-type: none"> <li>1 Teflon (25% GF PTFE)</li> <li>2 Dupont Vespel SP-1 Polyimide</li> <li>3 PEEK</li> <li>4 Fluoroloy N39 PTFE</li> <li>5 316L SS</li> <li>6 Nitronic 60</li> <li>7 Hastelloy C276</li> <li>8 A825</li> </ul>	<b>17 Cover Type</b> <ul style="list-style-type: none"> <li>2PRCJA 2 Hole - Janus Pressure Retaining</li> <li>DI3PRCJA 3 Hole - Janus Pressure Retaining For Direct Injection</li> <li>2PRC 2 Hole - Pressure Retaining</li> <li>DI3PRC 3 Hole - Pressure Retaining</li> <li>TP0 Thread Protector Without Hole</li> <li>TP1 Thread Protector With Hole For Direct Injection</li> </ul>	<b>19 Cover O-Ring</b> <ul style="list-style-type: none"> <li>1 Viton</li> <li>2 Ethylene Propylene</li> <li>3 Kalrez</li> <li>4 Nitrile</li> <li>5 Viton EDR</li> <li>6 FF 582-90 (AED)</li> <li>7 EOL-101</li> <li>8 EOL-985</li> <li>9 Viton 75</li> <li>10 FR 25/90</li> <li>11 FFKM MARKEZ Z1400</li> </ul>	<b>20 Locking Pins</b> <ul style="list-style-type: none"> <li>LP Hydraulic</li> <li>Mechanical</li> </ul>

AX2HP	H	JA	-	RF	600	-	ST	RF	600	-	A4	/	H	SP	-	A3	-	4	-	2	/	H	2PRCJA	-	A5	-	4	/	LP
Access 2" High Pressure	Hydraulic / Mechanical	Janus Enhanced Sealing	Plug Thread	Fitting Type	Base Radius / Flange Rating	Tee Size	Tee Type	Tee Rating	Body Material	Hydraulic / Mechanical	Plug Type	Plug Thread	Plug Material	O-Ring	Primary Packer	Hydraulic / Mechanical	Cover Type	Cover Material	Cover O-Ring	Locking Pins (Hydraulic Only)									
AX2HP	AT	FW	FL	NT	A3	DHIP	AT	B3	3	3	A3	3																	

# Standard Part Numbering

## Access Fittings

**AX2HP** Axess Corrosion 2" High Pressure Access Fitting, suitable for pressures up to 10,000 PSI (689 Bar) and temperatures up to 204 °C (400 °F).

**01 Hydraulic / Mechanical**

**Hydraulic**



**Mechanical**



**02 Janus Enhanced Sealing**

**Janus Enhanced Cover Sealing System**

The Janus Enhanced Sealing System has multiple O-rings to increase the safety and longevity of the pressure retaining cover, as well as providing a secondary seal on the service valve sealing face to increase user protection.



**Legacy Access Fitting Cover Seal**

The Legacy sealing system only has one O-ring for the cover and only one O-ring face for sealing during the retrieval process.



**03 Plug Thread**

**1 3/4" UN**



**ACME (Mechanical Only)**



**Hydraulic**



**04 Fitting Type**

**Fitting Type**

- FW** Flare-Weld
- BW** Butt-weld
- HZ** Horizon
- RF** RF Flange
- RJ** RJ Flange
- API** API



Flare-weld, Butt-weld & Horizon fittings weld directly to the pipe. Horizon is an Axess Innovation, allowing true bottom of the line retrievable monitoring without requiring under pipe access.

Flange fittings connect to the pipe via flanged branches. Raised Face and Ring Joint are available to suit ANSI and API flanges.

**05 Base Radius / Flange Rating**

**Base Radius**

FW & HZ access fittings for use with pipes up to 36" require the base of the fitting to be radiused to suit the pipe outside diameter. Axess can add this radius at the factory to speed up installation.



- 02** For use with pipes 2" NB
- 03** For use with pipes 3" NB
- 04** For use with pipes 4" NB
- 06** For use with pipes 6" NB
- 10** For use with pipes 8"-10" NB
- 18** For use with pipes 12"-18" NB
- 36** For use with pipes 20"-36" NB
- FL** For use with pipes >36" NB
- PL** For BW fittings

**Flange Rating**

RF & RJ Flanged access fittings can be offered in various flange ratings to suit the specific application. Please contact the factory for any special requirements not listed below:

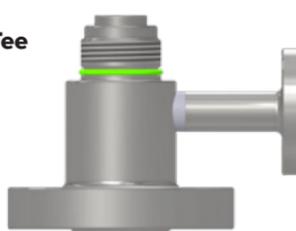
<b>150</b>	150# Flange Rating	ANSI RF & RJ
<b>300</b>	300# Flange Rating	
<b>600</b>	600# Flange Rating	
<b>1500</b>	900/1500# Flange Rating	
<b>2500</b>	2500# Flange Rating	
<b>2000</b>	2000# Flange Rating	API RJ
<b>3000</b>	3000# Flange Rating	
<b>5000</b>	5000# Flange Rating	
<b>10000</b>	10000# Flange Rating	

**06 Tee Size**

**Fitting Without Tee**

**NT** Non-tee

**Fitting With Tee**



- STO** 1/4" Tee Size
- STH** 1/2" Tee Size
- STT** 3/4" Tee Size
- STO** 1" Tee Size

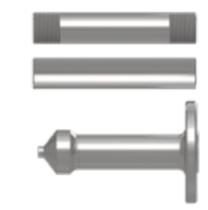
**07 Tee Type**

**Leave Blank For**

**-** Non-tee

**Access Fitting Tee Type**

- NPT** NPT
- SW** Socket-weld
- BW** Butt-weld
- RF** Raised Face Flange
- RJ** Ring Joint Flange
- API** API RJ Flange



**08 Tee Rating**

**Leave Blank For**

- Non-tee
- BW** Butt-weld
- NPT** NPT
- SW** Socket-weld

**Access Fitting Tee Rating**

<b>150</b>	150# Flange Rating	ANSI RF & RJ
<b>300</b>	300# Flange Rating	
<b>600</b>	600# Flange Rating	
<b>1500</b>	900/1500# Flange Rating	
<b>2500</b>	2500# Flange Rating	
<b>2000</b>	2000# Flange Rating	API RJ
<b>3000</b>	3000# Flange Rating	
<b>5000</b>	5000# Flange Rating	
<b>10000</b>	10000# Flange Rating	

**09 Body Material**

**Access Fitting Body Material**

<b>A3</b> 316/316L SS	<b>A9</b> F53 SDSS	<b>C1</b> 304 SS
<b>A4</b> A105 CS	<b>B1</b> F55 SDSS	<b>C3</b> 6061-T6 Al
<b>A5</b> A350LF2	<b>B4</b> Hastelloy C276	<b>C4</b> A694 F65 CS
<b>A7</b> F51 DSS	<b>B5</b> A625	
<b>A8</b> F60 DSS	<b>B6</b> A825	

Other materials are available, please contact us with your requirements.

10 **H Hydraulic** OR **M Mechanical**

11 **SP Solid Plug** **HP Hollow Plug**

12 **Plug Thread**

1 3/4" UN ACME (Mechanical Only) Hydraulic

13 **Plug Material**

<b>A3</b> 316/316L SS	<b>B1</b> F55 SDSS	<b>B6</b> A825
<b>A5</b> A350LF2 CS	<b>B2</b> Nitronic 50	<b>C1</b> 304 SS
<b>A7</b> F51 DSS	<b>B3</b> Nitronic 60	<b>C3</b> 6061-T6 Al
<b>A8</b> F60 DSS	<b>B4</b> Hastelloy C276	<b>C4</b> A694 F65 CS
<b>A9</b> F53 SDSS	<b>B5</b> A625	

Other materials are available, please contact us with your requirements.

14 **O-Ring**

**Mechanical Solid Plug O-ring Material**

<b>1</b> Viton
<b>2</b> Ethylene Propylene
<b>3</b> Kalrez
<b>4</b> Nitrile
<b>5</b> Viton EDR
<b>6</b> FF582-90 (AED)
<b>7</b> EOL-101
<b>8</b> EOL-985
<b>9</b> Viton 75
<b>10</b> FR 25/90
<b>11</b> FFKM MARKEZ Z1400

15 **Primary Packer**

**Plug Primary Packer Seal Material**

<b>1</b> Teflon (25% GF PTFE)
<b>2</b> Dupont Vespel SP-1 Polyimide
<b>3</b> PEEK
<b>4</b> Fluoroloy N39 PTFE
<b>5</b> 316L SS
<b>6</b> Nitronic 60
<b>7</b> Hastelloy C276
<b>8</b> A825

Hollow Plug's Probe seal is GF PTFE as standard

16 **H Hydraulic** OR **M Mechanical**

17 **Cover Type**

**Thread Protector**

**TP0** Thread Protector

**DITP1** Thread protector cover with centre hole for direct injection adapter

**Pressure Retaining**

**2PRC** Pressure retaining cover with 2x 1/4" NPT holes for bleed port & pressure gauge

**D13PRC** Pressure retaining cover with 2x 1/4" NPT holes for bleed port & pressure gauge plus central 3/4" NPT hole for direct injection adapter

**Janus Enhanced**

**2PRCJA** 2PRC with Janus Enhanced Sealing System

**D13PRCJA** 3PRC with Janus Enhanced Sealing System for direct injection adapter

18 **Cover Material**

<b>A3</b> 316/316L SS	<b>B1</b> F55 SDSS	<b>B6</b> A825
<b>A5</b> A350LF2 CS	<b>B2</b> Nitronic 50	<b>B7</b> EN1A
<b>A7</b> F51 DSS	<b>B3</b> Nitronic 60	<b>C1</b> 304 SS
<b>A8</b> F60 DSS	<b>B4</b> Hastelloy C276	<b>C3</b> 6061-T6 Al
<b>A9</b> F53 SDSS	<b>B5</b> A625	<b>C4</b> A694 F65 CS

Other materials are available, please contact us with your requirements.

19 **Cover O-Ring**

**Pressure Retaining Cover O-Ring Material**

<b>1</b> Viton	<b>7</b> EOL-101
<b>2</b> Ethylene Propylene	<b>8</b> EOL-985
<b>3</b> Kalrez	<b>9</b> Viton 75
<b>4</b> Nitrile	<b>10</b> FR 25/90
<b>5</b> Viton EDR	<b>11</b> FFKM MARKEZ Z1400
<b>6</b> FF582-90 (AED)	

20 **LP Hydraulic** OR **M Mechanical**

## Additional Requirements

### Access Fittings

These codes can be listed after your access fitting part number to capture customer specific requirements.

**Painting / Coating**

**ZP** Carbon steel access fitting bodies & covers are Zinc Phosphate coated as standard

**NC** No Coating (CRA access fitting bodies & covers are not coated as standard)

**SC** Special Coating (please provide the coating specification, system & top coat colour)

**Inspection & Testing\***

**HT** Hydro test (Pressure test) of access fitting body

**PMI** Positive Material Identification of CRA plug body plus cover & fitting body if applicable

**MPI** Magnetic Particle Inspection of carbon steel access fitting body

**LPI** Liquid / Dye Penetrant Inspection of CRA access fitting body

**UT** Ultrasonic Test of access fitting body, usually on welded tee only

**RT** Radiographic (X-Ray) Test of access fitting body, on welded tee only

**TPI** Provision of third party inspector to witness stages & perform final inspection

\*Please advise and provide any specific test procedures and inspection scope to be followed.

**Tag Plates**

**T** Standard tag plate fitted to access fitting body

**ZT** Supply access fitting body without tag plate

**LT** Supply tag plates loose for customer to attach

**BT** Tag plate supplied without text

# Chemical Injection & Sampling

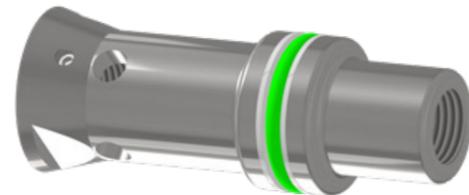
## System Internal Components

The retrievable chemical injection access fitting requires an access fitting body, plug assembly and cover. In addition injection / sampling nut and the injection / sampling device are required. The following pages are a guide to the nut and device options and generating their part numbers. There are numerous options, the variations detailed in this document are the most commonly found. Please contact Axess if your required product is not listed.

**This page is the guide to the nut options and generating the nut part number.**

## Injection / Sampling Nut

The nut acts as the fluid transfer device, in the case of injection this is from the fitting to the injection device, for sampling the flow direction is reversed. An injection nut can incorporate a check valve to prevent process fluid from entering the injection system when injection is not taking place for example during pulsed injection. There would be no check valve in sampling applications as this would prevent sampling from being possible.



The nut is made up of a metallic body, which is sized to suit the access fitting and the NB of the injection / sampling device. The nut has an O-ring plus 2 back-up rings. The nut is specified using the below part number generating process.

IN	3.75	CV	-	Q	-	A3	-	1	-	1
Injection / Sampling Nut	Nut Length	Integral Check Valve	-	FNPT Thread Size	-	Nut Body Material	-	O-ring Material	-	Back-up Ring Material
IN	5.5	-	-	H	-	B5	-	3	-	1

Injection nut, 3.75" long, integral check valve. 1/4" FNPT thread. 316/316L S/S body, Viton O-ring, PTFE back-up rings

Examples

Injection nut, 5.5" long, 1/2" FNPT thread. A625 body, Kalrez O-ring, PTFE back-up rings

### Nut Length

#### Mechanical Fitting Height

5.25"  
6.25"  
7.25"  
8.25"

#### Nut Length

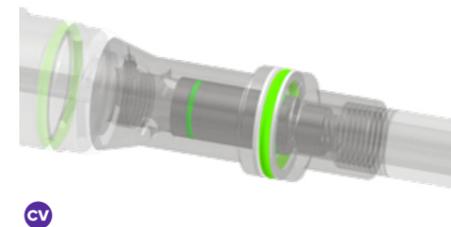
1.75"  
2.75"  
3.75"  
5.5"

#### Hydraulic Fitting Height

6.5"  
7.5"  
8.5"  
9.5"

### Integral Check Valve

#### CV for integral check valve



CV

#### Leave blank for without check valve



-

### FNPT Thread Size

- Q 1/4"
- H 1/2"
- T 3/4"



### Nut Body Material

- 316/316L SS (standard)
- A7 F51 DSS
- A8 F60 DSS
- A9 F53 SDSS
- B1 F55 SDSS
- B4 Hastelloy C276
- B5 A625
- B6 A825

Other materials are available, please contact us with your requirements.

### Nut O-ring Material

- 1 Viton (Standard)
- 2 Ethylene Propylene
- 3 Kalrez
- 4 Nitrile
- 5 Viton EDR
- 6 FF582-90 (AED)
- 7 EOL-101
- 8 EOL-985
- 9 Viton 75
- 10 FR 25/90
- 11 FFKM MARKEZ Z1400



### 1

#### Nut Back-up Ring Material

Teflon [25% GF PTFE] (standard)

# Chemical Injection & Sampling

## System Internal Components

The retrievable chemical injection access fitting requires an access fitting body, plug assembly and cover. In addition injection / sampling nut and the injection / sampling device are required. The following pages are a guide to the nut and device options and generating their part numbers. There are numerous options, the variations detailed in this document are the most commonly found. Please contact Axess if your required product is not listed.

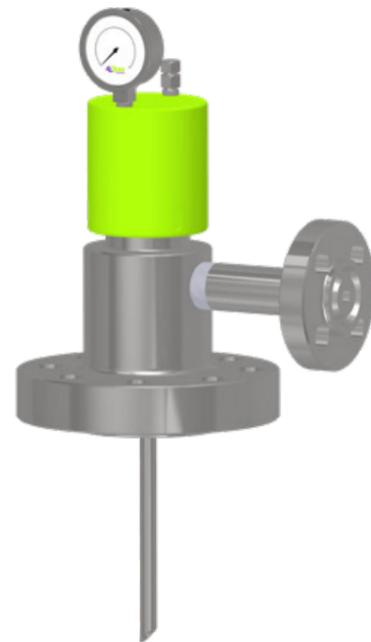
**This page is the guide to the device options and generating the device part number.**

## Injection / Sampling Device

The simplest injection device is a quill, with the tip cut at an angle incorporating a slot to aid with the dispersal of the injected fluid into the process flow.

This is suitable for liquid applications however gas service should incorporate an atomizing device to ensure even dispersal of the injected fluid.

The standard sampling device is a tube cut at 90°. The device is specified using the below part number generating process. Note that standard options, for example 316/316L S/S material, can be left blank.



IT	Q	Q	NS	60	-	-	-	10.25
IT = Injection Tube	Type	Injection Tube NB & MNPT Thread Size	Quill Slot	Quill Angle	-	Injection Head FNPT Thread Size	Tube Schedule	Material
IT	X	H			-	F	SCHXXS	A7
								Order Length

Sampling tube, cut at 60° with no slot, tube is 1/4" Sch.80 with 10.25" order length. 316/316L S/S material.

Examples

Injection tube with 90° head for 1/8" FNPT atomizer, tube is 1/2" Sch.XXS with 12.75" order length, S31803 DSS material.

Type	<b>Type</b>			
	O	Open		Tube cut at 90°, typically used for sampling
	Q	Quill	Quill, with tip cut at angle	
	T	MNPT threaded both ends	Threaded at both ends	
	X	90° Perpendicular Flow Nozzle	90° head with female thread for atomizer injection in line with process flow	
	P	Parallel	Atomizer nozzle fitted to tip of device to allow injection down into process flow.	
Tube & MNPT Thread Size	<b>MNPT Thread Size</b>	<b>Tube Size / Flow Rate</b>	<p>Not all pipe sizes are available for all materials</p>	
	Q	1/4"		20 liters per minute    5.28 gallons per minute
	H	1/2"		65 liters per minute    17.17 gallons per minute
	T	3/4"		115 liters per minute    30.38 gallons per minute
Quill Slot	<b>Leave Blank for with slot (standard)</b>	<b>NS = no slot</b>		
Quill Angle	<b>Leave Blank for 45° (standard)</b>	<b>60 for 60°</b>		
Injection Head Female Thread Size		<b>NOTE:</b> Not all pipe sizes are available with 90° injection heads		
Schedule	Sch.80 (standard)	Leave blank	<p><b>NOTE:</b> Not all Sch. Sizes are available for all pipe sizes and materials</p>	
	Sch.160	SCH160		
	Sch.XXS	SCHXXS		
Material		<b>NOTE:</b> Many other options are available		
Order Length	The order length for the injection / sampling device is dependent upon numerous factors, including but not limited to:			
	<ul style="list-style-type: none"> <li>Pipe dimensions</li> <li>Required injection / sampling location</li> <li>Mounting flange height (if applicable)</li> <li>Access fitting type</li> <li>Access fitting dimensions (height)</li> <li>Injection / sampling nut length</li> <li>Wake frequency and / or stress calculations as applicable.</li> </ul>			
When ordering please use the full length with decimal point. Manufacturing length increment is 0.25", however custom lengths can be accommodated. Why not use Axess' Kickstarter program to take the stress out of the length calculations, available via our website.				

# Injection Atomizer Device

Atomizers are recommended for service in gas process applications. The injected fluid is broken into a fine mist to ensure maximum and even distribution into the process flow. This requires careful product selection taking into account the required flow rate and pressure differential between the pressure of the injected fluid and the process pressure.

The characteristics of some of the nozzles are listed here, with flow rate and pressure differentials listed in US gallons per hour against PSI. Alternatively please log in to our Kickstarter program via our website to utilize the automated atomizer nozzle selection.



## Injection Atomizers For Use With 90° Perpendicular Flow Nozzle

Flow rate in US Gallons Per Hour at Pressure Differential in PSI

Product	Nozzle P/No.	44	58	73	87
X	AX-3/16"-0.3-CC	0.30	0.36	0.41	0.48
X	AX-3/16"-0.4-CC	0.40	0.48	0.55	0.63
X	AX-3/16"-0.6-CC	0.60	0.71	0.84	0.95



Flow Rate in US Gallons Per Hour at Pressure Differential in PSI

Product	Nozzle P/No.	3	4	7	10	15	22	29	44	73	145	290	435	725	1015
X-E	NZPJEPT-6								0.49	0.68	0.97	1.19	1.54	1.81	
X-E	NZPJEPT-8								0.92	1.30	1.84	2.25	2.90	3.44	
X-E	NZPJEPT-10								1.06	1.38	1.95	2.74	3.36	4.34	5.14
X-E	NZPJEPT-12								1.44	1.85	2.63	3.71	4.55	5.88	6.96
X-E	NZPJEPT-15							1.89	2.31	3.00	4.23	5.98	7.32	9.45	11.17
X-E	NZPJEPT-20							3.42	4.18	5.40	7.66	10.83	13.25	17.12	20.29
X-E	NZPJEPT-24							5.10	6.26	8.08	11.43	16.17	19.81	25.52	30.27
X-E	NZPJEPT-28							6.64	8.13	10.49	14.85	20.92	25.68	33.13	39.31
X-E	NZPJEPT-32							9.19	11.25	14.53	20.56	29.01	35.66	45.97	54.37
X-E	NZPJEPT-40							14.30	17.59	22.67	32.02	45.17	55.32	71.48	84.64
X-E	1/8S1	3.23	3.96	5.07	6.02	7.29	8.88	10.14	12.52	16.17	21.71				
X-E	1/8S1.5	4.85	5.86	7.61	9.03	10.78	13.31	15.37	18.70	24.25	32.49				
X-E	1/8S2	6.50	7.93	10.14	12.05	14.42	17.75	20.45	25.04	32.33	43.27				
X-E	1/8S3	9.67	11.89	15.37	18.07	21.71	26.47	30.59	37.57	48.50	64.99				
X-E	1/8S3.5	11.25	13.79	17.91	21.08	25.36	30.91	35.82	43.75	57.06	76.08				
X-E	1/8S5	16.17	19.81	25.52	30.27	36.14	44.22	50.72	61.82	80.84	107.78				
X-E	1/8S6	19.34	23.78	30.59	36.30	43.27	52.31	61.82	74.50	96.69	129.97				



Flow Rate in US Gallons Per Hour at Pressure Differential in PSI

Product	Nozzle P/No.	3	4	7	10	15	22	29	44	73	145	290	435	725	1015
XQ	NZPQNPT-6								0.49	0.68	0.97	1.19	1.54	1.81	
XQ	NZPQNPT-8								0.92	1.30	1.84	2.25	2.90	3.44	
XQ	NZPQNPT-10								1.06	1.38	1.95	2.74	3.36	4.34	5.14
XQ	NZPQNPT-12								1.44	1.85	2.63	3.71	4.55	5.88	6.96
XQ	NZPQNPT-15							1.89	2.31	3.00	4.23	5.98	7.32	9.45	11.17
XQ	NZPQNPT-20							3.42	4.18	5.40	7.66	10.83	13.25	17.12	20.29
XQ	NZPQNPT-24							5.10	6.26	8.08	11.43	16.17	19.81	25.52	30.27
XQ	NZPQNPT-28							6.64	8.13	10.49	14.85	20.92	25.68	33.13	39.31
XQ	NZPQNPT-32							9.19	11.25	14.53	20.56	29.01	35.66	45.97	54.37
XQ	NZPQNPT-40							14.30	17.59	22.67	32.02	45.17	55.32	71.48	84.64
XQ	1/4S5	16.17	19.81	25.52	30.27	36.14	44.22	50.72	61.82	80.84	107.78				
XQ	1/4S6.5	20.92	25.68	33.13	39.31	46.92	57.06	66.57	80.84	104.61	141.07				
XQ	1/4S7.5	24.25	29.64	38.36	45.33	53.89	66.57	76.08	93.52	120.46	163.26				
XQ	1/4S8.5	27.42	33.60	43.43	50.72	61.82	74.50	87.18	106.20	137.90	183.86				
XQ	1/4S10	32.33	39.63	50.72	60.23	72.91	88.76	101.44	125.22	161.67	217.15				
XQ	1/4S14	45.17	55.48	71.33	84.01	101.44	123.63	142.65	175.94	226.66	302.74				



# Injection Atomizers

## For Use With Parallel Flow Nozzle

Flow Rate in US Gallons Per Hour at Pressure Differential in PSI

Product	Nozzle P/No.	3	4	7	10	15	22	29	44	73	145	290	435	725	1015
PH	1/4NN-SS0.6										1.30	1.60	2.10	2.50	3.00
PH	1/4NN-SS1								1.00	1.20	2.20	2.70	3.50	4.20	5.00
PH	1/4NN-SS1.5							1.30	1.50	1.80	3.40	4.10	5.30	6.30	7.50
PH	1/4NN-SS2							1.70	2.00	2.40	4.50	5.50	7.10	8.40	10.00
PH	1/4NN-SS3							2.60	3.00	3.70	6.70	8.20	10.60	12.50	15.00
PH	1/4NN-SS4							3.50	4.00	4.90	8.90	11.00	14.10	16.70	20.00
PH	1/4NN-SS6							5.20	6.00	7.30	13.40	16.40	21.00	25.00	30.00
PH	1/4NN-SS7							6.90	8.00	9.80	17.90	22.00	28.00	33.00	40.00
PH	1/4NN-SS10							8.70	10.00	12.20	22.00	27.00	35.00	42.00	50.00
PH	1/4NN-SS12							10.40	12.00	14.70	27.00	33.00	42.00	50.00	60.00
PH	1/4NN-SS14							12.10	14.00	17.10	31.00	38.00	49.00	59.00	70.00
PH	1/4NN-SS16							13.90	16.00	19.60	36.00	44.00	57.00	67.00	80.00
PH	1/4NN-SS18							15.60	18.00	22.00	40.00	49.00	64.00	75.00	90.00
PH	1/4NN-SS22							19.10	22.00	27.00	49.00	60.00	78.00	92.00	110.00
PH	1/4NN-SS26							23.00	26.00	32.00	58.00	71.00	92.00	109.00	130.00
PH	NZPJQNPT-6									0.49	0.68	0.97	1.19	1.54	1.81
PH	NZPJQNPT-8									0.92	1.30	1.84	2.25	2.90	3.44
PH	NZPJQNPT-10								1.06	1.38	1.95	2.74	3.36	4.34	5.14
PH	NZPJQNPT-12								1.44	1.85	2.63	3.71	4.55	5.88	6.96
PH	NZPJQNPT-15							1.89	2.31	3.00	4.23	5.98	7.32	9.45	11.17
PH	NZPJQNPT-20							3.42	4.18	5.40	7.66	10.83	13.25	17.12	20.29
PH	NZPJQNPT-24							5.10	6.26	8.08	11.43	16.17	19.81	25.52	30.27
PH	NZPJQNPT-28							6.64	8.13	10.49	14.85	20.92	25.68	33.13	39.31
PH	NZPJQNPT-32							9.19	11.25	14.53	20.56	29.01	35.66	45.97	54.37
PH	NZPJQNPT-40							14.30	17.59	22.67	32.02	45.17	55.32	71.48	84.64
PH	1/4S5	16.17	19.81	25.52	30.27	36.14	44.22	50.72	61.82	80.84	107.78				
PH	1/4S6.5	20.92	25.68	33.13	39.31	46.92	57.06	66.57	80.84	104.61	141.07				
PH	1/4S7.5	24.25	29.64	38.36	45.33	53.89	66.57	76.08	93.52	120.46	163.26				
PH	1/4S8.5	27.42	33.60	43.43	50.72	61.82	74.50	87.18	106.20	137.90	183.86				
PH	1/4S10	32.33	39.63	50.72	60.23	72.91	88.76	101.44	125.22	161.67	217.15				
PH	1/4S14	45.17	55.48	71.33	84.01	101.44	123.63	142.65	175.94	226.66	302.74				



**NOTE:** Parallel Nozzle requires hex coupler / thread adapter to convert the injection tube to 1/4" FNPT. Part numbering as below:

200170 - **O** -

Hex FNPT to 1/4" FNPT thread adapter

200170 - **H** -

**O**

Injection Tube Size

**H**

**A7**

Material

Hex FNPT x FNPT thread coupler, 1/4" FNPT x 1/4" FNPT. 316/316L S/S material.

Hex FNPT x FNPT thread adapter, 1/2" FNPT to 1/4" FNPT. S31803 DSS material.

**Material Codes**

- 316/316L SS (standard)
- A7 F51 DSS
- A8 F60 DSS
- A9 F53 SDSS
- B1 F55 SDSS
- B4 Hastelloy C276
- B5 A625
- B6 A825

**NOTE**  
Many other material options are available

## Direct Injection System

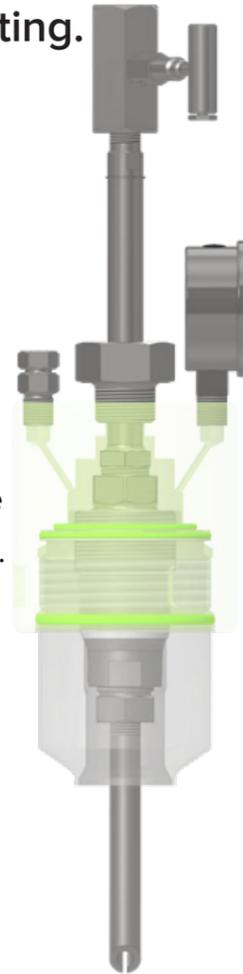


The Direct Injection (DI) tee-less access fitting system allows injection through a non-tee access fitting.

This suits applications where there is insufficient room for a side tee or there is a pre-installed tee-less access fitting which customer wishes to appropriate for injection service.

Access fitting components for the DI system are shown in the access fitting ordering system. The plug is a special type incorporating two check valves (please see image on left, shown fitted with direct injection nut).

The other required components are the special injection nut which connects the injection device to a hollow plug and the injection adaptor which allows the injection feed to connect to the hollow plug.

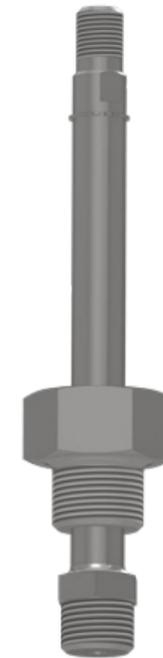


## Direct Injection Nut (DIN)



FNPT Thread Size	Material	Back-Up Ring
Q 1/4"	- 316/316L SS (standard)	GF Teflon
H 1/2"	A7 F51 DSS	
T 3/4"	A8 F60 DSS	
	A9 F53 SDSS	
	B1 F55 SDSS	
	B4 Hastelloy C276	
	B5 A625	
	B6 A825	
	C1 304 SS	

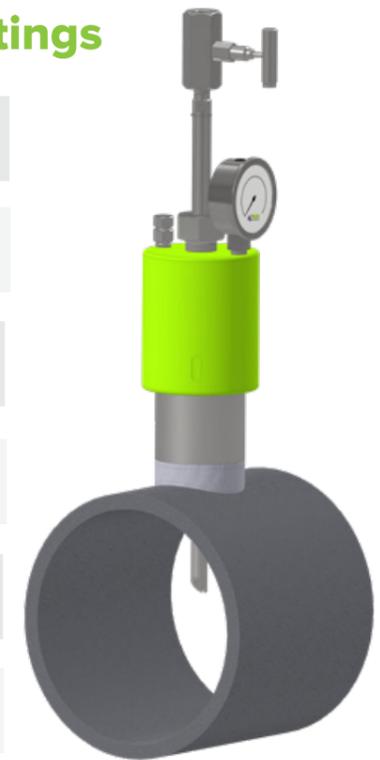
## Direct Injection Adapter (DIADPT)



Material	O-Ring	Back-Up Ring
- 316/316L SS (standard)	1 Viton Standard	GF Teflon
A7 F51 DSS	2 Ethylene Propylene	
A8 F60 DSS	3 Kalrez	
A9 F53 SDSS	4 Nitrile	
B1 F55 SDSS	5 Viton EDR	
B4 Hastelloy C276	6 FF582-90 (AED)	
B5 A625	7 EOL-101	
B6 A825	8 EOL-985	
C1 304 SS	9 Viton 75	
	10 FR 25/90	
	11 FFKM MARKEZ Z1400	

## Benefits Of Direct Injection Fittings

- Reuse an existing non-tee access fitting
- Access fitting can be converted without system shutdown
- Integral check-valves to ensure safe operation
- Compact vertical design
- Compatible with industry standard mechanical and hydraulic access fittings and retrieval equipment
- Retrievable system allows for device removal without requiring process shutdown, saving time and money



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