

SAYWELL INTERNATIONAL

Rynglok

Tube Repair System

The Proven Tube Fitting Performance Standard

The Aeroquip RYNGLOK tube fitting repair system is the system of choice for aerospace hydraulic tubing repair and has been approved by boeing Airbus, major airlines, and all branches of the U.S military.



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A complete line of Aerospace Fittings

Permanent • Separable • Specials



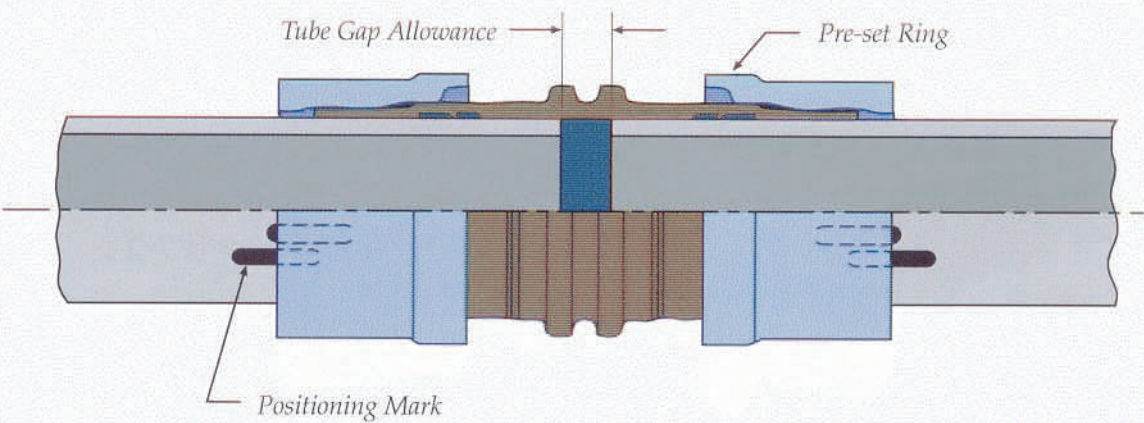
RYNGLOK® Fittings Design Features

- Accommodates all tube wall thicknesses
- Capable of joining any combination of tubing materials
- Accommodates tube float up to .40 inches
- All metal 6Al-4V titanium alloy construction
- Zero leakage with no elastomeric seals
- Accommodates -65 degrees F to +450 degrees F without thermal hysteresis effects
- Fitting joint unaffected by long term exposure to high temperature aerospace fluids
- Exceeds tension strength requirements of Boeing BPS-F-142
- Provides torsion strength comparable to that of aerospace tube
- Exceeds flexure requirements of Mil-F-85421 and Mil-F-85720
- Exceeds burst and impulse capability of aerospace tube
- Passes 15 minute fire test with type IIIb low flow rates and vibration per AS1055B
- Patented design provides excellent high current lightning strike capability
- ★ Approved for repair use by all major commercial aircraft manufacturers
- ★ Approved for repair use by all branches of U.S. Military
NAVAIR 01-1A-8
USAF T.O. 1-1A-8
NAVAIR 01-1A-20
- Wide variety of fitting configurations incorporated into U.S. Government distribution system
- National Stock Number cross-reference list available upon request

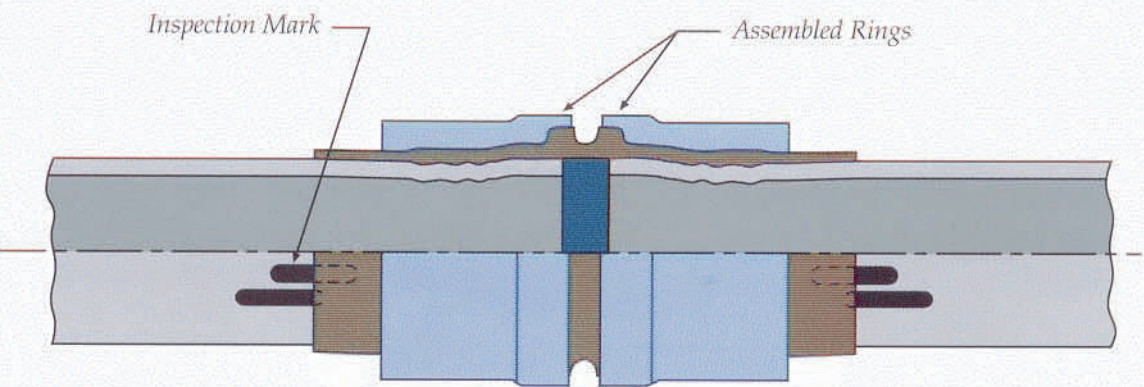
RYNGLOK® Design Features

Simple • Repeatable • Reliable

Before Assembly



After Assembly

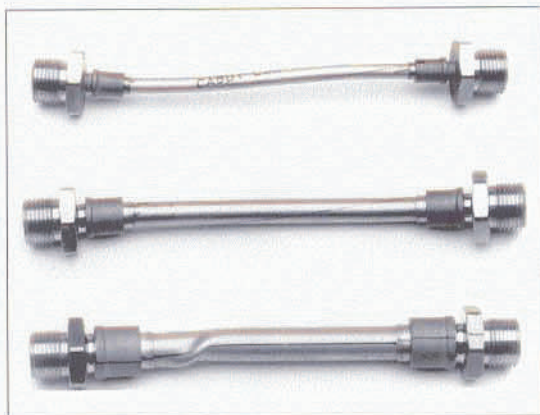


Performance Verification Testing

The superior capability of Rynglok® tube joints has been successfully demonstrated in over 6000 tests for sealing integrity, flexure fatigue, pressure impulse, burst strength, tensile strength, resistance to torsion, fire and lightning strike conductivity.



Even after undergoing torsion, fire, stress corrosion, impulse, flexure, and thermal shock testing, the Rynglok tube joints exceed the burst strength of the tubing.



Rynglok fitting strength often exceeds the torsional strength of the tubing.

Patented Design Feature!

Lightning Strike

spark-free connection



Rynglok's patented design makes it possible to exceed lightning strike requirements by conducting high surface currents "spark free".

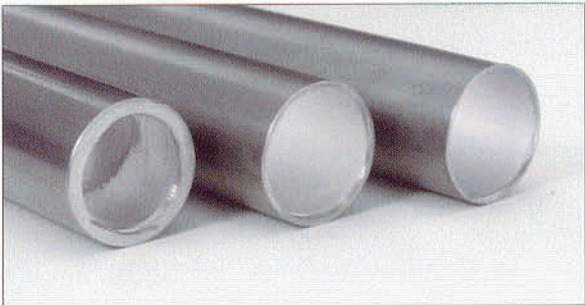
The continuous metal contact insures very low electrical resistance which prevents sparking in critical applications such as aircraft fuel tanks.

RYNGLOK® Saves Time and Money

Rynglok simplifies inventory and logistics requirements for both production and repair applications. Rynglok is capable of handling the numerous classes of fluid systems found in the aerospace industry. Rynglok fittings are not sensitive to type of tubing used, nor wall thickness.

The Rynglok Advantage

- One titanium fitting for all tube materials
- No need for different aluminum, CRESS or titanium fittings
- One titanium fitting for all wall thicknesses
- No need for different 3000, 4000 and 5000 psi fittings



Rynglok's simplified repair method greatly reduces repair time. The system is not time sensitive and the installation tool head does not require 360 degree access around the tube to be repaired. With Rynglok there is no need to disconnect long runs of tubing to complete the repair.

Rynglok has proven its superior capabilities to repair tube at all pressure ratings used in military and commercial aircraft.

This chart shows that the pressure rating of the Rynglok fitting exceeds that of a standard aerospace tube.

Tube O.D. (inch)	Titanium Rynglok Fitting Pressure Rating (psi)
3/16	8,000
1/4	8,000
5/16	8,000
3/8	8,000
1/2	8,000
5/8	8,000
3/4	8,000
7/8	4,000
1	5,000
1-1/4	4,000
1-1/2	2,500

RYNGLOK® Installation Tooling

Rynglok Tooling Design Features

- One tube diameter - Any tube - One tool. One Rynglok tool assembles all Rynglok fittings for a given tube diameter
- Universal tools accommodate both forward (push) and reverse (pull) installation
- Small tool envelope accommodates installation and repair of high density aircraft systems
- Minimal tool head wear
- No tool assembly required
- Rynglok tools require only 180 degree access to make repairs. Time consuming line disconnection to accommodate 360 degree access is eliminated
- Minimal operator training required
- Tools are constructed of safe low-stressed ductile material
- Time is not a factor in the assembly process
- Rynglok assembly is simple, repeatable, reliable and safe

RYNGLOK® Tool Kits

Tool kits for the Rynglok Tube Fitting System can be customized to accommodate your specific requirements.

The kit shown RTSK8-02-002 includes everything that you need to repair any size tube between 3/16" and 1-1/2" diameter.



RYNGLOK® Universal Tools

- Allow easy installation in limited areas
- Eliminate the need for both forward (push) and reverse (pull) tooling



PUSH

Forward Mode: Ring is being pushed



PULL

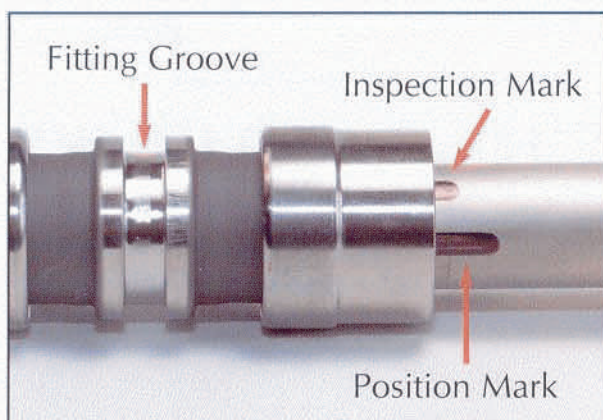
Reverse Mode: Ring is being pulled

RYNGLOK® Fitting System Installation Sequence



1. Mark the Tube

Position the marking gage on the end of the cut tube. Use a suitable marking pen to make the position and inspection marks.



2. Position the Fitting

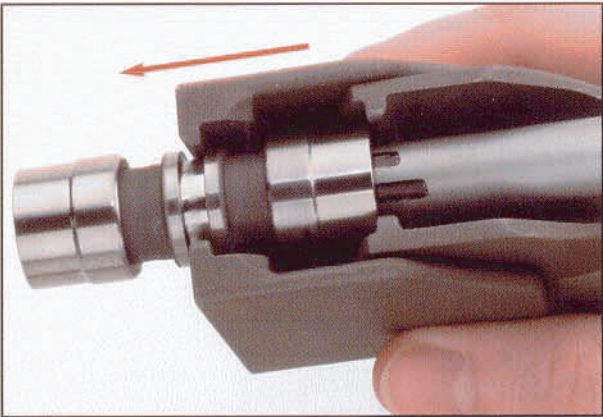
Place the fitting on the tube within the limits of the positioning mark.



3. Position the Tool

When using the tool in the forward mode as shown, position the tool onto the fitting with the tube side of the ring nested into the moveable jaw. If positioned properly, the front end of the tool will be in the fitting groove. Make sure that the fitting is bottomed into the tool.

Simple and Easy



- 4. Swaging the Fitting**
To swage the fitting, apply pressure. Upon completion of swaging, release the pressure, the moveable jaw will return to the original position.

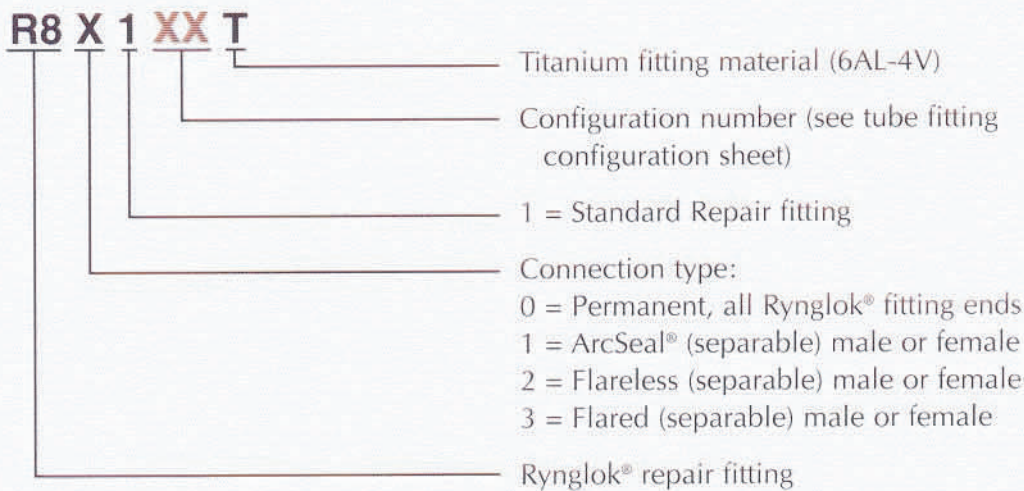


- 5. Inspect the Installation**
Visually inspect that the ring is fully advanced onto the fitting using the inspection gage. Be sure to verify that the edge of the fitting is within the limits of the inspection mark.

The above steps are repeated for each leg of the Rynglok fitting.

RYNGLOK® Fitting Part Number System and How to Order

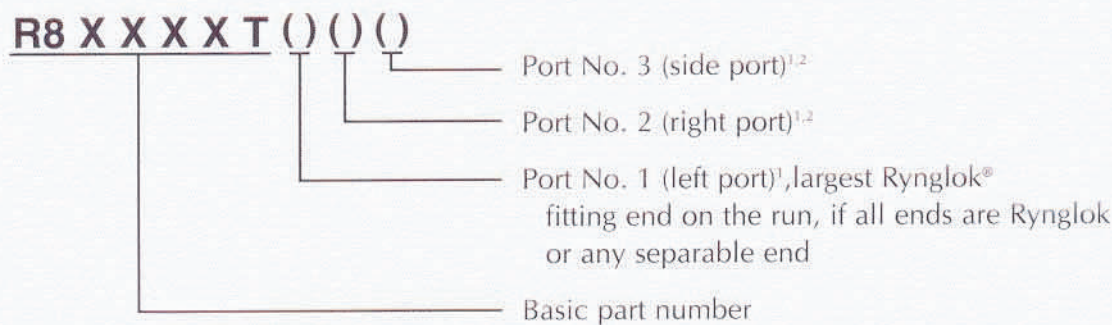
Basic Part Number Designation



Example: **R81103T**

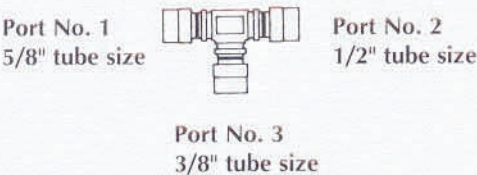
Rynglok® repair fitting, female ArcSeal® (separable) to Rynglok® fitting in the 90° elbow configuration.

How To Order



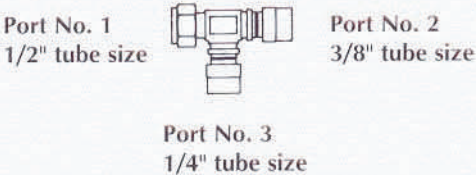
Example: **R80154T100806**

Rynglok® repair fitting, reducing tee, all legs permanent.



Example: **R81154T080604**

Rynglok® repair fitting, reducing tee, with female ArcSeal® separable.







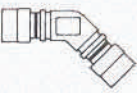


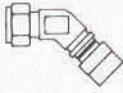




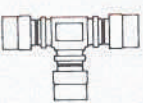
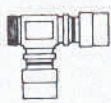
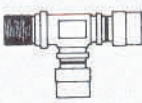
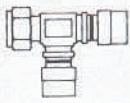

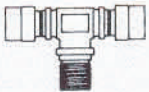
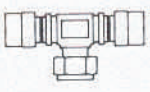
¹ Tube size is specified in 1/16" increments, (i.e., 08=8/16ths or 1/2")

² Port 2 and 3 only required for reducer fittings

NOTE: Port numbering system is in accordance with AIR 1590.

For additional information contact Aeroquip Corporation, Engineered Systems Group, 300 S. East Ave., Jackson, Michigan 49203 (517) 787-8121

Rynglok® Tube Fitting

Rynglok	PERMANENT TO PERMANENT	PERMANENT TO ARCSEAL®		
		MALE MIL-F-85421/1 OR MIL-F-85720/1	MALE MIL-F-85421/2 OR MIL-F-85720/1 BULKHEAD	FEMALE MATES WITH MIL-F-85421 & MIL-F-85720
UNION				
Non-Reducer	R80101T()	R81121T()	R81141T()	R81101T()
Reducer	R80151T()()	R81171T()()	R81191T()()	R81151T()()
45° ELBOW				
Non-Reducer	R80102T()	R81122T()	R81142T()	R81102T()
Reducer	R80152T()()	R81172T()()	R81192T()()	R81152T()()
90° ELBOW				
Non-Reducer	R80103T()	R81123T()	R81143T()	R81103T()
Reducer	R80153T()()	R81173T()()	R81193T()()	R81153T()()
TEE (Separable on Run)				
Non-Reducer	R80104T()	R81124T()	R81144T()	R81104T()
Reducer	R80154T()()	R81174T()()	R81194T()()	R81154T()()
TEE (Separable on Side)				
Non-Reducer		R81126T()	R81146T()	R81106T()
Reducer		R81176T()()	R81196T()()	R81156T()()

Configuration



PERMANENT TO “MS” FLARELESS			PERMANENT TO “AN” FLARED		
MALE	MALE	FEMALE	MALE	MALE	FEMALE
MS33514	MS33515	NAS 1760 MODIFIED	AS4395 (MS33656)	AS4396 (MS33657)	AS1708
R82121T()	R82141T()	R82101T()	R83121T()	R83141T()	R83101T()
R82171T()()	R82191T()()	R82151T()()	R83171T()()	R83191T()()	R83151T()()
R82122T()	R82142T()	R82102T()	R83122T()	R83142T()	R83102T()
R82172T()()	R82192T()()	R82152T()()	R83172T()()	R83192T()()	R83152T()()
R82123T()	R82143T()	R82103T()	R83123T()	R83143T()	R83103T()
R82173T()()	R82193T()()	R82153T()()	R83173T()()	R83193T()()	R83153T()()
R82124T()	R82144T()	R82104T()	R83124T()	R83144T()	R83104T()
R82174T()()	R82194T()()	R82154T()()	R83174T()()	R83194T()()	R83154T()()
R82126T()	R82146T()	R82106T()	R83126T()	R83146T()	R83106T()
R82176T()()	R82196T()()	R82156T()()	R83176T()()	R83196T()()	R83156T()()