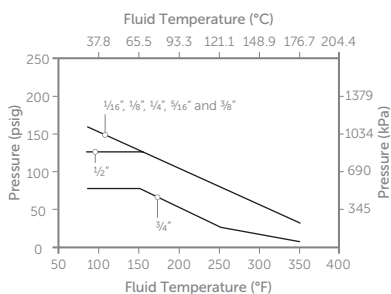


Integral Ferrule Fittings

Assembly procedures

SPECIFICATIONS

Pressure vs. Temperature



Ratings determined using a safety factor of 1.5

Chemical Compatibility

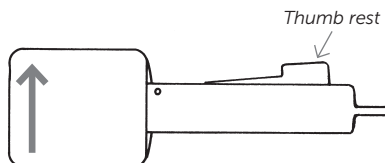
Refer to www.entegris.com/resources/technical-information for chemical compatibility information.

TUBE PREPARATION

1. Obtain Entegris groove tool designed to groove outside diameter (OD) of tubing. All tube sizes 1/8\" and larger must be grooved with an Entegris groove tool.
2. Cut tube end squarely using an Entegris tube cutter.

GROOVING

1. Depress thumb rest until it bottoms out.
2. Insert tube into groove tool until it bottoms out.
3. Release thumb rest.
4. Rotate groove tool in direction of arrow four complete revolutions. Be careful not to move the tube at the same time.
5. Depress thumb rest, remove tube and inspect to be certain that depth is uniform and free from any burrs.



GROOVE DEPTH	TUBING SIZE
0.009"	1/8", 3 mm
0.012"	1/4", 5/16", 3/8", 6 mm, 8 mm, 10 mm
0.020"	1/2", 12 mm
0.015"	3/4"

Tolerance is $\pm 0.005"$

INTEGRAL FERRULE FITTING ASSEMBLY

1. Slide ferrule nut onto tube past groove.
2. Insert grooved tube end into integral ferrule until it bottoms out.
3. Slide ferrule nut to fitting and hand tighten.
4. Pull on tubing **SLOWLY** until ferrule catches on grooved edge.
5. Ensure fitting is hand tight.
6. Tighten ferrule nut with a wrench to the recommended torque specifications in Table 1. **DO NOT OVERTIGHTEN.**

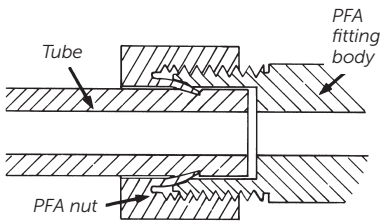
Table 1. Recommended assembly torque

GROOVE TOOL PART NUMBER	FITTING SIZE	TORQUE	APPROXIMATE WRENCH TURNS BEYOND HAND TIGHT
N/A	1/16"	3.5 In•lbs (0.40 N•m)	1
GT2	1/8"	5.0 In•lbs (0.57 N•m)	3/4
GT4	1/4"	8.0 In•lbs (0.90 N•m)	3/4
GT5	5/16"	8.0 In•lbs (0.90 N•m)	1
GT6	3/8"	18.0 In•lbs (2.03 N•m)	1 1/4
GT8	1/2"	30.0 In•lbs (3.39 N•m)	1 1/4
GT12	3/4"	35.0 In•lbs (3.96 N•m)	3/4
N/A	3 mm	5.0 In•lbs (0.57 N•m)	3/4
GT6M	6 mm	6.0 In•lbs (0.68 N•m)	3/4
GT8M	8 mm	7.0 In•lbs (0.79 N•m)	1
GT10M	10 mm	18.0 In•lbs (2.03 N•m)	1 1/4
GT12M	12 mm	26.0 In•lbs (2.94 N•m)	3/4

INTEGRAL FERRULE NUT/TUBE CONSTRUCTION

Laboratory testing of PFA fittings and FEP/PFA tubing (grooved with an Entegris grooving tool) show successful results under extreme heat and pressure conditions. Performance reliability is dependent on the care and caution used in grooving the tube and tightening the fitting properly.

NOTE: the tubing must be heavy walled (0.047" to 0.062" wall thickness) and must meet Entegris tubing specifications. 1/8" uses 0.030" wall thickness.



TROUBLESHOOTING

If leakage occurs follow this troubleshooting checklist:

- Use only standard wall tubing manufactured by Entegris.
- Use only Entegris tools for grooving and cutting.
- Verify that tubing OD size matches fitting sizes.
- Verify proper assembly tightness with torque wrench.
- No more than 1/4 or 1/2 additional wrench turn should be applied to stop leakage.
- Groove tool blade must be sharp to make a groove of uniform depth.
- Minimize tube side load by reducing bend on tubing immediately before or after the fitting connection.
- Carefully repeat assembly steps.
- When using NPT threads, approximately 1 1/2 threads should be exposed when proper tightness is achieved.

When assembling tube fittings:

- Tighter is not always better. Fittings in service that are not leaking do not need to be tightened.
- **Do not** overtighten ferrule nut. Overtightening may strip threads or induce stress cracking.
- **Do not** tape or use sealant on tube threads or tube.
- **Do not** bend tubing excessively before or after the fitting connection.
- Prevent possible leak paths by fully depressing the groove tool thumb rest before inserting or removing tubing.

FOR MORE INFORMATION

Please call your Regional Customer Service Center today to learn what Entegris can do for you. Visit entegris.com and select the Contact Us link to find the customer service center nearest you.

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