

PERMASWAGE

World Leader in Aerospace Fluid Fittings & Tooling



PERMASWAGE

Permaswage
Acquired by PCC

2014



Consolidated Under
PCC Fluid Fittings

2013



Nelson Aerospace
Acquired by
Permaswage

2011



Faber
Acquired by PCC

2010



HK Fittings
Acquired by
Permaswage

2008



Airdrome
Acquired by PCC

1938



Company Founded as
Deutsch Metal Connectors

PERMASWAGE® (RADIAL) FITTINGS

Permaswage® is an innovative external swaging method that connects metallic tubing for a leak-free seal. Our product offers ease of installment on commercial, military and corporate aircraft.

Designed and qualified in 1972

Qualified in accordance with SAE AS4459, AS18280 & AS85421 and various OEM specifications. The fittings have a global service history.

Customizations

Fittings are available in unlimited configurations; permanents, separables and reducers in various sizes.

PERMANENT TO PERMANENT

Shapes: Straight, Elbow (45° & 90°), Tee, and Cross

Sizes: 3/16" to 1-1/2" OD (03-24)

Materials: Aluminum, Stainless Steel, Titanium

Pressures: Up to 4,000 psi



FLARELESS TO PERMANENT

Shapes: Straight, Elbow (45° & 90°), Tee, and Cross

Sizes: 3/16" to 1-1/2" OD (03-24)

Materials: Aluminum, Stainless Steel, Titanium

Pressures: Up to 4,000 psi



FLARED TO PERMANENT

Shapes: Straight, Elbow (45° & 90°), Tee, and Cross

Sizes: 3/16" to 1-1/2" OD (03-24)

Materials: Aluminum, Steel, Titanium

Pressures: Up to 4,000 psi



BEAM SEAL TO PERMANENT

Shapes: Straight, Elbow (45° & 90°), Tee, and Cross

Sizes: 3/16" to 1-1/2" OD (03-24)

Materials: Steel, Titanium

Pressures: Up to 3,000 psi



(310) 323-6200 PERMASWAGESALES@PCCAIRFRAME.COM 14800 SOUTH FIGUEROA STREET GARDENA, CA 90248

PERMALITE® (AXIAL) FITTINGS

Permalite® is an axial-externally swaged, leak-free, metal to metal fitting system combining swage rings and lower weight composite advantages designed for fluid systems up to 5000 psi. Accommodates temperatures from -65°F to 275°F. The fittings exceed both the burst and impulse capabilities of Aerospace tubing. They also exceed 4x the operating pressure of qualified systems while maintaining superior connectivity. Compact user friendly installation tools operate in either pull or push mode, only requiring 180 degree access.

Designed and qualified in 1992

Customizations

Fittings are available in unlimited configurations; permanents, separables and reducers in various sizes.

PERMANENT TO PERMANENT

Shapes: Straight, Elbow (45° & 90°), Tee, and Cross

Sizes: 3/16" to 2" OD (03-32)

Materials: Aluminum, Stainless Steel, Titanium

Pressures: Up to 5,000 psi



FLARELESS TO PERMANENT

Shapes: Straight, Elbow (45° & 90°), Tee, and Cross

Sizes: 3/16" to 2" OD (03-32)

Materials: Aluminum, Stainless Steel, Titanium

Pressures: Up to 5,000 psi



FLARED TO PERMANENT

Shapes: Straight, Elbow (45° & 90°), Tee, and Cross

Sizes: 3/16" to 2" OD (03-32)

Materials: Aluminum, Stainless Steel, Titanium

Pressures: Up to 5,000 psi



BEAM SEAL TO PERMANENT

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Sizes: 3/16" to 2" OD (03-32)

Materials: Stainless Steel, Titanium

Pressures: Up to 5,000 psi



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MINIATURE END (DME) FITTINGS

DME revolutionizes the industry with a simple to use, durable and cost effective end fitting system, offering several advantages, including; it is the lightest and shortest length available on the market. The installation process is highly repeatable, with consistent dimensional results.

There is one fitting design for all tubes and wall thicknesses.

There is no need for X-ray, special cryogenic storage, or internal gaging before or after installation.

FITTINGS

Sizes: 3/16" to 1-1/2" OD (03-24)

Materials: Stainless Steel

Pressures: Up to 5080 psi

Industry Standard: AS1792 & MS91921

Interchangeable: MS21922 and NAS1760 (AS5181) compatible with MS33514 and MS33515 male flareless fittings.

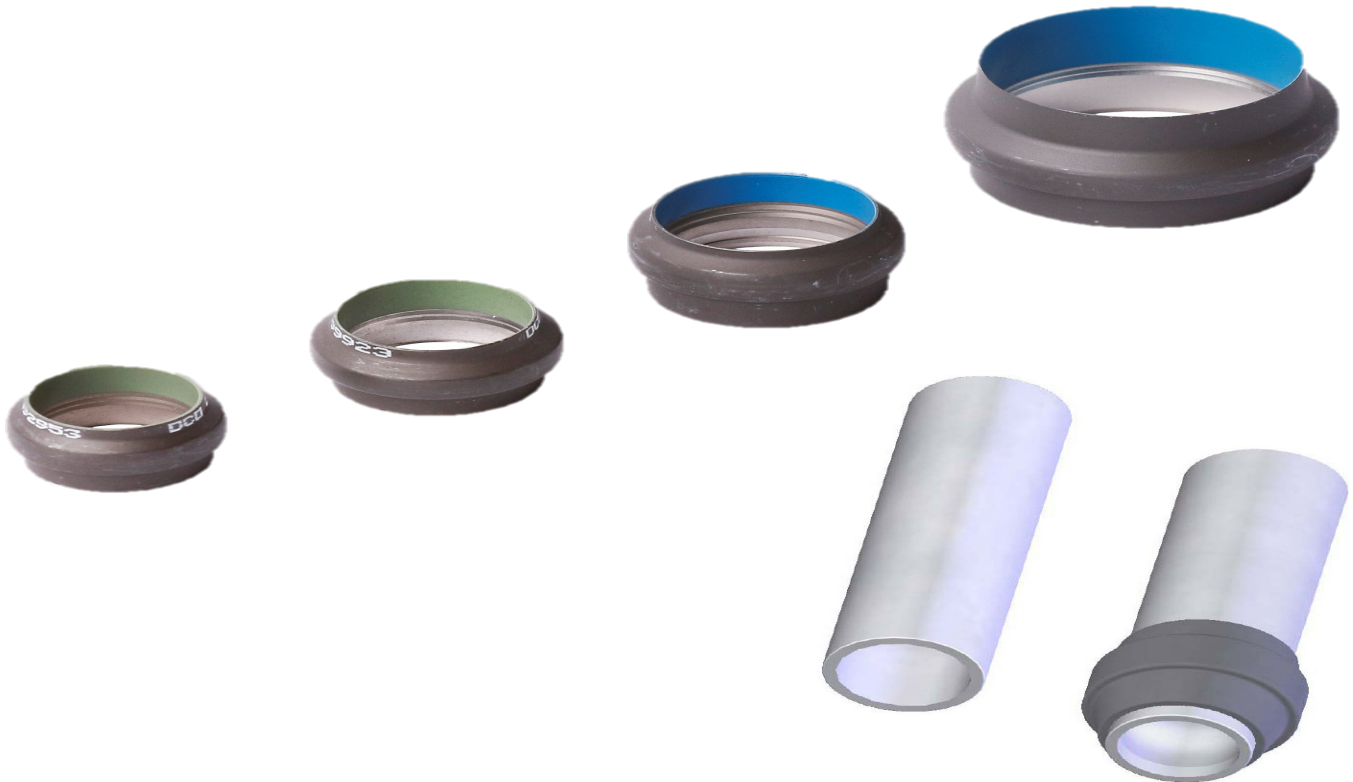
TUBING

DME 30 Series

- 21-6-9 Stainless Steel tube: Up to 4000 psi
- Aluminum tube: Up to 1500 psi
- Titanium tube: Up to 5080 psi

DME 40 Series

- Titanium tube: Up to 4000 psi



STANDARD FITTINGS

SAE and military standard fittings have reduced body envelopes which can offer lower weight, repeatability, and ease of installment. Self aligning features protect fittings from over-torquing.

Customizations

Fittings are available in unlimited configurations; permanents, separables and reducers in various sizes.

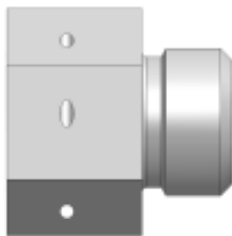
BOSS

Shapes: Straight, Elbow (45° & 90°), Tee, and Cross

Sizes: 1/8" to 2" OD (02-32)

Materials: Aluminum, Stainless Steel, Titanium

Pressures: Up to 3,000 psi



FLARELESS

Shapes: Straight, Elbow (45° & 90°), Tee, and Cross

Sizes: 3/16" to 2" OD (03-32)

Materials: Aluminum, Stainless Steel, Titanium

Pressures: Up to 5,080 psi



FLARED

Shapes: Straight, Elbow (45° & 90°), Tee, and Cross

Sizes: 1/8" to 2" OD (02-32)

Materials: Aluminum, Stainless Steel, Titanium

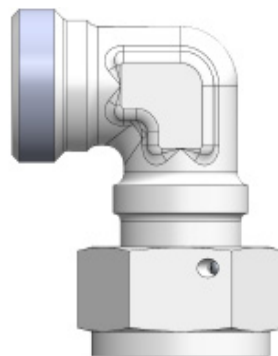


BEAM SEAL

Shapes: Straight, Elbow (45° & 90°), Tee, and Cross

Sizes: 3/16" to 1-1/2" OD (03-24)

Materials: Aluminum, Stainless Steel, Titanium



AEROSPACE STANDARDS: AXIALLY SWAGED

AS Titanium axially swaged fittings qualified per AS5958

PERMANENT TO PERMANENT

Shapes: Straight, Elbow, Tee
Sizes: 1/4" to 1-1/4" OD (04-20)
Materials: Titanium
Pressures: Up to 5,080 psi



BEAM SEAL TO PERMANENT (DAS)

Shapes: Straight, Elbow, Tee
Sizes: 1/4" to 1" OD (04-16)
Materials: Titanium
Pressures: Up to 5,080 psi

FLARELESS TO PERMANENT

Shapes: Straight, Elbow, Tee
Sizes: 1/4" to 1-1/4" OD (03-32)
Materials: Titanium
Pressures: Up to 5,080 psi



AS Aluminum axially swaged fittings qualified per AS6116

PERMANENT TO PERMANENT

Shapes: Straight, Elbow (45° & 90°), Tee, and Cross
Sizes: 3/16" to 2" OD (03-32)
Materials: Aluminum
Pressures: Up to 1,500 psi

FLARELESS TO PERMANENT

Shapes: Straight, Elbow, Tee
Sizes: 1/4" to 1-1/4" OD (04-20)
Materials: Aluminum
Pressures: Up to 1,500 psi



PERMASWAGE® RADIAL (DLT) TOOLING

These high compression, lightweight, portable, DLT swaging tools are used in concert with Permaswage® Radial fittings to join aircraft hydraulics, fuel, pneumatic, and metallic tube systems to form a complete, reliable, leak-free fitting joint.

Design was developed through extensive use of finite element analysis, enabling Permaswage® engineers to reduce maintenance, size and weight while extending service life. The features incorporated into DLT series tools reduce tube system production time by over 50%. Metallic tube joints assembled with Permaswage® fittings and tooling are guaranteed for the life of the tube.

DLT TOOLING

Designed and qualified in 1972

- Lightweight and portable
- Manufactured using “super alloy” materials.
- Ideal for production and in-situ field repair
- Compact for use in tight areas
- Supports tube sizes 3/16”-1 1/2” (OD 03-24)



DLT (SECOND GENERATION) TOOLING

Design and qualified in 2011

Inclusive of new design features

- DLT2 Safety Features:

- Head Assembly

- Yoke die end plate screws replaced with Dowel pins to decrease stress risers
- Protective shroud encapsulates yoke components as a safety guard

- Power Unit

- Enhanced load distribution
- Internal stop prevents the springs from collapsing
- Bottom cap uses a retaining ring

-DLT Enhancements

- Improved durability
- Increased reliability
- Quicker operation
- Lower dye block quick fit die retainer

FIELD REPAIR KIT

Sizes: 1/4”- 1 1/2” OD (04-20)

Offers all the tools and accessories required to repair aircraft tubing lines in one kit, including the pump.



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PERMALITE® AXIAL (DAT) TOOLING

Permalite® DAT tooling performs in either push or pull mode. Designed for specific axial swage fittings, allowing for 180 degree access. DAT tooling is manufactured from forgings in order to reduce the weight and tooling envelope dimensions ease of access in aircraft applications.

Sizes: 3/16" to 1-1/2" OD (03-24)

Tool Kits Include: Tube cutting tools, deburring tools, inspection and marking gages, hand pump and hose.

Axial Standard Permalite

Aluminum 1,500 PSI (DAT06AETA1000 series, Green Band)

Titanium/CRES 3,000 to 4,000 PSI (DAT06AE-TA4000 series, Black Band)

Titanium 5,000 PSI (DAT06AETA5000 series, Blue Band)



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MINIATURE END (DET) TOOLING

Miniature End Fitting (DME) tooling offers several advantages, including the shortest length and lightest tooling weight available on the Aerospace market today. The installation process is repeatable, reliable, and extremely simple. The tool is multi-functional and can be used hand-held or bench mounted.

DME 40 Series: Titanium tube up to 4,000 PSI

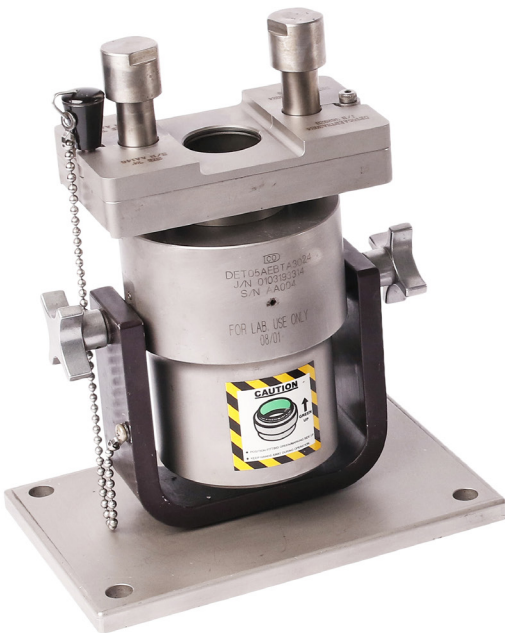
DME 30 Series: Stainless Steel tube up to 3,000 PSI, Aluminum tube up to 1,500 PSI,
Titanium tube up to 4,000 PSI

Tool Kits for DME 40 Series:

DET02AEKT4001 for sizes 04, 06 and 08
DET02AEKT4002 for sizes 10, 12, 14 and 16
DET02AEKT4003 for sizes 20 and 24

Tool Kits for DME 30 Series:

DET03AEKT3001 for sizes 04, 06 and 08
DET03AEKT3002 for sizes 10, 12, 14 and 16



Features:

- Available for tube sizes 3/16" to 1-1/2" OD (03-24)
- Supports multiple tube wall thicknesses and materials
- Bench mounted tools are available in 3 sizes to cover all tube sizes
- Tools are inexpensive compared to welding machines or internal swaging machines

AS TITANIUM 5080 PSI SERIES(AXIAL) DAT TOOLING

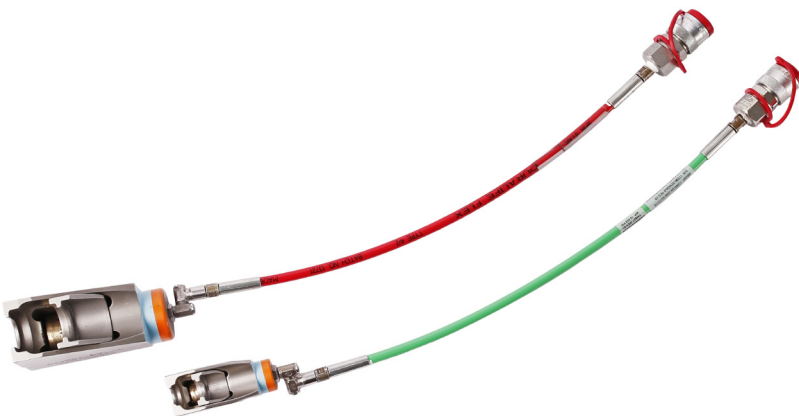
Permalite® DAT tooling performs in either push or pull mode. Designed for specific axial swage fittings, allowing for 180 degree access. DAT tooling is manufactured from forgings in order to reduce the weight and tooling envelope dimensions ease of access in aircraft applications.

Sizes: 3/16" to 1-1/2" OD (03-24)

Tool Kits Include: Tube cutting tools, deburring tools, inspection and marking gages, hand pump and hose.

Axial Standard Permalite

AS Titanium 5,080 PSI (DAT08AETA5000 series);
Blue, Silver, Orange Band



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HYDRAULIC PUMP KITS

All featured hydraulic pump kits support all Permaswage® tooling and fitting systems.

Pneumatic Air-Source Pump Kit
10,000 PSI; DLT02MAPP1000



Battery Operated Pump Kit
10,000 PSI; DLT06MAPE3000



Manual Pump Kit
10,000 PSI; DLT05MAPM1000



Battery
Operated
Pump



Manual Pump



Hose

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SWIVELS

Permaswage® swivels are for fluid systems that flex, twist and bend.

Over 45 years of experience goes into each swivel, with proven worldwide performance in both military and commercial platforms. Permaswage® swivels are qualified to Mil-J-5513, having been tested beyond the requirements, up to 200,000 impulses and 1 million rotational cycles. With its proprietary two-piece seal design, Permaswage® swivels have unmatched performance of any rotary joint.

PHDA 45HDA LHDA

Sizes: 04-20

OD: 1/4"-1"

Materials: Aluminum, Stainless Steel and Titanium

Pressures: Up to 4,000 PSI



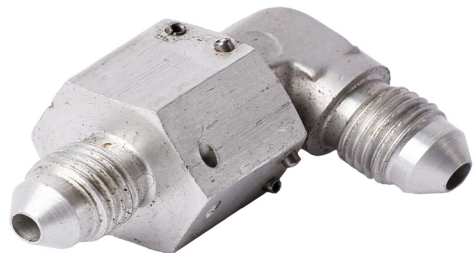
PSA 45SA LSA

Sizes: 04-20

OD: 1/4" to 1-1/4"

Materials: Aluminum, Stainless Steel and Titanium

Pressures: Up to 3,000 PSI



LSM/USM SERIES

Sizes: 04-20

OD: 1/4" to 1-1/4"

Materials: Aluminum, Stainless Steel and Titanium

Pressures: Up to 3,000 PSI



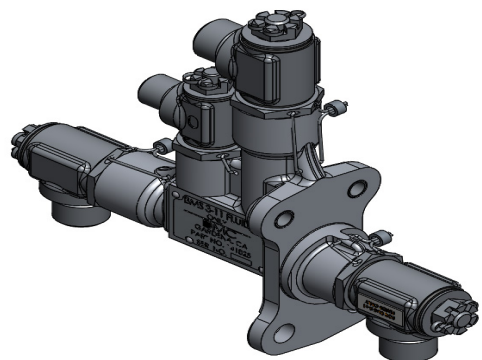
LSP/USP SERIES

Sizes: 04-20

OD: 1/4" to 1-1/4"

Materials: Aluminum, Stainless Steel and Titanium

Pressures: Up to 5,000 PSI



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HOSE FITTINGS AND ASSEMBLIES

HIGH, MEDIUM & LOW PRESSURE ASSEMBLIES

Permaswage® hoses can be used in power plant, air frame, or vacuum systems to carry hydraulic fluids, engine fuels and coolants at temperatures from -65°F to 250°F.

HOSING SPECIFICATIONS:

- Oil & fuel resistant synthetic compound
- Sizes 04, 05, 06, 08, 10 and 12 are double wire braided. Size 16 is triple wire braided
- Single wire & single cotton braid
- Single cotton braid embedded in bonding material.
- Oil & fuel resistant synthetic impregnated cotton braid



FITTING SPECIFICATIONS:

Fittings are available in any material, size, or shape supplied by Permaswage.

- Custom options are available.



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