2005 WJM 2025

WATERJET SOLUTIONS DE MÉXICO

20 ANIVERSARIO

Flow

SHAPE TECHNOLOGIES GROUP®

Cutting Heads

PASER® 3

main menu

section menu

009940-1 **PASER 3 cutting head assembly**

Includes mixing chamber, retainer collet, and nut.

★009940-2 **PASER 3 mixing chamber assembly**

The mixing chamber has one inlet for the abrasive and one connection available for VaccumAssist. Inlet and connection are each equipped with an insert of hardened metal.

009941-1 **Retainer collet**

009939-1 **Nut, abrasive nozzle clamp**

009957-1 **Dehazer/pierce shield assembly**

A-11078 **Carbide pin**

For use with mixing chamber 009940-1 and 009940-2.

The technology

The patented PASER 3 cutting head system provides you with special advantages in your application: The cutting head itself consists of just five components. When the orifice is changed, it automatically adjusts to center. This is the only way to ensure that it can be changed or realigned quickly and easily.

more

Cutting Heads
PASER® 3

A-11080 **Cap**

For use with mixing chamber 009940-1 and 009940-2.
The cap closes the connection for Vacuum Assist when it is not in use.

002895-1 **High-pressure collar, valve inlet**

★010008-1 **Performance monitor gauge**

A-00256-12 **Hose, 3/4 in. x 1B**

For transfering garnet from the abrasive bulk transfer hopper to the PASER® 3 mini-hopper.

A-6069 **Tubing, 1/4 in. x 3/8 in.**

For transfering garnet from the PASER® 3 mini-hopper to the cutting head.

The technology

The patented PASER 3 cutting head system provides you with special advantages in your application: The cutting head itself consists of just five components. When the orifice is changed, it automatically adjusts to center. This is the only way to ensure that it can be changed or realigned quickly and easily.

more

Cutting Heads

PASER® 3–WMC

main menu

section menu

★009940-2 **Mixing chamber assembly**

The mixing chamber has one inlet for the abrasive and one connection available for VaccumAssist. Inlet and connection are each equipped with an insert of hardened metal.

★710349-1 **Nozzle clamp**

009941-1 **Retainer collet**

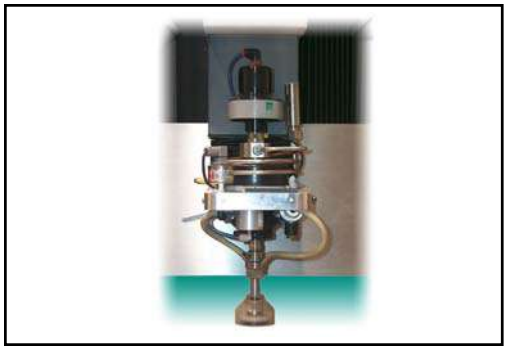
★710348-1 **Insert**

Of hardened metal for height sensor.

A-0275-018 **O-ring**

710351-1 **Spray shield**

Made of rubber



The technology

The patented PASER 3 cutting head system provides you with special advantages in your application: The cutting head itself consists of just five components. When the orifice is changed, it automatically adjusts to centre. This is the only way to ensure that it can be changed or realigned quickly and easily.

more

Cutting Heads

PASER® 3–WMC

main menu

section menu

710350-1 **Height sensor foot**

For height sensor

A-11078 **Carbide pin**

Suitable for mixing chamber 009940-2

A-11080 **Cap**

For use with mixing chamber 009940-1 and 009940-2.
The cap closes the connection for Vacuum Assist when it is not in use.

The technology

The patented PASER 3 cutting head system provides you with special advantages in your application: The cutting head itself consists of just five components. When the orifice is changed, it automatically adjusts to centre. This is the only way to ensure that it can be changed or realigned quickly and easily.

more

Cutting Heads

PASER® II

main menu

section menu

★002986-1 **Mixing chamber assembly**

Includes retainer collet, retainer nut, insert, alignment flange gasket, pivot nut, chamber seal gasket and adjustment knob.

002983-1 **Retainer collet**

★002984-1 **Retainer nut**

002985-1 **Insert**

B-7816-1 **Alignment flange gasket**

C-5626-1 **Pivot nut**

The technology

The PASER II cutting head system can be adjusted or focused using 3 adjustment knobs.

more

Cutting Heads

PASER® II

main menu

section menu

B-7817-1 Chamber seal gasket

★B-8079-1 Adjustment knob

The technology

The PASER II cutting head system can be adjusted or focused using 3 adjustment knobs.

ON/OFF Valves

Version 1 for PASER II and PASER® 3

main menu

section menu

001323-1 Actuator assembly, normally closed

006143-1 High-pressure valve body

001112-1 Retainer cap

001959-1 ON/OFF valve repair kit, version 1

Includes large O-ring, poppet seat, poppet, small O-ring, seal, and back-up ring

The technology

ON/OFF valves are mounted before the orifice in order to switch on and off the flow of the high-pressure water to the orifice.

more

ON/OFF Valves

Version 2 for PASER® 3

main menu

section menu

★003840-1 **Actuator assembly, normally closed**

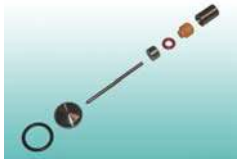
★010104-1 **High-pressure valve body**

Does not include weep tube

★003845-1 **Weep tube**

Suitable for high-pressure valve body 010104-1.

★004096-1 **Seal retainer assembly**



010200-1 **ON/OFF valve repair kit, version 2**

Consisting of large O-ring, poppet seat, poppet, bushing, small O-ring, seal, and back-up ring.

photo unavailable

A-0935-4 **Connector**

The technology

ON/OFF valves are mounted before the orifice in order to switch on and off the flow of the high-pressure water to the orifice.

Nozzle Bodies and Retainers

For ON/OFF valves, version 1 and 2

main menu

section menu

001819-1 Nozzle body, short

Length 2.07 in. (53 mm)
For water-only applications.

001995-1 Nozzle body, short

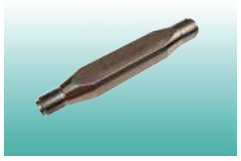
Length 4.33 in. (110 mm)
For abrasive cutting heads PASER® 3, WMC, and PASER II.

001995-2 Nozzle body, long

Length 8.11 in. (206 mm)
For water-only applications.

★**001995-3** Nozzle body

Length 6.33 in. (161 mm)
For water-only applications.



004009-X Nozzle body, standard

★004009-1 Length 5.50 in. (140 mm)
★004009-2 Length 8.08 in. (205 mm)
★004009-3 Length 3.84 in. (98 mm)
★004009-4 Length 6.20 in. (158 mm)
★004009-5 Length 4.33 in. (110 mm)
★004009-6 Length 9.25 in. (235 mm)
For water-only applications.

The technology

The length of the nozzle body depends on your specific application. The long nozzle body is used to adjust the length when cutting with water-only.

more

Nozzle Bodies and Retainers

For ON/OFF valves, version 1 and 2

main menu

section menu

006145-1 — **Nozzle body**

Length 5.49 in. (139 mm)
For water-only applications.

B-5331-X — **Nozzle body**

B-5331-1 — Length 2.42 in. (62 mm)
★B-5331-2 — Length 3.42 in. (87 mm)
For water-only applications.

006146-1 — **Nozzle retainer**

Suitable for nozzle body 006145-1

B-1041-1 — **Nozzle retainer**

Suitable for nozzle bodies 001995-X, 001819-1, and 004009-X.

B-5330-1 — **Nozzle retainer**

Suitable for nozzle body B-5331-X.

★B-5330-2 — **Nozzle retainer**

Suitable for nozzle body B-5331-X.

The technology

The length of the nozzle body depends on your specific application. The long nozzle body is used to adjust the length when cutting with water-only.

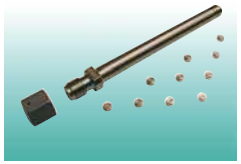
more

Nozzle Bodies and Retainers

For ON/OFF valves, version 1 and 2

main menu

section menu



★012942-1

Waterjet conversion kit

Includes 1 each of nozzle body length 8.11 in. (206 mm) and nozzle retainer, plus 10 orifice assemblies (standard) with internal dia. 0.007 in. (0.178 mm).

For changing the abrasive cutting head systems PASER 3 and PASER II to water-only applications.

The technology

The length of the nozzle body depends on your specific application. The long nozzle body is used to adjust the length when cutting with water-only.

more

Nozzle Bodies and Retainers

For WMC cutting system

main menu

section menu

012990-1 **Waterjet kit, WMC**

Includes 1 each of nozzle body, nozzle retainer, in-line filter, conical insert, and conical orifice assembly with internal diameter 0.006 in. (0.152 mm).

For changing the abrasive cutting head system PASER 3-WMC over to water-only applications.

The technology

The length of the nozzle body depends on your specific application. The long nozzle body is used to adjust the length when cutting with water only.

Orifice Assemblies

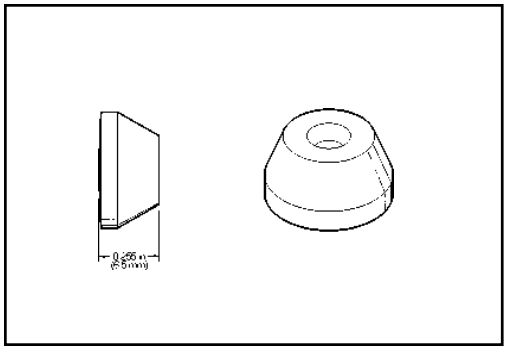
For PASER 3 and PASER 3–WMC

main menu

section menu

009519-X	Orifice assembly, conical
009519-7	internal dia. 0.007 in. (0.178 mm)
★009519-8	internal dia. 0.008 in. (0.203 mm)
★009519-9	internal dia. 0.009 in. (0.229 mm)
009519-10	internal dia. 0.010 in. (0.254 mm)
009519-11	internal dia. 0.011 in. (0.279 mm)
★009519-12	internal dia. 0.012 in. (0.305 mm)
009519-13	internal dia. 0.013 in. (0.330 mm)
009519-14	internal dia. 0.014 in. (0.356 mm)
★009519-16	internal dia. 0.016 in. (0.406 mm)
009519-18	internal dia. 0.018 in. (0.457 mm)

Other sizes available on request.



Specifications

Material: ruby
Suitable for: cutting heads PASER 3 and PASER 3–WMC (abrasive)
Use: generating the waterjet

For more information see Section 10: Water Flow Rate

more

Orifice Assemblies

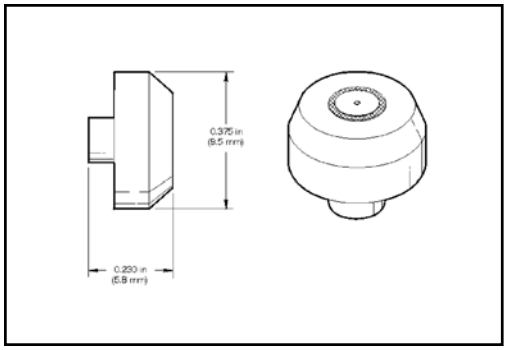
For WMC and other water-only applications using 004009-X nozzle body

main menu | section menu

004519-X	Orifice assembly, conical 60°
004519-3	internal dia. 0.003 in. (0.076 mm)
004519-4	internal dia. 0.004 in. (0.102 mm)
004519-5	internal dia. 0.005 in. (0.127 mm)
004519-6	internal dia. 0.006 in. (0.152 mm)
004519-7	internal dia. 0.007 in. (0.178 mm)
004519-8	internal dia. 0.008 in. (0.203 mm)
004519-9	internal dia. 0.009 in. (0.229 mm)
004519-10	internal dia. 0.010 in. (0.254 mm)
★004519-11	internal dia. 0.011 in. (0.279 mm)
★004519-12	internal dia. 0.012 in. (0.305 mm)
004519-13	internal dia. 0.013 in. (0.330 mm)
★004519-14	internal dia. 0.014 in. (0.356 mm)
★004519-15	internal dia. 0.015 in. (0.381 mm)
★004519-16	internal dia. 0.016 in. (0.406 mm)

Other sizes available on request.

For more information see Section 10: Water Flow Rate



Specifications

Material: sapphire
Suitable for: cutting head WMC, for water-only applications
Use: generating the waterjet
Note: for changing the cutting head WMC over to water-only applications, the waterjet kit 012990-1 is needed. (See Nozzle Bodies and Retainers in this section.)

more

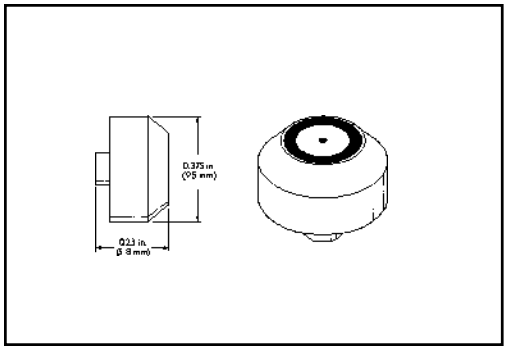
Orifice Assemblies

For WMC and other water-only applications using 004009-X nozzle body

main menu
section menu

D-5071-X	Orifice assembly, conical
★D-5071-3	internal dia. 0.003 in. (0.076 mm)
D-5071-4	internal dia. 0.004 in. (0.102 mm)
D-5071-5	internal dia. 0.005 in. (0.127 mm)
D-5071-6	internal dia. 0.006 in. (0.152 mm)
D-5071-7	internal dia. 0.007 in. (0.178 mm)
D-5071-8	internal dia. 0.008 in. (0.203 mm)
★D-5071-9	internal dia. 0.009 in. (0.229 mm)
D-5071-10	internal dia. 0.010 in. (0.254 mm)
★D-5071-11	internal dia. 0.011 in. (0.279 mm)
★D-5071-12	internal dia. 0.012 in. (0.305 mm)
★D-5071-13	internal dia. 0.013 in. (0.330 mm)
★D-5071-14	internal dia. 0.014 in. (0.356 mm)
★D-5071-15	internal dia. 0.015 in. (0.381 mm)
★D-5071-16	internal dia. 0.016 in. (0.406 mm)

Other sizes available on request.



Specifications

Material: diamond
Suitable for: water-only applications
Use: generating the waterjet

For more information see Section 10: Water Flow Rate

more

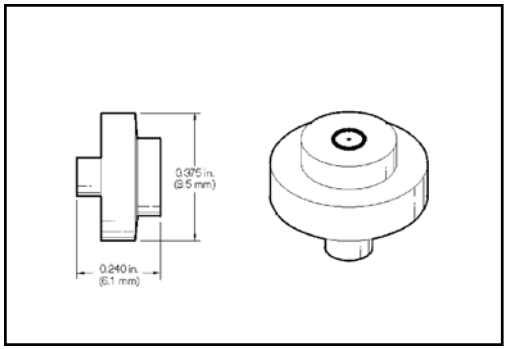
Orifice Assemblies

For PASER II and water-only applications using 001995-X nozzle body

main menu
section menu

001821-X	Orifice assembly, standard
★001821-3	internal dia. 0.003 in. (0.076 mm)
001821-4	internal dia. 0.004 in. (0.102 mm)
001821-5	internal dia. 0.005 in. (0.127 mm)
001821-6	internal dia. 0.006 in. (0.152 mm)
001821-7	internal dia. 0.007 in. (0.178 mm)
001821-8	internal dia. 0.008 in. (0.203 mm)
001821-9	internal dia. 0.009 in. (0.229 mm)
001821-10	internal dia. 0.010 in. (0.254 mm)
001821-11	internal dia. 0.011 in. (0.279 mm)
001821-12	internal dia. 0.012 in. (0.305 mm)
001821-13	internal dia. 0.013 in. (0.330 mm)
001821-14	internal dia. 0.014 in. (0.356 mm)
★001821-15	internal dia. 0.015 in. (0.381 mm)
001821-16	internal dia. 0.016 in. (0.406 mm)
★001821-17	internal dia. 0.017 in. (0.432 mm)
001821-18	internal dia. 0.018 in. (0.457 mm)
001821-19	internal dia. 0.019 in. (0.483 mm)
	Other sizes available on request.

For more information see Section 10: Water Flow Rate



Specifications

Material: sapphire
Suitable for: cutting head PASER II (abrasive) and for water-only applications
Use: generating the waterjet

more

Orifice Assemblies

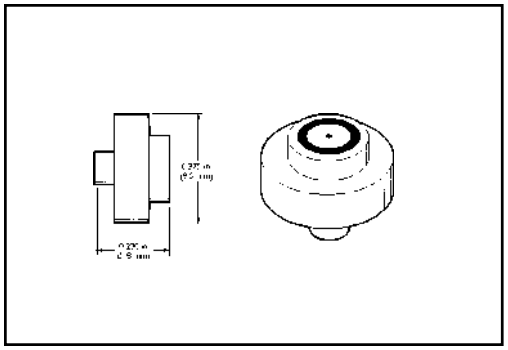
For PASER II and water-only applications using 001995-X nozzle body

main menu

section menu

D-5070-X	Orifice assembly, standard
★D-5070-3	internal dia. 0.003 in. (0.076 mm)
★D-5070-4	internal dia. 0.004 in. (0.102 mm)
★D-5070-5	internal dia. 0.005 in. (0.127 mm)
★D-5070-6	internal dia. 0.006 in. (0.152 mm)
★D-5070-7	internal dia. 0.007 in. (0.178 mm)
★D-5070-8	internal dia. 0.008 in. (0.203 mm)
★D-5070-9	internal dia. 0.009 in. (0.229 mm)
★D-5070-10	internal dia. 0.010 in. (0.254 mm)
★D-5070-11	internal dia. 0.011 in. (0.279 mm)
★D-5070-12	internal dia. 0.012 in. (0.305 mm)
★D-5070-13	internal dia. 0.013 in. (0.330 mm)
★D-5070-15	internal dia. 0.015 in. (0.381 mm)
★D-5070-16	internal dia. 0.016 in. (0.406 mm)
★D-5070-18	internal dia. 0.018 in. (0.457 mm)

Other sizes available on request.



Specifications

Material: diamond
Suitable for: cutting head PASER II (abrasive) and for water-only applications
Use: generating the waterjet

For more information see Section 10: Water Flow Rate

more

Orifice Assemblies

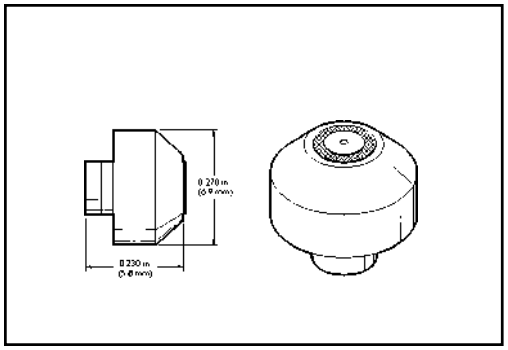
For water-only applications using 006145-1 nozzle body

main menu | section menu

003788-X	Orifice assembly, standard
003788-3	internal dia. 0.003 in. (0.076 mm)
003788-4	internal dia. 0.004 in. (0.102 mm)
003788-5	internal dia. 0.005 in. (0.127 mm)
003788-6	internal dia. 0.006 in. (0.152 mm)
003788-7	internal dia. 0.007 in. (0.178 mm)
003788-8	internal dia. 0.008 in. (0.203 mm)
003788-9	internal dia. 0.009 in. (0.229 mm)
003788-10	internal dia. 0.010 in. (0.254 mm)
003788-11	internal dia. 0.011 in. (0.279 mm)
003788-12	internal dia. 0.012 in. (0.305 mm)
003788-13	internal dia. 0.013 in. (0.330 mm)
★003788-14	internal dia. 0.014 in. (0.356 mm)
★003788-15	internal dia. 0.015 in. (0.381 mm)
★003788-16	internal dia. 0.016 in. (0.406 mm)
★003788-17	internal dia. 0.017 in. (0.432 mm)
★003788-18	internal dia. 0.018 in. (0.457 mm)
★003788-19	internal dia. 0.019 in. (0.483 mm)

Other sizes available on request.

For more information see Section 10: Water Flow Rate



Specifications

Material: sapphire
Suitable for: water-only applications
Use: generating the waterjet

Mixing Tubes

For PASER 3, PASER 3–WMC, and PASER II

main menu

section menu

010460-XX-XX Mixing tube Qbic 30*plus*, standard sizes

010460-30-30	Length 3 in. (76.20 mm), Internal dia. 0.030 in. (0.762 mm) Typically used with 80 and 120 mesh garnet
010460-40-30	Length 3 in. (76.20 mm), Internal dia. 0.040 in. (1.016 mm) Typically used with 80 mesh garnet
010460-50-35	Length 3.5 in. (88.90 mm), Internal dia. 0.050 in. (1.270 mm) Typically used with 50 mesh garnet

010460-XX-XX Mixing tube Qbic 30*plus*, special sizes

010460-20-20	Length 2 in. (50.80 mm), Internal dia. 0.020 in. (0.508 mm)
★010460-15-25	Length 2.5 in. (63.50 mm), Internal dia. 0.015 in. (0.381 mm)
010460-20-30	Length 3 in. (76.20 mm), Internal dia. 0.020 in. (0.508 mm)
★010460-30-40	Length 4 in. (101.6 mm), Internal dia. 0.030 in. (0.762 mm)
010460-40-40	Length 4 in. (101.6 mm), Internal dia. 0.040 in. (1.016 mm)
010460-60-40	Length 4 in. (101.6 mm), Internal dia. 0.060 in. (1.524 mm)
★010460-70-40	Length 4 in. (101.6 mm), Internal dia. 0.070 in. (1.778 mm)

Specifications

Suitable for: cutting heads PASER 3, PASER 3–WMC, and PASER II

Use: to mix abrasive and water, generating the focused abrasive waterjet

more

Mixing Tubes

For PASER 3, PASER 3–WMC, and PASER II

main menu

section menu

012680-XX-XX Mixing tube Qbic 20, standard sizes

012680-30-30	Length 3 in. (76.20 mm), Internal dia. 0.030 in. (0.762 mm)
012680-40-30	Length 3 in. (76.20 mm), Internal dia. 0.040 in. (1.016 mm)

012680-XX-XX Mixing tube Qbic 20, special sizes

★012680-20-20	Length 2 in. (50.80 mm), Internal dia. 0.020 in. (0.508 mm)
★012680-50-35	Length 3.5 in. (88.90 mm), Internal dia. 0.050 in. (1.270 mm)

Specifications

Suitable for: cutting heads PASER 3, PASER 3–WMC, and PASER II

Use: to mix abrasive and water, generating the focused abrasive waterjet

Metering Valves

For PASER 3

main menu

section menu

009925-1 **Mini hopper**

★009928-1 **Shroud**

Made of transparent, impact-resistant plastic.

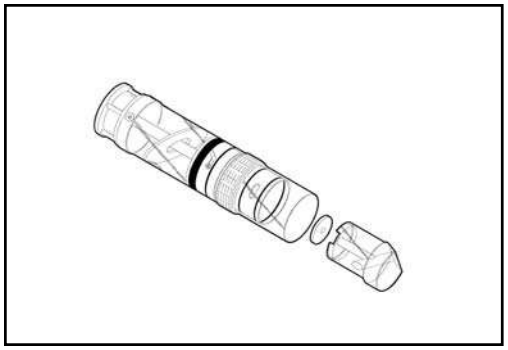
★009929-1 **Locking diverter**

A-0275-126 **O-ring**

For locking diverter 009929-1.

A-11073 **Rubber bumper**

For more information see Section 10: Abrasive Flow Rate



The technology

The PASER 3 metering valve always delivers the correct quantity of abrasive media. A metering disc preselects the optimum quantity of abrasive appropriate to the water pressure and flow. This makes it easy to handle, cuts down on wear, and always provides the best cutting conditions.

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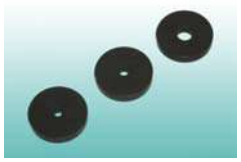
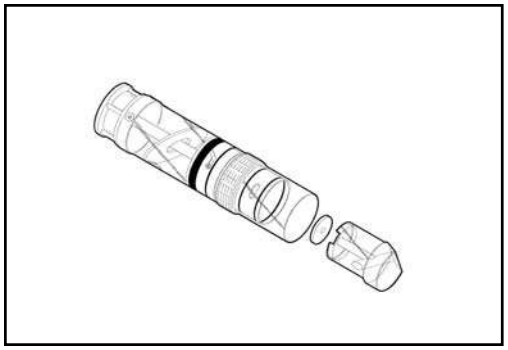
Metering Valves
For PASER 3

main menu | section menu



009931-X	Metering discs
009931-1	Internal dia. 0.154 in. (3.91 mm)
009931-2	Internal dia. 0.168 in. (4.27 mm)
009931-3	Internal dia. 0.184 in. (4.67 mm)
009931-4	Internal dia. 0.196 in. (4.98 mm)
009931-5	Internal dia. 0.206 in. (5.23 mm)
009931-6	Internal dia. 0.215 in. (5.46 mm)
009931-7	Internal dia. 0.222 in. (5.64 mm)
009931-8	Internal dia. 0.229 in. (5.82 mm)
009931-9	Internal dia. 0.237 in. (6.02 mm)
009931-10	Internal dia. 0.246 in. (6.25 mm)
009931-11	Internal dia. 0.255 in. (6.48 mm)
009931-12	Internal dia. 0.263 in. (6.68 mm)
009931-13	Internal dia. 0.269 in. (6.83 mm)
009931-14	Internal dia. 0.275 in. (6.99 mm)
009931-15	Internal dia. 0.281 in. (7.14 mm)
009931-16	Internal dia. 0.288 in. (7.32 mm)
009931-17	Internal dia. 0.295 in. (7.49 mm)
009931-18	Internal dia. 0.302 in. (7.67 mm)



The technology

The PASER 3 metering valve always delivers the correct quantity of abrasive media. A metering disc preselects the optimum quantity of abrasive appropriate to the water pressure and flow. This makes it easy to handle, cuts down on wear, and always provides the best cutting conditions.

For more information see Section 10: Abrasive Flow Rate

Section 4
FLOW Intensifier Pumps

main menu

Section Menu

Flow

Overview of Products

For ultrahigh-pressure intensifier pumps

main menu section menu

The technology

For more than thirty years FLOW has pioneered and led the development and construction of ultrahigh-pressure pumps for waterjet applications. We produce two types of ultrahigh-pressure pumps: intensifier, and triplex or direct drive.

Intensifier pumps have long been the industry standard technology and reliably produce some of the highest operating pressures used in industry today. Currently, all FLOW intensifier pumps achieve continuous working pressures of 60,000 psi. In some special appplications, they can be utilized to reliably produce pressures of up to 87,000 psi.

FLOW has continued to advance the development of intensifier technology. Our advances have resulted in increased productivity as a result of increased working pressures and service life. For example, with FLOW's recent 60,000 psi upgrade kit it became possible for a customer to convert an existing 55,000 psi pump to 60,000 psi continuous operation. The result? An 8–12% increase in cutting speed (all other variables remaining constant). The current standard is 60,000 psi in the latest generation of FLOW intensifier pumps.

Over the years, FLOW has supplied well over 7,000 pumps throughout the world. There are several models on the market, each with different designations. These model descriptions are explained in detail on the following page.

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Overview of Products

For ultrahigh-pressure intensifier pumps

main menu section menu

The models

Model names incorporate some basic information about each pump. Some examples of names are 7XS-40 H.O., 20XD-55 ESL, and 50iS-60.

The initial figures identify the model series:

Standard pump series are 5X, 7X, 9X, 9XV, 20X, 20XW, and 25X.
Integrated pump series are 50iS and 100iD.

The next figures indicate the number of intensifiers:

XS, iS	=	one intensifier (single)
XD, iD	=	two intensifiers (dual)
XR	=	two intensifiers that can be used in redundant operation
XT	=	three intensifiers (triple)
XQ	=	four intensifiers (quad)

The following numbers represent the maximum continuous working pressure:

40	=	40,000 psi [2,750 bar], intensification ratio 13:1
55	=	55,000 psi [3,800 bar], intensification ratio 20:1
60	=	60,000 psi [4,150 bar], intensification ratio 20:1

Other data at the end of the model name indicates the generation of the pump:

H.O.	=	high output; this generation of pumps was supplied in the years from 1992 until the beginning of 1998; **tungsten carbide plungers**
ESL	=	extended seal life; the state-of-the-art generation of pumps with **ceramic plungers**

Additional Information

Since mid-1999 the 7X, 20X, 50iS, and 100iD series pumps have been supplied exclusively with control contacts electrically connected. Before that time the mechanical control contact system was standard (except the 11X Mark II and 25X series).

The maximum pumping rate, measured in gallons per minute (gpm) or liters per minute (lpm), is determined by the connection capacity, the number of intensifiers, and the maximum working pressure of the pump. This in turn determines the maximum possible orifice size. Section 10 “Product and Technical Information” contains a water flow rate table showing pressure as it relates to orifice diameter.

The model number contains no information about the motor power or maximum pumping capacity of a pump.
Pumps are available with 30 hp, 50 hp, 60hp, or 100 hp connections.

more

Overview of Products

For ultrahigh-pressure intensifier pumps

The current range of models:

Model #	Max. motor power	Output flow rate
5XS-55 ESL	30 hp [22 kW]	0.50 gpm [1.91 lpm]
7XS-60 ESL	50 hp [37 kW]	1.00 gpm [3.76 lpm]
7XD-60 ESL	60 hp [45 kW]	1.24 gpm [4.51 lpm]
7XR-60 ESL	50 hp [37 kW]	1.00 gpm [3.76 lpm]
20XS-60 ESL	50 hp [37 kW]	1.00 gpm [3.76 lpm]
20XD-60 ESL	100 hp [75 kW]	2.00 gpm [7.60 lpm]
20XR-60 ESL	50 hp [37 kW]	1.00 gpm [3.76 lpm]
25XT-40 ESL	150 hp [112 kW]	4.71 gpm [17.80 lpm]
25XT-60 ESL	150 hp [112 kW]	3.00 gpm [11.37 lpm]
25XQ-40 ESL	200 hp [150 kW]	5.65 gpm [21.40 lpm]
25XQ-60 ESL	200 hp [150 kW]	3.60 gpm [13.64 lpm]
50iS	50 hp [37 kW]	1.00 gpm [3.76 lpm]
100iD	100 hp [75 kW]	2.00 gpm [7.60 lpm]

In addition to the current pump models, over the last 10 years other models have been sold under different designations. Models manufactured before 1990 are not mentioned here in detail (for example, the Mark II and 6X).

Types 5X:	5XS-40 H.O.
	5XS-55 H.O.
Types 7X:	7XS-40 H.O.
	7XS-55 H.O.; 7XD-55 H.O.; 7XR-55 H.O.; with 30hp, 40 hp, 50 hp, and 60 hp
	7XS-55 ESL; 7XD-55 ESL; 7XR-55 ESL; with 50 hp, and 60 hp
Types 9X:	similar models named 9X or 9XV, but which are identical to the 7X models
Types 20X:	similar models with 55 H.O. and 55 ESL
Types 25X:	similar models with 55 H.O. and 55 ESL

Conversions and upgrades

We recommend customers convert all of their older pumps to meet the latest technology. All H.O. models can be upgraded to ESL. All 55,000 psi ESL models can be upgraded to 60,000 psi ESL. In this way, you achieve greater working pressures and ensure the highest productivity while maintaining a long service life. For safety reasons, an upgrade to 60,000 psi ESL requires a change of pressure attenuator.

High-Pressure Components

For more information, see manual M-127

Small High-Pressure Components

main menu

section menu

007038-3 **High-pressure cylinder**

Suitable for intensifier 60K-ESL. Can also be used for intensifiers 55K-ESL and 55K-H.O.

007038-2 **High-pressure cylinder**

Suitable for intensifier 40K-H.O.

B-1002-2 **Back-up seal sleeve**

Suitable for intensifier 60K-ESL. Can also be used for intensifiers 55K-ESL and 55K-H.O.

B-6313-2 **Back-up seal sleeve**

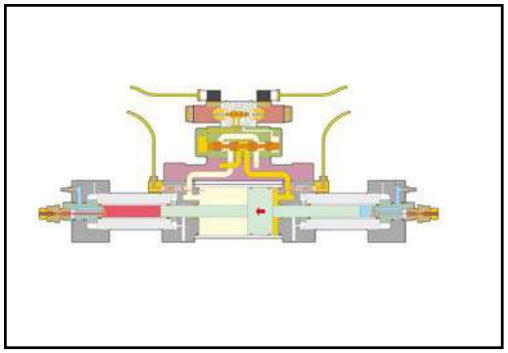
Suitable for intensifier 40K-H.O.

010253-1 **High-pressure plunger**

Made of ceramic. Suitable for intensifier 60K-ESL. Can also be used for intensifier 55K-ESL.

010281-1 **Retrofit kit from H.O. to ESL**

Includes 2 ceramic plungers, 2 ESL check valve repair kits, and 1 high-pressure seal kit.
Suitable for intensifier 55K-H.O.



The technology

The FLOW ultrahigh-pressure pump is the heart of the waterjet cutting system. At FLOW we have been developing our own pump systems since 1974. Patented FLOW pressure intensifiers and the extra large volume pressure accumulator provide incomparable pressure stability and jet quality. Ceramic piston rods and special sealing materials ensure maximum endurances.

more

High-Pressure Components

For more information, see manual M-127

Small High-Pressure Components

main menu

section menu

004383-3 **Main check valve body**

Suitable for intensifiers 60K-ESL, 55K-ESL, 55K-H.O.

004383-2 **Main check valve body**

Suitable for intensifier 40K-H.O.

C-1313-1 **Outlet body**

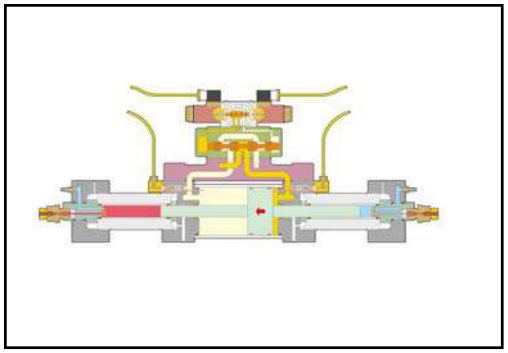
Suitable for intensifiers 60K-ESL, 55K-ESL, 55K-H.O., and 40K-H.O.

002192-1 **Check valve temperature sensor**

321276-1 **Check valve end cap**

010642-1 **Check valve repair kit**

Includes outlet poppet, insert, screw, inlet poppet, spring, O-rings, and check valve support assembly.
Suitable for intensifiers 60K-ESL, 55K-ESL, 55K-H.O., and 40K-H.O.



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High-Pressure Components

For more information, see manual M-127

Small High-Pressure Components

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B-1814-1 **Check valve repair kit**

Includes outlet poppet, inlet poppet, insert, screw, spring, spacer, and O-rings.
For non-H.O. and non-ESL intensifiers.

001198-1 **High-pressure seal kit**

Includes grease, seal rings, hgih-pressure seals, seal hoops, and O-rings.
Suitable for intensifier 55K-ESL, 55K-H.O., and 60K-ESL.

001197-1 **High-pressure seal kit**

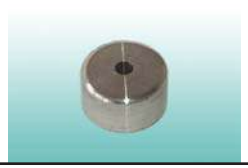
Includes grease, seal rings, hgih-pressure seals, seal hoops, and O-rings.
Suitable for intensifier 40K-H.O.

010011-1 **Inlet poppet**

Suitable for intensifiers 60K-ESL, 55K-ESL, 55K-H.O., and 40K-H.O.

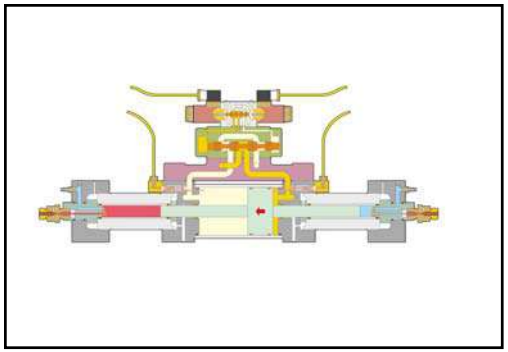
004380-1 **Inlet retaining screw**

Suitable for intensifiers 60K-ESL, 55K-ESL, 55K-H.O., and 40K-H.O.



004382-1 **Insert**

Suitable for intensifiers 60K-ESL, 55K-ESL, 55K-H.O., and 40K-H.O.



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High-Pressure Components

For more information, see manual M-127

Small High-Pressure Components

main menu

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005917-1 **Outlet poppet**

Suitable for intensifiers 60K-ESL, 55K-ESL, 55K-H.O., | and 40K-H.O.

A-1606 **Compression spring**

Made of stainless steel.
Suitable for intensifiers 60K-ESL, 55K-ESL, 55K-H.O., and 40K-H.O.

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C-5841-1 **Bleed Down Valve Assembly**

For all intensifier pumps.

000817-1 **High-pressure in-line filter assembly, 3/8 in.**

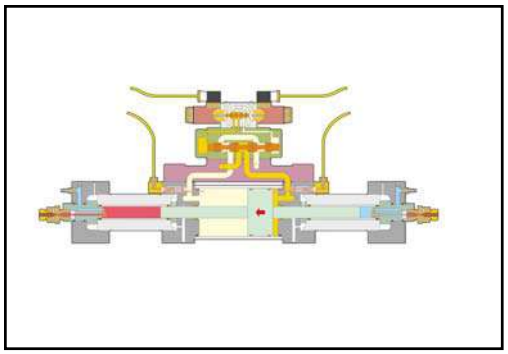
For all cutting tables.

000905-1 **High-pressure in-line filter assembly, 1/4 in.**

For all cutting tables.

B-1313-1 **In-line filter screen**

For use with 000817-1 and 000905-1.



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High-Pressure Components

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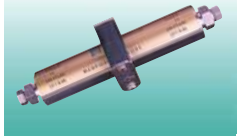
★A-13816 **High-pressure in-line filter**



★012832-1 **High-pressure in-line filter assembly, 5 micron**

For use with A-13816

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★B-8345-1 **Electronic shift sensor assembly**

For use with mechanical shift intensifier

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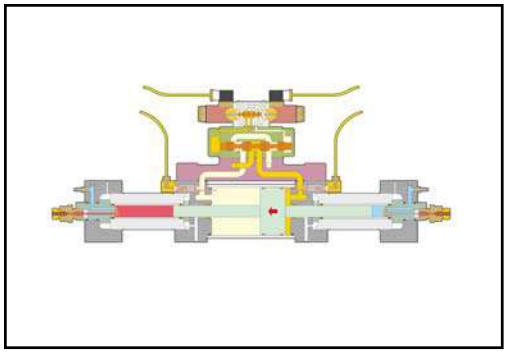
★B-8346-1 **Electronic Actuator assembly**

For use with mechanical shift intensifier

004694-1 **Bleed down valve repair kit**

Includes back-up ring, bushing, seals, high-pressure valve stem, and O-rings.
Suitable for all FLOW pumps as of 1992 (year of manufacture)



The technology

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Low-Pressure Components

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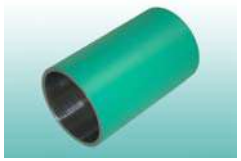


C-1000-1 **Low-pressure cylinder**

Suitable for intensifiers 60K-ESL, 55K-ESL, 55K-H.O., and 40K-H.O.

010641-1 **Low-pressure seal kit ESL**

Includes O-rings, back-up rings, and seals.
Suitable for intensifiers 60K-ESL and 55K-ESL

B-1163-1 **Low-pressure seal kit H.O.**

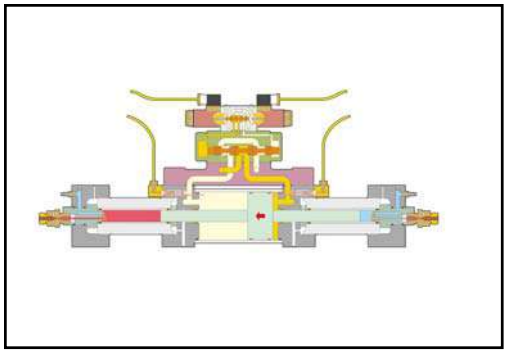
Includes O-rings, back-up rings, and seals.
Suitable for intensifier 55K-H.O.

B-1702-1 **Firing pin, electrical shift**

Suitable for intensifiers 60K-ESL and 55K-ESL.

002226-1 **Actuator (firing) pin, mechanical shift**

Suitable for intensifiers 55K-ESL, 55K-H.O., and 40K-H.O.



The technology

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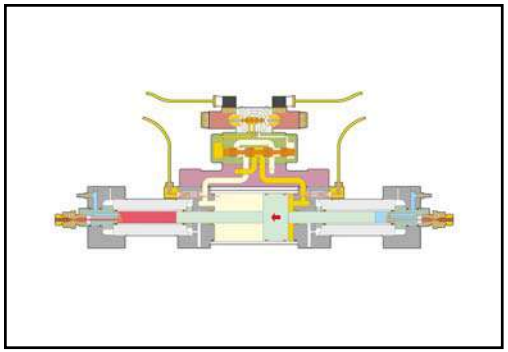
more

Low-Pressure Components

B-1611-1 **Shifting pin**

For use with mechanical shift intensifiers.



The technology

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Water Filters

A-1453 **Filter cartridge, 10 micron**

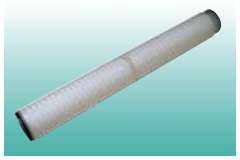
Length 10 in. (254 mm)
Suitable for 5X, 7X, and 20XW pumps.

A-1555 **Filter cartridge, 1 micron**

Length 10 in. (254 mm)
Suitable for 5X, 7X, and 20XW pumps.

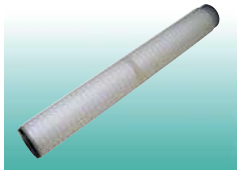
A-1449 **Filter cartridge, 0.45 micron**

Length 10 in. (254 mm)
Suitable for 5X, 7X, and 20XW pumps.



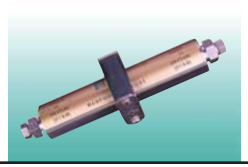
A-00562-2 **Filter cartridge, 1 micron**

Length 20 in. (508 mm),
Suitable for pump 50iS only.



A-00562-1 **Filter cartridge, 0.45 micron**

Length 20 in. (508 mm),
Suitable for pump 50iS only.



012832-1 **High-pressure in-line filter assy; 5 micron**

Suitable for all cutting tables.

The technology

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Accessories

★A-10109 **Belt, v-link 3/8 inch**

For use with 7X, 20X, and 20XW booster pumps.

A-8466 **Medical alert card**

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5X Pump

Spare and Consumable Parts

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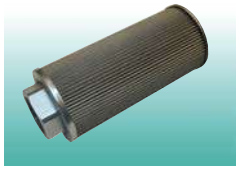
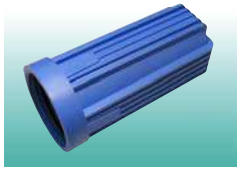
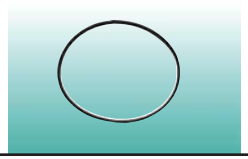
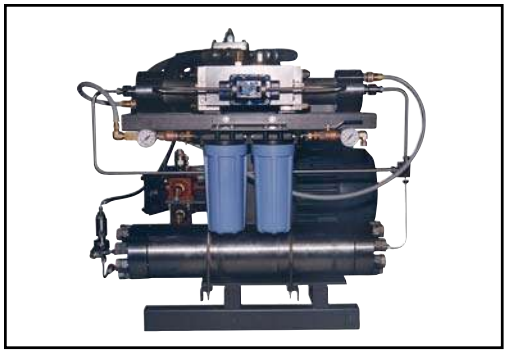
photo unavailable	A-5480	Return oil Filter
	A-3582	Suction oil filter
	A-1555	Water filter cartridge, 1 micron Length 10 in. (254 mm)
	A-1449	Water filter cartridge, 0.45 micron Length 10 in. (254 mm)
	A-6060	Filter bowl
	★A-8417	O-ring For filter bowl A-6060



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more

5X Pump

Spare and Consumable Parts

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A-6059

Filter head

For use with 5X, 7X, 20X, 20XW, and 25X pumps.

★A-0275-210

O-ring

For filter head A-6059

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★A-7226

Hydraulic pump, 2.3 cubic in.

★A-6468

Oil gauge

0-5000 psi

A-2171

Inlet water gauge

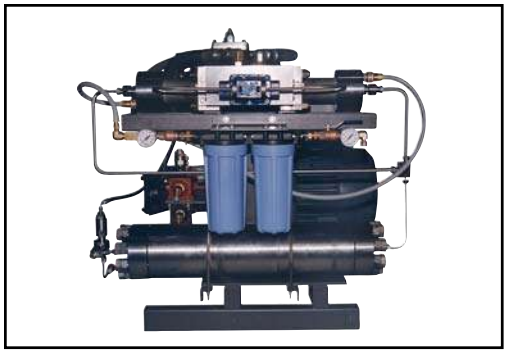
0-160 psi

photo unavailable

★009507-1

Sensor kit

Includes warning and shutdown switches for low-pressure inlet water, oil level, oiL temperature, check valve, and bleed down valve.



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7X Pump

Spare and Consumable Parts

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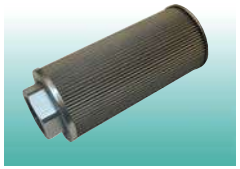
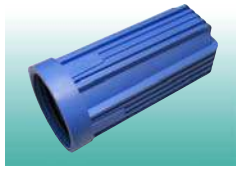
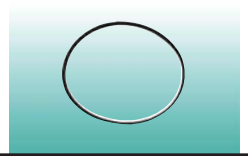
photo unavailable	A-5480	Return Oil Filter
	A-3582	Suction oil filter
	A-1555	Water filter cartridge, 1 micron Length 10 in. (254 mm)
	A-1449	Water filter cartridge, 0.45 micron Length 10 in. (254 mm)
	A-6060	Filter bowl
	A-8417	O-ring ★ For filter bowl A-6060

The technology

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more

7X Pump

Spare and Consumable Parts

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A-6059

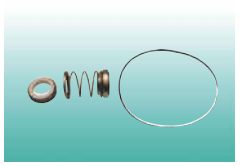
Filter head

For use with 5X, 7X, 20X, 20XW, and 25X pumps.

★A-0275-210

O-ring

For filter head A-6059



★A-12400

Seal kit

Includes O-ring, seal, and seat.
For inlet water boost pump

★A-10109

Drive Belt

For inlet water boost pump

★A-6468

Oil gauge

0-5000 psi

A-2171

Inlet water gauge

0-160 psi

The technology

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more

7X Pump

Spare and Consumable Parts

★008653-1 **Sensor kit, single**

Includes warning switches for low inlet water pressure, check valve, and bleed down valve.

★008653-2 **Sensor kit, dual**

Includes warning switches for low inlet water pressure, check valve, and bleed down valve.

The technology

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20X and 20XW Pumps

Spare and Consumable Parts

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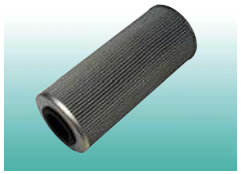

A-9081 **Tank oil filter**

For 20X and 20XW pumps.

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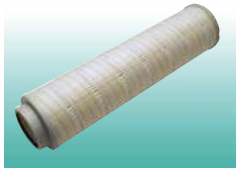
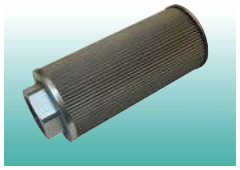
A-3825 **Canister oil filter**

For 20X pump only.



A-11367 **Canister oil filter, 6 micron**

For 20XW pump only
Length: 13 in. (330.2 mm)



A-3582 **Suction oil filter**

For 20X and 20XW pumps.

A-1555 **Water filter cartridge, 1 micron**

Length 10 in. (254 mm)

A-1449 **Water filter cartridge, 0.45 micron**

Length 10 in. (254 mm)

The technology

The FLOW ultrahigh-pressure pump is the heart of the waterjet cutting system. At FLOW we have been developing our own pump systems since 1974. Patented FLOW pressure intensifiers and the extra large volume pressure accumulator provide incomparable pressure stability and jet quality. Ceramic piston rods and special sealing materials ensure maximum endurances.

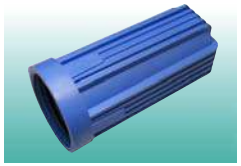
more

20X and 20XW Pumps

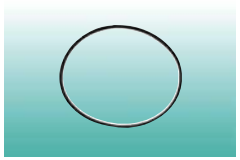
Spare and Consumable Parts

main menu

section menu



A-6060 **Filter bowl**



★A-8417 **O-ring**

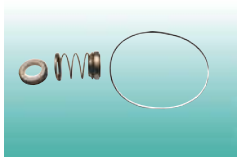
For filter bowl A-6060

A-6059 **Filter head**

For use with 5X, 7X, 20X, 20XW, and 25X pumps.

★A-0275-210 **O-ring**

For filter head A-6059



★A-12400 **Seal kit**

Includes O-ring, seal, and seat.
For inlet water boost pump

★A-10109 **Drive belt**

For inlet water boost pump

The technology

The FLOW ultrahigh-pressure pump is the heart of the waterjet cutting system. At FLOW we have been developing our own pump systems since 1974. Patented FLOW pressure intensifiers and the extra large volume pressure accumulator provide incomparable pressure stability and jet quality. Ceramic piston rods and special sealing materials ensure maximum endurances.

more

20X and 20XW Pumps

Spare and Consumable Parts

main menu

section menu

★A-6468 Oil gauge

0-5000 psi

A-2171 Inlet water gauge

0-160 psi

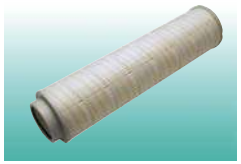
The technology

The FLOW ultrahigh-pressure pump is the heart of the waterjet cutting system. At FLOW we have been developing our own pump systems since 1974. Patented FLOW pressure intensifiers and the extra large volume pressure accumulator provide incomparable pressure stability and jet quality. Ceramic piston rods and special sealing materials ensure maximum endurances.

25X Pump

Spare and Consumable Parts

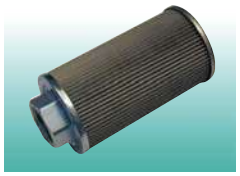
main menu | section menu



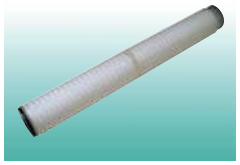
A-11367 Canister oil filter, 13 in.

photo unavailable

★A-11369 Canister oil filter, 16 in.

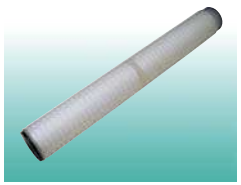


★200682-20 Suction oil filter



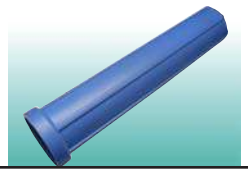
A-00562-2 Water filter cartridge, 1 micron

Length 20 in. (508 mm)



A-00562-1 Water filter cartridge, 0.45 micron

Length 20 in. (508 mm)



★A-10112 Filter bowl

The technology

The FLOW ultrahigh-pressure pump is the heart of the waterjet cutting system. At FLOW we have been developing our own pump systems since 1974. Patented FLOW pressure intensifiers and the extra large volume pressure accumulator provide incomparable pressure stability and jet quality. Ceramic piston rods and special sealing materials ensure maximum endurances.

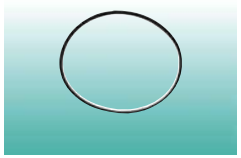
more

25X Pump

Spare and Consumable Parts

main menu

section menu



★A-8417 **O-ring**

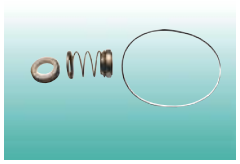
For filter bowl A-10112

A-6059 **Filter head**

For use with 5X, 7X, 20X, 20XW, and 25X pumps.

★A-0275-210 **O-ring**

For filter head A-6059

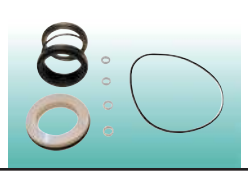


★A-12400 **Seal kit**

For inlet water boost pump

★A-10109 **Drive belt**

For inlet water boost pump



★A-12114 **Shaft seal kit**

For Dennison oil pump

The technology

The FLOW ultrahigh-pressure pump is the heart of the waterjet cutting system. At FLOW we have been developing our own pump systems since 1974. Patented FLOW pressure intensifiers and the extra large volume pressure accumulator provide incomparable pressure stability and jet quality. Ceramic piston rods and special sealing materials ensure maximum endurances.

more

25X Pump

Spare and Consumable Parts

A-1623 Oil gauge

0-5000 psi

A-2171 Inlet water gauge

0-160 psi

The technology

The FLOW ultrahigh-pressure pump is the heart of the waterjet cutting system. At FLOW we have been developing our own pump systems since 1974. Patented FLOW pressure intensifiers and the extra large volume pressure accumulator provide incomparable pressure stability and jet quality. Ceramic piston rods and special sealing materials ensure maximum endurances.

Section 5
FLOW Direct Drive Pumps

main menu

Section Menu

Flow

Eagle Pump

Spare and Consumable Parts

main menu

section menu

013108-1 **300 hour maintenance kit**

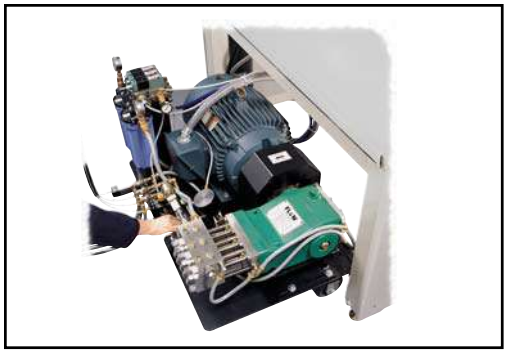
Includes static seals, outlet poppets, guides and seats, inlet poppets, dynamic seals, manifold filter, PCV poppet and seat, rod seals, O-rings, and 320 grit grinding paper

013108-2 **1200 hour maintenance kit**

Includes static seals, outlet poppets, guides and seats, inlet poppets, plungers, high-pressure cylinders, dynamic seals, seal carriers, PCV poppet and seat, rod seals, PCV plunger seals, O-rings, compression springs, check valve bodies, pressure control plunger, PCV bearing assembly, elastic lock nut, back-up rings

★011036-1 **Check valve assembly**

011350-1 **Filler tube sleeve**



The technology

Cougar Pump

Spare and Consumable Parts

main menu

section menu

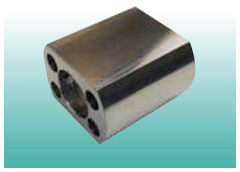
008858-1 Check valve assembly

★006732-1 Cage

For outlet poppet check valve

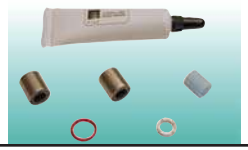
009173-1 Check valve repair kit

Includes inlet poppet, inlet screw, outlet poppet, outlet seat, spring, O-ring, lapping fixture, 320 grit grinding paper.



★008857-1 End cap

★008861-1 High-pressure cylinder



009172-1 High-pressure seal kit

Includes bushing assemblies, grease, back-up ring, O-ring, and dynamic seal.

The technology

more

Cougar Pump

Spare and Consumable Parts

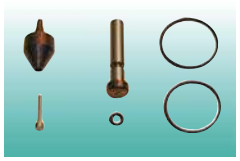
main menu

section menu

009172-2 **High-pressure seal kit**

Includes grease, back-up ring, O-ring, and dynamic seal.

006782-1 **Ceramic plunger assembly**



★009761-1 **PCV repair kit**

Includes seat, poppet, plunger, and O-rings.

★009761-2 **PCV repair kit**

Includes seat, poppet, and O-rings.

The technology

Section 6
FLOW High-pressure Tubing

main menu

Section Menu

High pressure tubing

High-Pressure Tubing

A-00144-X High-pressure tubing

A-00144-1 1/4 in.: I.D.=1.59 mm, O.D.=6.35 mm
A-00144-2 3/8 in.: I.D.=3.20 mm, O.D=9.52 mm
A-00144-3 9/16 in.: I.D.=4.76 mm, O.D.=14.3 mm

For water pressures of up to 65,000 psi [4500 bar]

★B-5077-2 Coning and threading kit

Includes all parts necessary for 1/4, 3/8, and 9/16 inch tubing: collets, cutting lube, tool bits/blades, deburring tool, threading dies, bushing guides

The technology

FLOW waterjet cutting systems cut with continuous working pressures of 4,100 bar and more. All high-pressure tubing and couplings are specially designed to ensure maximum endurances thus offering the best quality and maximum safety.

Section 7
FLOW Tools and Repair Kits

main menu

Section Menu

Tools

For pumps and high-pressure tubing

Repair kits

For pumps and ON/OFF valves

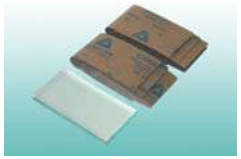
Flow

Tools

For pumps and high-pressure tubing

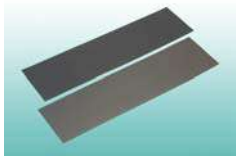
main menu

section menu



B-1813-1 **Lapping kit**

for check valve



Grinding paper

A-1902 grain size 600

A-1903 grain size 320

★B-5077-2 **Coning and threading kit**

Includes all parts necessary for 1/4, 3/8, and 9/16 inch tubing: collets, cutting lube, tool bits/blades, deburring tool, threading dies, bushing guides

B-2817-1 **Swivel seal tool, 3/8 in.**

★B-6263-1 **Swivel seal puller, 1/4 in.**

A-1628 **Spanner Wrench, 2-1/4 in. span**

The technology

For maintaining and repairing FLOW pumps, please use only tools recommended by FLOW which have been specially designed to offer ease of use and best handling.

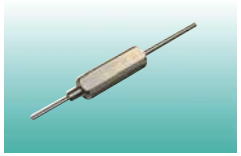
more

Tools

For pumps and high-pressure tubing

main menu

section menu



★C-2690-1 Installation tool

★C-2691-1 Installation tool

B-5716-1 High-pressure valve tool assembly kit

007140-1 Tool kit

Suitable for 60K psi pump

007851-1 Water test kit

The technology

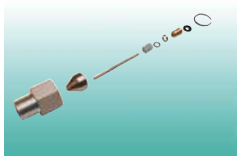
For maintaining and repairing FLOW pumps, please use only tools recommended by FLOW which have been specially designed to offer ease of use and best handling.

Repair Kits

For pumps and ON/OFF valves

main menu

section menu



B-5741-1 **High-pressure valve repair kit**

010642-1 **Check valve repair kit**

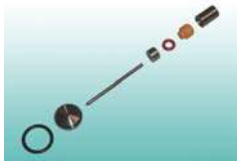
Includes outlet poppet, insert, screw, inlet poppet, spring, O-rings, and check valve support assembly.
Suitable for intensifiers 60K-ESL, 55K-ESL, 55K-H.O., and 40K-H.O.

004694-1 **Bleed down valve repair kit**

Includes back-up ring, O-rings, bushing, seals, high-pressure valve stem, and seat.
Suitable for all FLOW pumps as of 1992 (year of manufacture).

001959-1 **ON/OFF valve repair kit, version 1**

Includes large O-ring, poppet seat, poppet, small O-ring, seal and back-up ring



010200-1 **ON/OFF valve repair kit, version 2**

Includes large O-ring, poppet seat, poppet, bushing, small O-ring, seal and back-up ring

The technology

For maintaining and repairing FLOW pumps and cutting head we offer special repair kits that guarantee quick and easy maintenance. These kits are comprised of all necessary items.

Section 8
FLOW Accessories

main menu

Section Menu

Flow

Garnet Abrasive Overview

main menu
section menu

Safety and quality with
FLOW PASER *Plus* Garnet—the abrasive cutting sand with added value

Garnet sand is the cutting medium that is used in modern abrasivejet cutting processes. Garnet is available on the market in a wide range of qualities and in a wide range of prices. The main application area for garnet is sand blasting. Unlike sand blasting, abrasive waterjet cutting requires very high quality garnet sand in order to ensure high quality processing. The particular requirements are:

- free of dust and debris
- correct distribution of grain size
- correct proportion of aluminium oxide
- production certified as per ISO 9000

In addition to high quality requirements, when selecting a cutting medium you need to consider the highest possible cutting capacity, since abrasive medium consumption alone makes up more than 60 percent of the variable cost of abrasivejet cutting. For this reason, FLOW has optimized its waterjet systems and garnet production with a view to achieve **the lowest cost per cut inch**.

For example, the PASER 3® cutting head guarantees to keep the optimum operating point, water flow rate and quantity of abrasive in the best possible ratios to one another. The result is top cutting speeds at the lowest possible garnet consumption rate.

FLOW PASER *Plus* Garnet also contributes to more productive utilization of waterjet technology. The exceptional quality and correct proportion of aluminium oxide provides high cutting speeds.

FLOW PASER *Plus* comes in grain sizes of 50 mesh, 80 mesh and 120 mesh and can be supplied in 55 lb bags or in 1 metric ton Supersacks.

55 lb Bags


1 metric ton
Supersack

more

PASER *Plus* Garnet

main menu

section menu

100313-050-T-M **PASER *Plus* garnet, 50 mesh**

Packaged in forty 55 lbs (25 kg) bags totaling 1 metric ton (2204 lbs). All forty bags are shipped within a single Supersack to protect the garnet from damage and make it easy to move and store.

100313-050-T-M-S **PASER *Plus* garnet, 50 mesh in a Supersack**

Packaged in a 1 metric ton (2204 lbs) Supersack.

55 lb Bags

100313-080-T-M **PASER *Plus* garnet, 80 mesh**

Packaged in forty 55 lbs (25 kg) bags totaling 1 metric ton (2204 lbs). All forty bags are shipped within a single Supersack to protect the garnet from damage and make it easy to move and store.

100313-080-T-M-S **PASER *Plus* garnet, 80 mesh in a Supersack**

Packaged in a 1 metric ton (2204 lbs) Supersack.

1 metric ton Supersack

100313-120-T-M **PASER *Plus* garnet, 120 mesh**

Packaged in forty 55 lbs (25 kg) bags totaling 1 metric ton (2204 lbs). All forty bags are shipped within a single Supersack to protect the garnet from damage and make it easy to move and store.

100313-120-T-M-S **PASER *Plus* garnet, 120 mesh in a Supersack**

Packaged in a 1 metric ton (2204 lbs) Supersack.

more

Garnet Filter Screens

main menu section menu

★014039-1 Garnet filter screen for 500 lb hopper

★014040-1 Garnet filter screen for 2200 lb hopper

55 lb Bags

1 metric ton
Supersack

Lubricant

A-2185 Blue lubricant

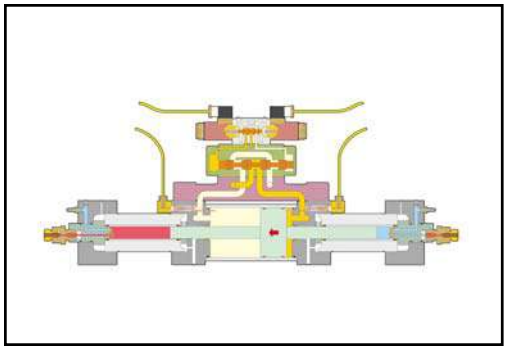
Blue grease for protecting all high-pressure threads and connections. Each tube is 50 ml.

A-4689 O-ring lube

White grease for all high-pressure seals and O-rings, food grade. Each tube is 10 ml.

200006 Parker Super O-Lube

Grease for all O-rings of hydraulic parts, silicone base. Each tube is 50 ml.



The technology

In order to ensure maximum service life of all high-pressure and hydraulic parts please use only grease recommended by FLOW.

Adhesive

★A-3202

Loctite 243

Adhesive for medium-tight securing of screws on the check valve. One bottle contains 50 ml.

★A-6005

Loctite 620

Adhesive for tight connection of the mixing chamber on the PASER 3 cutting head. One bottle conains 50 ml.

The technology

In order to ensure best accuracy of fit of cutting head and pump parts please use only adhesives recommended by FLOW.

Section 9
FLOW Trimmline Spares

main menu

Section Menu

Flow

FLOW Trimmline Spares

Orifice Assemblies

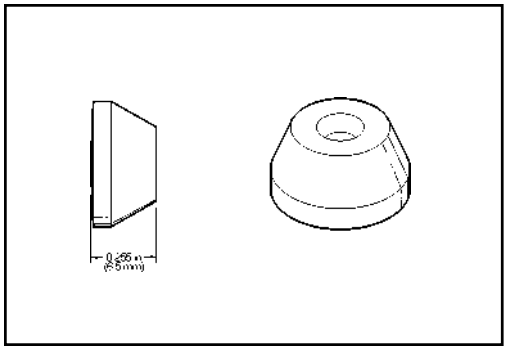
main menu

section menu

012469-X	Orifice assembly, conical
012469-7	internal dia. 0.007 in. (0.178 mm)
012469-8	internal dia. 0.008 in. (0.203 mm)
012469-9	internal dia. 0.009 in. (0.229 mm)
012469-10	internal dia. 0.010 in. (0.254 mm)
012469-11	internal dia. 0.011 in. (0.279 mm)
012469-12	internal dia. 0.012 in. (0.305 mm)
012469-13	internal dia. 0.013 in. (0.330 mm)
012469-14	internal dia. 0.014 in. (0.356 mm)
012469-15	internal dia. 0.015 in. (0.381 mm)
012469-16	internal dia. 0.016 in. (0.406 mm)
012469-18	internal dia. 0.018 in. (0.457 mm)
012469-20	internal dia. 0.020 in. (0.508 mm)

Trimmline version of 009519-X

For more information see Section 10: Water Flow Rate



Specifications

Material: sapphire
Suitable for: cutting head PASER 3 and PASER 3–WMC
Use: generating the waterjet
Note: We chose the name Trimmline because we have trimmed the costs off our premium line by changing materials and reducing manufacturing costs.

more

FLOW Trimmline Spares

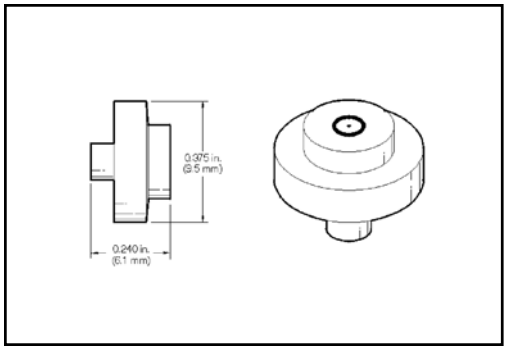
Orifice Assemblies

main menu | section menu

012468-X	Orifice assembly, standard
★012468-5	internal dia. 0.005 in. (0.127 mm)
★012468-7	internal dia. 0.007 in. (0.178 mm)
★012468-9	internal dia. 0.009 in. (0.229 mm)
012468-10	internal dia. 0.010 in. (0.254 mm)
012468-12	internal dia. 0.012 in. (0.305 mm)
012468-13	internal dia. 0.013 in. (0.330 mm)
012468-16	internal dia. 0.016 in. (0.406 mm)
012468-18	internal dia. 0.018 in. (0.457 mm)

Trimmline version of 001821-X

For more information see Section 10: Water Flow Rate



Specifications

Material: sapphire
Suitable for: cutting head PASER II (abrasive) and water-only applications
Use: generating the waterjet
Note: We chose the name Trimmline because we have trimmed the costs off our premium line by changing materials and reducing manufacturing costs.

more

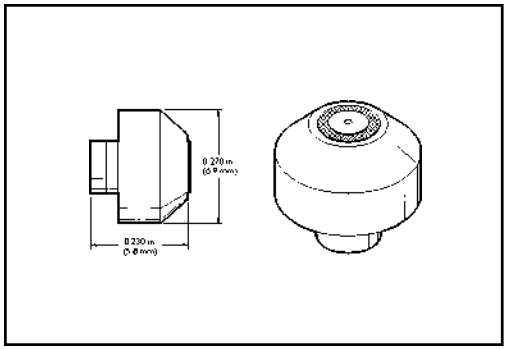
FLOW Trimmline Spares

Orifice Assemblies

main menu | section menu

012483-X	Orifice assembly, standard
★012483-4	internal dia. 0.004 in. (0.102 mm)
★012483-6	internal dia. 0.006 in. (0.152 mm)
★012483-7	internal dia. 0.007 in. (0.178 mm)
★012483-8	internal dia. 0.008 in. (0.203 mm)
★012483-10	internal dia. 0.010 in. (0.254 mm)
★012483-12	internal dia. 0.012 in. (0.305 mm)

Trimmline version of 003788-X



Specifications

Material: sapphire
Suitable for: cutting head PASER II (abrasive) and water-only applications
Use: generating the waterjet
Note: We chose the name Trimmline because we have trimmed the costs off our premium line by changing materials and reducing manufacturing costs.

For more information see Section 10: Water Flow Rate

more

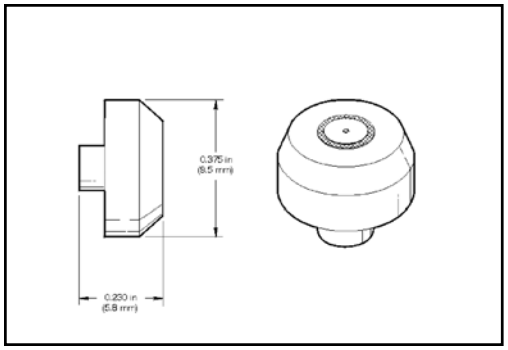
FLOW Trimmline Spares

Orifice Assemblies

main menu | section menu

012484-X	Orifice assembly, conical 60°
★012484-4	internal dia. 0.004 in. (0.102 mm)
★012484-5	internal dia. 0.005 in. (0.127 mm)
★012484-6	internal dia. 0.006 in. (0.152 mm)
★012484-7	internal dia. 0.007 in. (0.178 mm)
★012484-10	internal dia. 0.010 in. (0.254 mm)
★012484-13	internal dia. 0.013 in. (0.330 mm)

Trimmline version of 004519-X



Specifications

Material: sapphire
Suitable for: cutting head PASER II (abrasive) and water-only applications
Use: generating the waterjet
Note: We chose the name Trimmline because we have trimmed the costs off our premium line by changing materials and reducing manufacturing costs.

For more information see Section 10: Water Flow Rate

FLOW Trimmline Spares

Mixing Tubes

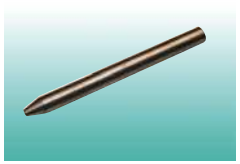
main menu

section menu

012018-XX-XX Mixing tube Qbic 10, standard sizes

012018-30-30	Length 3 in. (76.20 mm), Internal dia. 0.030 in. (0.762 mm)
012018-40-30	Length 3 in. (76.20 mm), Internal dia. 0.040 in. (1.016 mm)

Trimmline version of 010460-XX-XX



012680-XX-XX Mixing tube Qbic 20, standard sizes

012680-30-30	Length 3 in. (76.20 mm), Internal dia. 0.030 in. (0.762 mm)
012680-40-30	Length 3 in. (76.20 mm), Internal dia. 0.040 in. (1.016 mm)

Trimmline version of 010460-XX-XX

Specifications

Suitable for: cutting heads PASER 3, PASER 3 WMC, and PASER II

Use: to mix abrasive and water, generating the focused abrasive waterjet

Note: We chose the name Trimmline because we have trimmed the costs off our premium line by changing materials and reducing manufacturing costs.

FLOW Trimmline Spares

High-Pressure Components and ON/OFF valve repair kit

main menu

section menu

★012439-1 **High-pressure seal kit**

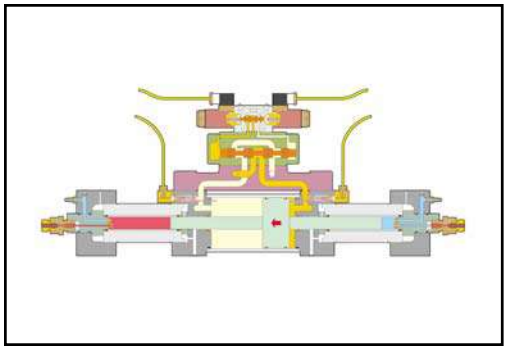
Suitable for intensifier 40K H.O.
Trimmline version of 001197-1

★012440-1 **High-pressure seal kit**

Suitable for intensifier 55K ESL and 55K H.O.
Trimmline version of 001198-1

012465-1 **ON/OFF valve repair kit**

Includes large O-ring, poppet seat, poppet, small O-ring, seal, and back-up ring.
Trimmline version of 001959-1



The Technology

The FLOW ultrahigh-pressure pump is the heart of the waterjet cutting system. At FLOW we have been developing our own pump systems since 1974. Patented FLOW pressure intensifiers and the extra large volume pressure accumulator provide incomparable pressure stability and jet quality. Ceramic piston rods and special sealing materials ensure maximum endurances.

Note: We chose the name Trimmline because we have trimmed the costs off our premium line by changing materials and reducing manufacturing costs.

Section 10

FLOW Product and Technical Information

main menu

Section Menu

Flow

FLOW Benefits: Spare Parts

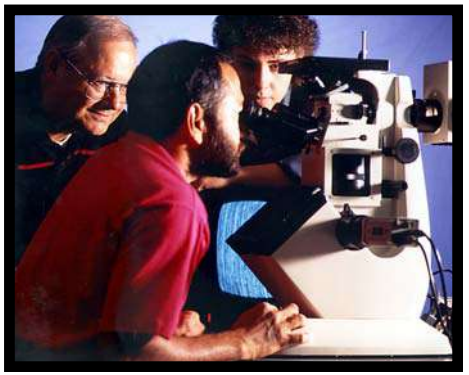
main menu section menu

Trust FLOW Spare Parts for the Best Value

Trust. It's why FLOW has provided more than 5,000 waterjet systems, and the reason FLOW customers trust FLOW Spare Parts to keep their machines operating at peak efficiency and profitability. FLOW customers recognize uptime as the key indicator of their success, and FLOW Spare Parts deliver value by achieving the industry's longest service hours and lowest hourly operating costs. Producing parts and consumables for ultrahigh-pressure equipment is a highly-complex process involving part design and engineering, material specification and selection, precision machining and strict quality control standards and inspection. FLOW controls all facets of the process—R&D, engineering, manufacturing, quality control and inventory—in-house. FLOW Spare Parts prevent any risk of a cascading failure—a chain reaction where one part failure leads to other parts failing downstream, increasing costs and resulting in downtime. In addition to their quality and reliability, FLOW parts are always available. Trust FLOW Spare Parts to give you peace of mind, knowing your machine will stay running and making money.

Designed for Safety First

Before considering functionality and reliability, FLOW designs its components for safety. FLOW incorporates expertise gained through millions of pump operating hours and hundreds of years of accumulated UHP engineering experience into every Spare Part. As a result, FLOW Spare Parts meet the industry's strictest safety standards and protect against downtime. FLOW's R&D staff and engineers design parts using sophisticated Finite Element Analysis (FEA) modeling software, where pressure-cycle fatigue life and structural characteristics can be predicted and analyzed on a computer. FLOW then builds prototypes and conducts destructive testing, running components to their maximum design life in a UHP environment. Destructive testing is the only way to understand how, when and why a UHP part can fail, and how to prevent failures. You can trust FLOW Spare Parts for safety.



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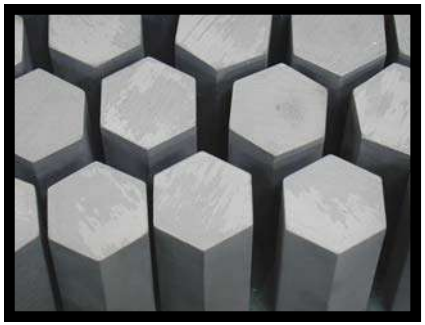
FLOW Benefits: Spare Parts

main menu section menu

FLOW Spares - Always Available

Receiving the spare parts you need, when you need them, is crucial to the success of your operation. FLOW's customer spare parts inventory exceeds $10 million, and includes more than 1,200 "in-stock" parts. FLOW offers same-day QUICKSHIP‰ shipment of any in-stock part for emergency situations. Customer service representatives provide fast and friendly service, and are on-call 24 hours a day to help you in the event of an emergency. FLOW annually invests in new equipment (see automated carousel system pictured at left) that dramatically reduces the time required to process part orders. The end result is that you receive prompt and complete Spare Part deliveries. To reduce purchasing and shipping costs, FLOW offers a blanket order system. Trust FLOW for availability of your replacement parts and consumables.

High-Grade Materials Enhance Component Life



Raw materials vary in composition and characteristics. Even the smallest change in material properties can reduce component life under the stresses of a UHP environment. Proper material specification and selection are critically important. FLOW produces parts from raw materials developed exclusively for FLOW, based on proprietary specifications that meet the highest industry standards for purity, strength and fracture toughness. FLOW also alters the metallurgical characteristics of materials to create properties that enhance resistance to wear and corrosion. Ongoing development of exotic new materials further extends component life and lowers operating costs. FLOW Spares eliminate risk of downtime due to poor material selection.

FLOW's In-House Production Ensures Unmatched Reliability

Part tolerance is critical to machine uptime, as FLOW uses materials elasticity principles in the engineering of its parts. Parts yield and stretch with each compression and decompression. One out-of-tolerance part can lead to unintended loads placed on other components, and consequently a cascading failure. FLOW machines all UHP components in its world-class machine shop, using only high-end machine tools (see $1,250,000 flexible machining center pictured) capable of machining to +.0001 inch and operated by machinists averaging 12 years of CNC experience. FLOW treats parts with a proprietary surface modification process to enhance wear resistance and service life. Trust FLOW to produce components that eliminate unscheduled downtime and set the industry standard for service life.

more

FLOW Benefits: Spare Parts

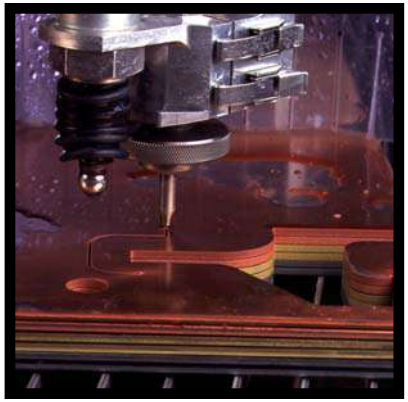
main menu section menu

FLOW Spare Parts - Quality You Trust

FLOW dedicates an entire facility on its factory floor to Quality Control. QC performs design and materials analysis before and after manufacturing, using state-of-the-art measurement equipment. Raw materials are inspected for small inclusions and other structural flaws not visible to the eye. Finished parts are scrutinized for defects that could lead to premature part failure. Part geometries are inspected with a Coordinate Measurement Machine capable of measuring accuracy to +.0001 inch. To inspect surface finishes, FLOW uses a high-tech surface profilometer capable of measuring 3 atoms of nitrogen (about one-ten-thousandth the size of a germ). A part with the FLOW QC seal of approval will keep your equipment running.

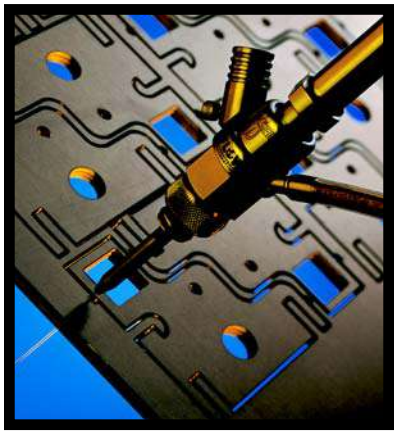
Technology Leadership Keeps You A Step Ahead

FLOW's ongoing commitment to offering affordable technology upgrades and accessories compatible with your existing machine keeps you on the leading edge of waterjet technology. FLOW employs five of the world's top waterjet research scientists with an accumulated 100+ years of experience in high-pressure waterjet technology. Furthermore, FLOW dedicates 8% of its annual revenue to inventing new UHP products, materials and processes that improve productivity and add flexibility and versatility to your existing machine. Many of FLOW's ongoing engineering and design advancements are transparent to you at no extra cost. Other revolutionary products, such as the ESL Intensifier Upgrade Kit, Ceramic Plunger, External Compensation Valve and Hornet Nozzle represent significant technology enhancements available at a nominal cost. Trust FLOW to keep you on the leading edge of waterjet technology.



FLOW Benefits: PASER® 3 Cutting Head

main menu section menu



The Complete Abrasivejet System

The PASER, 3 is PATENTED FLOW technology that clearly demonstrates leadership in the science of abrasive waterjet. This system is an engineering work of art, winning the award from Metalworking Digest as one of the "Top 25 New Products of the Year". It is used by the most experienced waterjet users, and has become the largest selling abrasivejet system in the world. The system includes a precision pre-aligned cutting head, simplified abrasive metering system, peak performance display monitor, abrasive bulk transfer storage system, a pierce shield with brush, and a DeHazer to minimize noise and overspray — all as standard equipment. PASER 3 evolved from more than three years of market research, concurrent engineering, and customer testing. What developed is an abrasivejet that cuts 30-50% faster than previous versions, yet simplified the process for error-free operation. Each component of the system complements the other, working cohesively to operate at peak efficiency, cutting faster and at the lowest cost per inch. Built to withstand the rigors of a manufacturing environment, the PASER 3 delivers years of trouble-free service with minimal maintenance.

Performance Monitor

The Paser 3 includes a PATENTED performance monitor that displays all facets of the abrasivejet process. Any deviation from peak efficiency is immediately shown to the operator. Previously, operators had to be well trained to listen for audible changes reflecting changing jet conditions. Now, operators simply glance at the large analog monitor located at the front of the machine to view cutting conditions. The analog monitor instills confidence in the operator, as guesswork concerning abrasive flow and orifice/nozzle wear is completely eliminated. This monitor is particularly of value in multiple head operations, as the independent displays ensure that all cutting heads are performing at optimum. This, Flow developed exclusive feature is not available on any competitive system.

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FLOW Benefits: PASER® 3 Cutting Head

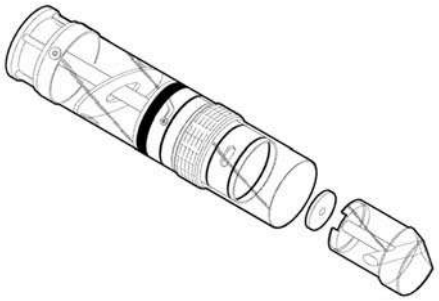
main menu section menu

Cutting Head

The PATENTED Paser 3 cutting head consists of only five components, compared to 10-20 individual parts with other cutting heads. Operation is dramatically simplified, yet functionality has greatly improved. Only two wear parts exist, the exclusive Ruby orifice and Qbic 30 Plus mixing tube. Each of these deliver an unmatched 150 hours of life — extending uptime and reducing operating cost. The mixing tube and orifice are automatically aligned to minimize setup time, requiring no special tools. The Paser 3 offers the only abrasivejet head in the world not requiring an expensive tungsten carbide replaceable insert. The elimination of this costly consumable is proof of the Paser 3's advanced design - the body does not wear out. The Paser 3 system includes a pierce shield with an integral brush attachment that surrounds the nozzle to contain spray from piercing operations, and a patented DeHazer water curtain to reduce surface frosting on polished materials.

Abrasive Bulk Transfer Hopper

The PASER 3 Bulk Storage System holds approximately 500 lbs. of abrasive in a sealed dry environment for hours of uninterrupted cutting. Sensors and signal lights tied directly into FlowMaster notify the operator of low abrasive and a shut down occurs should the hopper run out. Other standard features include a built in bag breaker, a trash screen, and a lightweight lid. The 41 inch height provides for easy loading.



Abrasive Metering System

As the inventor of the abrasivejet process, we realize that the most expensive single consumable item is the garnet. The PATENTED Paser 3 metering system feeds abrasive into the cutting head with unmatched precision. The waterproof metering hopper is located next to the cutting head, enhancing abrasive flow reliability, and increasing the amount of abrasive that can be efficiently entrained in the jet stream. The result is faster and smoother cutting, at the lowest operating cost. The operator can view into the mini-hopper for troubleshooting and inspection, and can even hose down the mini-hopper during clean up. Complete disassembly is accomplished in seconds with one hand - no tools are required. The Paser 3 system relies on gravity to ensure consistent abrasive flow, compared to other systems that use less reliable vibration or venturi. These inconsistent feed systems cannot set or maintain accurate metering of the abrasive. FLOW's simple metering disk design ensures you continuously operate at peak performance, constantly using the ideal amount of abrasive.

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FLOW Benefits: PASER® 3 Cutting Head

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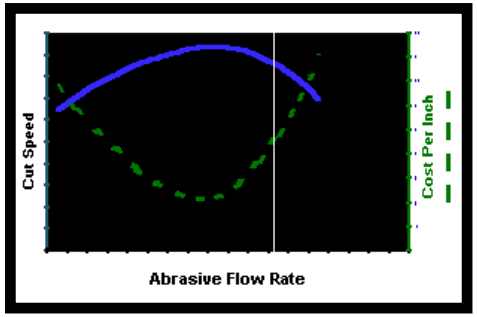

Peak Performance

The Paser 3 is designed to guarantee you cut as fast as possible at the lowest possible cost per inch — a point defined as Peak Performance. The entire Paser 3 system is designed to ensure you consistently operate at Peak Performance. Too much abrasive can overburden the jet and increase operating costs, while too little abrasive adversely affects productivity. The abrasive constitutes over 70% of the machine operating cost, so precise control by gravity, which never varies, is key. Combine this cost control with the exclusive Ruby orifice, the long-life Qbic 30 Plus Mixing Tube, and the Peak Performance Monitor, and you have a foolproof system that will produce parts faster at lower cost than any other system.

Paser Options

FLOW offers a full array of application-specific PASER 3 options to optimize your cutting operations. These include: 1) FLOW's PATENTED Vacuum Assist (see photo) pierces brittle materials such as marble, granite, glass and composites without breakage. The vacuum pulls abrasive into the body before the waterjet starts, ensuring abrasive particles are entrained in the jet stream immediately; 2) The PASER 3 Electronic Performance Monitor is an electronic version of the Paser 3's analog gauge that automatically shuts the machine down should a deviation in the cutting process occur; 3) For very large production runs, FLOW offers a 2000 lb. abrasive bulk transfer hopper as well as larger abrasive material storage silos.

Dynamic Waterjet™ Technology

main menu section menu

Dynamic Waterjet with Active Tolerance Control™ technology produces more accurate parts at significantly higher cutting speeds than parts cut with conventional waterjet. This patent pending system utilizes a newly-developed advanced motion system that incorporates mathematical cutting models. These models are seamlessly integrated into FlowMaster®, FLOW's intelligent PC-based waterjet control system, so that operating Dynamic Waterjet is extremely simple. All that is required is a few mouse clicks to enter the type of material being cut, its thickness, and the desired cut quality. The software does the rest. FlowMaster dynamically controls the position of the cutting head so that parts are cut to high precision without taper. In addition the software "thinks ahead" as parts are cut, calculating the optimal cut path to produce perfect part geometry, even in very thick materials. Dynamic Waterjet optimizes waterjet cutting by operating at the highest possible speeds, with the best part precision, to achieve the lowest cost per part.

Inlet Water Quality

Inlet water quality

Water quality plays a crucial role in determining how well your ultrahigh-pressure waterjet system operates. Adhering to FLOW's recommended specifications for water quality ensures that your ultrahigh-pressure pumps* and components give you optimum performance.

There are two requirements for water in your ultrahigh-pressure pump system: the primary water used for the jet and the water for cooling.

Primary water requirements

Water Source

FLOW recommends using a municipal tap water supply source, or equivalent, for the primary water to the pump (Filtered Water In). Process water, boiler condensate, or untreated water sources are generally not acceptable. Water treated by reverse osmosis (RO) or deionization (DI) should not be used without consulting FLOW.

Water Hardness

The primary water should have a hardness level of 17 ppm or less. Typically this will require a water softener. Only a sodium ion exchange water softening system should be used. The water softening system should be sized for a capacity that is at least 1.5 times the maximum flow rate for your high pressure pump (see chart at the end of this topic). Additionally, you should be aware that most water utilities change the source of the water supply seasonally, causing the water hardness at your facility to change significantly. It is important to select a softener of sufficient capacity to handle the highest hardness levels expected.

As ion exchange water softening systems require regular regeneration, the system you select needs to accommodate your longest duty cycles. Normally, a dual system is recommended as this can provide a continuous supply of treated water by alternating between media tanks. Water softening systems are available from your local water treatment company.

pH

A pH value between 6.5 and 9.5 is required.

* Models 5X, 7X, 9XV, 20X, 25X, COUGAR, and HUSKY™ E-150

Inlet Water Quality

Iron (Fe) Content

The dissolved iron content of the water should be less than 0.1 ppm. A standard sodium ion exchange water softener will normally remove some iron along with water hardness. If iron levels are unusually high, your water treatment supplier can supply a water softener option that will enhance its iron removal capabilities.

Silica

If silica levels in the water exceed 15 ppm, you may need to consider ultra-filtration. Please consult with Flow Technical Services if silica levels are excessive.

Pressure

The following pressures must be maintained during operation:

5X, 7XS, COUGAR.....25–100 psi [1.8–7 bar]
All other pumps.....10–100 psi [0.7–7 bar]

Temperature

The temperature range should be between 35 and 80 degrees F [2 and 26 degrees C].

Plumbing

All plumbing connections between the pump and the primary water source or water softener should be made with 1/2 inch or larger Schedule 80 PVC. Do not use iron pipe or fittings.

Suspended Particulate Filtration

The primary water must be filtered for suspended particulate matter. All FLOW ultrahigh-pressure pumps include filters for this purpose. Replacement of the filter cartridges as specified in the maintenance manuals is all that is necessary. The filters used in FLOW pumps are extremely high grade filters with absolute ratings. Do not substitute with other filters.

more

Inlet Water Quality

Coolant Water Requirements

Cooling water can be provided from a standard water source, such as tap water, or from a closed loop cooler/chiller system.

With a tap water source, water is connected to the ultrahigh-pressure pump (Cooling Water In) where it is internally routed through heat exchangers or other cooling circuits. After cooling the pump, the warm water is routed out of the pump (Cooling Water Out), typically to a drain. The water supply should be sized for at least 3 gpm [12 lpm] per 50 horsepower at 60 degrees F, and maintained at a temperature between 35 and 80 degrees F [2 and 26 degrees C].

With a closed loop cooler/chiller system, the water that passes through the pump for cooling is recirculated to a water cooling or chilling system to remove the waste heat before being routed back to the pump.

FLOW recommends that a flow meter be installed in the plumbing that exits the high pressure pump to monitor flow.

No special water treatment is required for cooling water.

Primary Water Flow Rates (Does not include cooling water requirements)

Pump	GPM [LPM] @ 30,000 psi	GPM [LPM] @ 40,000 psi	GPM [LPM] @ 55,000 psi
5X	1.15 [4.35]	.84 [3.18]	.51 [1.93]
7XS	1.36 [5.15]	1.00 [3.79]	.61 [2.31]
7XD	2.76 [10.45]	2.01 [7.61]	1.24 [4.69]
9XVS	1.84 [6.97]	1.34 [5.07]	.82 [3.10]
9XVD	2.76 [10.45]	2.01 [7.61]	1.24 [4.69]
20XS	Not available	1.57 [5.94]	1.00 [3.97]
20XD	Not available	3.14 [11.88]	2.00 [7.57]
25X	Not available	6.00 [22.00]	3.60 [13.00]
HUSKY™ E-150	Not available	5.60 [21.17]	Not available
COUGAR	Not available	.42 [1.59]	Not available

Technical Assistance

If you need additional assistance or have any questions concerning water quality, call FLOW's Technical Service Department at (253)813-3318.

Water Flow Rate

as a function of pressure and orifice size (gpm/lpm)

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Pressure (PSI / BAR)	Orifice size (in./mm)																			
	.003 .076	.004 .100	.005 .127	.006 .152	.007 .178	.008 .203	.009 .229	.010 .254	.011 .279	.012 .305	.013 .330	.014 .356	.015 .381	.016 .406	.017 .432	.018 .457	.019 .483	.020 .508	.021 .533	.022 .559	.023 .584
20,000 1379	.026 .098	.047 .18	.074 .28	.106 .40	.145 .55	.189 .71	.239 .90	.295 1.12	.357 1.351	.425 1.608	.499 1.888	.578 2.187	.664 2.51	.755 2.86	.853 3.23	.956 3.62	1.065 4.03	1.180 4.47	1.301 4.92	1.428 5.40	1.561 5.91
25,000 1724	.029 .110	.053 .20	.082 .31	.119 .45	.162 .61	.211 .80	.267 1.01	.330 1.25	.399 1.51	.475 1.80	.557 2.11	.646 2.44	.742 2.81	.844 3.19	.953 3.61	1.069 4.05	1.191 4.51	1.319 4.99	1.455 5.51	1.596 6.04	1.745 6.60
30,000 2069	.032 .121	.058 .22	.090 .34	.130 .49	.177 .67	.231 .87	.293 1.11	.361 1.36	.437 1.65	.520 1.97	.611 2.31	.708 2.68	.813 3.08	.925 3.50	1.044 3.95	1.171 4.43	1.304 4.94	1.445 5.47	1.573 5.95	1.749 6.62	1.911 7.23
35,000 2414	.035 .132	.062 .23	.098 .37	.140 .59	.191 .72	.250 .95	.316 1.20	.390 1.48	.472 1.79	.562 2.13	.660 2.50	.765 2.90	.878 3.32	.999 3.78	1.128 4.27	1.264 4.78	1.409 5.33	1.561 5.91	1.721 6.51	1.889 7.15	2.064 7.81
40,000 2759	.037 .140	.067 .25	.104 .39	.150 .57	.204 .77	.267 1.01	.338 1.28	.417 1.58	.505 1.91	.601 2.27	.705 2.67	.818 3.10	.939 3.55	1.068 4.04	1.206 4.56	1.352 5.12	1.506 5.70	1.669 6.32	1.840 6.96	2.019 7.64	2.207 8.35
45,000 3103	.039 .148	.071 .27	.111 .42	.159 .60	.217 .82	.283 1.07	.358 1.35	.443 1.68	.535 2.02	.637 2.41	.748 2.83	.867 3.28	.996 3.77	1.133 4.29	1.279 4.84	1.434 5.43	1.597 6.04	1.770 6.70	1.951 7.38	2.142 8.11	2.341 8.86
50,000 3448	.042 .159	.075 .28	.117 .44	.168 .63	.229 .87	.299 1.13	.378 1.43	.466 1.76	.564 2.13	.672 2.54	.788 2.98	.914 3.46	1.049 3.97	1.194 4.52	1.348 5.10	1.511 5.72	1.684 6.37	1.866 7.06	2.057 7.79	2.258 8.55	2.467 9.34
55,000 3793	.044 .167	.078 .295	.122 .46	.176 .67	.240 .91	.313 1.18	.396 1.49	.489 1.85	.592 2.24	.704 2.66	.827 3.13	.959 3.63	1.101 4.17	1.252 4.74	1.414 5.35	1.585 5.99	1.766 6.68	1.957 7.41	2.157 8.16	2.368 8.96	2.588 9.80
60,000 4138	.046 .174	.082 .310	.128 .484	.184 .696	.250 .946	.327 1.237	.414 1.567	.511 1.934	.618 2.339	.734 2.778	.864 3.270	1.002 3.792	1.149 4.348	1.308 4.950	1.476 5.586	1.655 6.263	1.845 6.982	2.044 7.735	2.253 8.526	2.473 9.359	2.703 10.229

Abrasive Flow Rate

Recommended abrasive flow rates at different pressures (lbs/min)

orifice/nozzle combination	Pressure		
	40,000 psi	50-55,000 psi	60,000 psi
7/20	0.3	0.4	N/A
10/30	0.6	0.8	0.9
13/40	1.0	1.2	1.3
14/40	1.1	1.3	1.4
16/40	1.2	1.5	1.5
18/50	N/A	2.4	2.4

Abrasive flow rates for Paser *Plus* Garnet (lbs/min)

metering disk size	Flow Rate		
	120 mesh	80 mesh	50 mesh
0.154	0.4	0.4	0.3
0.168	0.5	0.5	0.4
0.184	0.6	0.6	0.5
0.196	0.7	0.7	0.6
0.206	0.8	0.8	0.7
0.215	0.9	0.9	0.8
0.222	1.0	1.0	0.9
0.229	1.1	1.1	1.0
0.237	1.2	1.2	1.15
0.246	1.3	1.3	1.3
0.255	1.4	1.4	1.4
0.263	1.5	1.5	1.5
0.269	1.6	1.6	1.6
0.275	1.7	1.7	1.7
0.281	1.8	1.8	1.8
0.288	1.9	1.9	1.9
0.295	2.0	2.0	2.0
0.302	2.1	2.1	2.1

PASER® 3 Cutting Speeds

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	orifice/mixing tube size: water flow rate: abrasive flow rate: pump horsepower:	.010/.030 0.5 gpm 0.8 lb/min 25	.014/.040 0.96 gpm 1.3 lb/min 50	.018/.050 1.6 gpm 2.4 lb/min 100	.010/.030 0.51 gpm 0.9 lb/min 25	.014/.040 1.0 gpm 1.4 lb/min 50	.018/.050 1.66 gpm 2.4 lb/min 100
aluminum (6061)	1/4 in.	46.0	67.1	89.6	53.6	76.1	100.3
	1/2 in.	21.8	31.8	42.4	25.4	36.0	47.5
	1 in.	9.7	14.1	18.9	11.3	16.0	21.1
granite (generic)	1/4 in.	81.2	118.4	158.1	94.6	134.1	177.7
	1/2 in.	38.5	56.1	74.9	44.8	63.5	84.1
	1 in.	17.1	24.9	33.3	19.9	28.2	37.4
graphite/epoxy	1/4 in.	125.0	182.2	243.4	145.6	206.5	272.4
	1/2 in.	59.2	86.3	115.3	69.0	97.8	129.0
	1 in.	26.3	38.4	51.2	30.6	43.5	57.3
Inconel	1/4 in.	15.5	22.7	30.2	18.1	25.7	33.9
	1/2 in.	7.4	10.7	14.3	8.6	12.1	16.0
	1 in.	3.3	4.8	6.4	3.8	5.4	7.1
marble (generic)	1/4 in.	95.7	139.5	186.2	111.5	158.0	208.5
	1/2 in.	45.3	66.1	88.2	52.8	74.9	98.7
	1 in.	20.1	29.4	39.2	23.5	33.3	43.9
glass	1/4 in.	88.3	128.8	172.0	102.9	145.9	192.5
	1/2 in.	41.8	61.0	81.5	48.7	69.1	92.0
	1 in.	18.6	27.1	36.2	21.7	30.7	40.5
steel (mild)	1/4 in.	18.3	26.6	35.6	21.3	30.2	39.8
	1/2 in.	8.7	12.2	16.8	10.1	14.3	18.9
	1 in.	3.8	5.6	7.5	4.5	6.3	8.4
steel (stainless)	1/4 in.	17.0	24.8	33.2	19.8	28.1	37.7
	1/2 in.	8.1	11.8	15.7	9.4	13.3	17.9
	1 in.	3.6	5.2	7.0	4.2	5.9	7.9
titanium	1/4 in.	22.2	32.3	43.1	25.8	36.6	48.3
	1/2 in.	10.5	15.3	20.4	12.2	17.3	22.9
	1 in.	4.7	6.8	9.1	5.4	7.7	10.2