

TITIFLEX INDUSTRIAL ASSEMBLY PROCEDURE

**TITLE: R105/R115/R122/R144 SERIES MEDIUM PRESSURE HOSE
ASSEMBLIES UTILIZING TK2 FITTINGS (ABRASIVE WHEEL)**

**AP-33
Rev. B**

1.0 PURPOSE

To establish assembly instructions and inspection procedures for R105/R115/R122/R144 Series medium pressure extruded PTFE assemblies using TK2 fittings for assemblies cut with an abrasive wheel.

2.0 DEFINITIONS

N/A

3.0 ASSOCIATED DOCUMENTS

INQP-305 Problem Resolution System

4.0 PROCEDURE

4.1 Preparation of Hose

4.1.1 Select the appropriate R105, R115, R122 or R144 hose and calculate the desired hose length by subtracting the fitting deduct length of both end fittings.

4.1.2 Wrap the cutting area of the hose with a single layer of reinforced packing tape or masking tape. Note: This step may be omitted for sizes 4, 5 and 6 hose.

4.1.3 Measure with a tape measure or other suitable device and cut hose (See Figure #1) to predetermined length with standard cutoff wheel or other suitable device. Ends must be cut clean and approximately square.

NOTE: When measuring hose length at this operation or at 4.6, it is permissible to measure from the 1" mark on the tape to minimize wear on the tab.

4.1.4 Trim off any burrs in the innercore using a sharp knife or chamfer tool and blow out any grit from ID of hose using clean shop air.

4.1.5 Trim off any excess braid wire using wire snips or the edge of the cut-off wheel to achieve a consistent outside diameter. Excessive braid wire left behind from the cutting operation can affect the assembly of the fitting to the hose.

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4.2 Hose/Fitting Insertion (One Piece Fitting)

4.2.1 Expand the hose ends per Figure #2 using appropriate hose expander as shown in Table 4. The expander should be rotated inside the hose 4 – 6 revolutions using a hand held variable speed drill at slow speed. Remove the tape from the ends of the hose.

4.2.2 Place fitting collar end up per Figure #3 into appropriate 117483-X Fitting Installation Fixture and cap off with the split dies halves. Push hose end firmly into the die halves per Figure #4 until hose bottoms in collar. A slight twisting motion may be required. (Note: To insure the hose is bottomed in the collar, mark the hose OD prior to installing fitting where the collar ends. Push on the hose until the end of the collar now meets the mark on the hose OD.)

4.2.2 Repeat for other end of hose.

4.3 Hose/Fitting Insertion (Two Piece Fitting)

4.3.1 Remove tape from cut ends of the hose. Place collar into appropriate 117484-X Fitting Installation Fixture per Figure #7 and cap off with the split dies halves. Push hose end firmly into the die halves until hose bottoms in collar. A slight twisting motion may be required. (Note: To insure the hose is bottomed in the collar, remove the collar from the installation fixture and visually inspect the opposite end of the collar for the hose.)

4.3.2 Repeat for other end of hose.

4.3.3 Expand the hose end per Figure #8 using appropriate hose expander as shown in Table 4 by inserting the expander through the open end of the collar. The expander should be rotated inside the hose 4 – 6 revolutions using a hand held variable speed drill at slow speed.

4.3.4 Repeat for other end of hose.

4.3.5 Assemble fitting into prepared hose end by hand and push the fitting until it bottoms against the collar per Figure #9. Note: It may be necessary to use the side of a bench or other suitable device to facilitate the fitting insertion.

4.4 Crimping Procedure

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Place and crimp the entire length of the retaining collar to the dimensions shown in Table 1 or Table 2 for detailed crimping dimensions. Note: The entire length of the collar must be crimped.

4.5 Swage Procedure

Select the appropriate swage die and pusher set from Table 4 for R115/R122 hose and Table 5 for R105/R144 hose for the size assembled. Place the dies around the assembly and into the swage machine paying close attention to not pinch the reinforcing braid of the hose between swage die halves. Activate the swager and push the fitting into the die set per Figures #6 or 10 until the hex of the fitting makes contact with the top of the die set. Retract swage pusher and remove hose assembly from die halves. Repeat for other end.

4.6 Inspection and Test Procedure

- 4.6.1 Perform a visual/dimensional inspection of the assembly per the following:
- A. Crimp/Swage Diameter - Measure first piece and visually
 - B. Overall Length - compare to remainder of order.
 - C. Swage Length -

Overall length tolerances are shown below and crimp/swage diameter and swage length per Table 1 or Table 2.

Use a vernier or equivalent to measure crimp diameter and a tape measure to measure overall length. The tape measure does not require calibration.

Overall length and dimensional tolerances are as follows:

Up to 18"	+1/4" - 1/8"
18" to 36"	+1/2" - 1/4"
36" to 50"	+1" - 1/2"

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Over 50" +2"
 - 1"

4.6.2 Pressure test each assembly with water per the following:

- a. Connect assemblies to pressure manifold.
- b. Run water through assemblies to remove air. Leave water on.
- c. Place caps on assemblies.
- d. Adjust pressure to proof value specified in Table 1 for R115/R122 and Table 2 for R105/R144 of this document.
- e. With air hose, blow water from outside of hose assemblies.
- f. Set timer for three minutes minimum or four minutes maximum.
- g. Examine lines. Any evidence of leakage constitutes failure.
- h. Complete Pressure Test Log and initial Factory Order or Router as required.

4.6.3 Sampling of pressure test is permitted in accordance with Table 3. If any part is rejected, the entire lot is to be tested. Acceptable parts shall be routed to packing/stores and shipping. Rejectable parts shall be processed per INQP-305: Problem Resolution System.

TABLE 1 R115/R122 Hose Crimp/Swage Diameters

Size	Crimp/Swage Diameter ±.005	Swage Length (Min)	Max Operating Pressure, Room Temp. (PSI)	Proof Pressure (PSI) ±100 psi
-4	.350	.426	3000	4500
-5	.404	.426	3000	4500
-6	.478	.545	2500	3750
-8	.568	.572	2000	3000
-10	.705	.668	1500	2250
-12	.800	.733	1200	1800
-16	1.057	.854	1000	1500

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TABLE 2 R105/R144 Hose Crimp/Swage Diameters

Size	Crimp/Swage Diameter ±.005	Swage Length (Min)	Max Operating Pressure, Room Temp. (PSI)	Proof Pressure (PSI) ±100 psi
-4	.375	.426	3000	4500
-5	.432	.426	3000	4500
-6	.492	.545	2500	3750
-8	.585	.572	2000	3000
-10	.724	.668	1500	2250
-12	.818	.733	1200	1800
-16	1.066	.854	800	1200

TABLE 3

Lot Size*	Sample Size
2 to 8	All
9 to 15	9
16 to 25	13
26 to 50	13
51 to 90	13
91 to 150	13
151 to 280	50
281 to 500	50

- For lot sizes above 500 contact Quality Engineering for sample size.

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TABLE 4 R115/R122 Swage Tools

Size	Swage Dies	Hose Expander	JIC Pusher	MNPT Pusher
4	117455-4	T168658-4	117512-04	106576-02 (1/8") 106576-04 (1/4")
5	117455-5	T168658-5	117512-05	106576-04 (1/4")
6	117455-6	T168658-6	117512-06	106576-04 (1/4") 106576-06 (3/8")
8	117455-8	T168658-8	117512-08	106576-06 (3/8") 106576-08 (1/2")
10	117455-10	T168658-10	117512-10	106576-08
12	117455-12	T168658-12	117512-12	106576-12
16	117455-16	T168658-16	117512-16	106576-16

TABLE 5 R105/R144 Swage Tools

Size	Swage Dies	Hose Expander	JIC Pusher	MNPT Pusher
4	117455-4A	T168658-4	117512-04	106576-02 (1/8") 106576-04 (1/4")
5	117455-5A	T168658-5	117512-05	106576-04 (1/4")
6	117455-6A	T168658-6	117512-06	106576-04 (1/4") 106576-06 (3/8")
8	117455-8A	T168658-8	117512-08	106576-06 (3/8") 106576-08 (1/2")
10	117455-10A	T168658-10	117512-10	106576-08
12	117455-12A	T168658-12	117512-12	106576-12
16	117455-16A	T168658-16	117512-16	106576-16

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Figure #1: Hose Cut-off – Abrasive Wheel



Figure #2: Hose Expanding – One Piece Fitting

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Figure #3: One Piece Fitting Installation Fixture



Figure #4: One Piece Fitting Assembly onto Hose

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Figure #5: Assembled One Piece Fitting

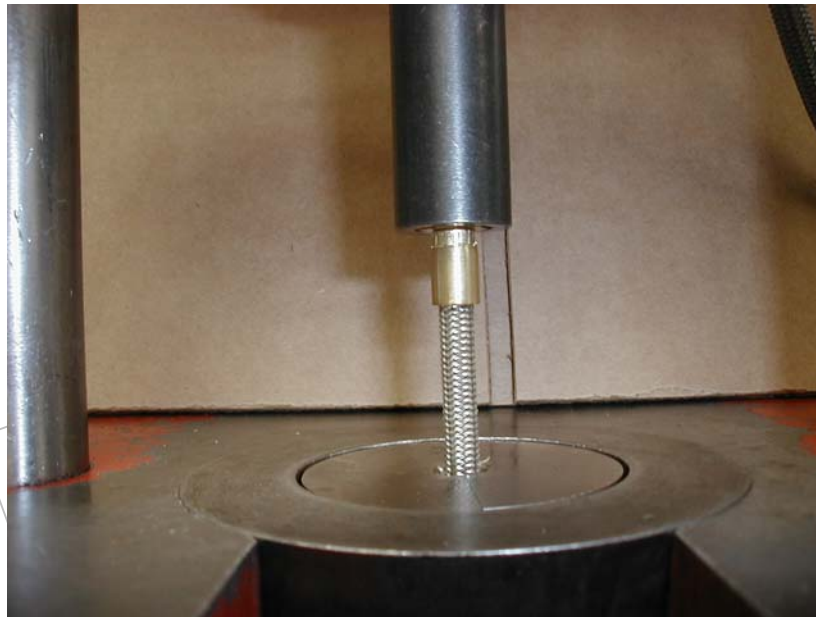


Figure #6: Swaging of One Piece Fitting

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Figure #7: Collar Assembly – Two Piece Fitting



Figure #8: Hose Expansion – Two Piece Fitting

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Figure #9: Assembled Two Piece Fitting



Figure #10: Swaging of Two Piece Fitting

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Figure #11: Swaged Two Piece Fitting

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