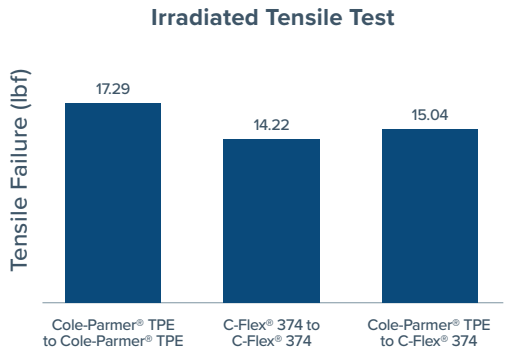
Cole-Parmer®

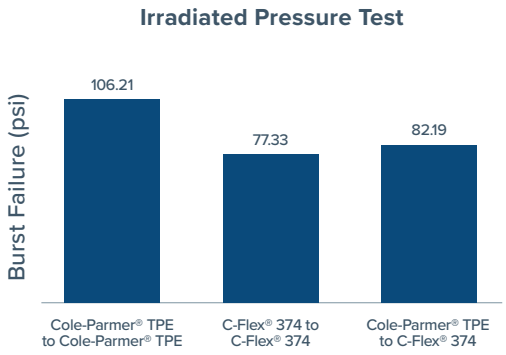
Cole-Parmer
Thermoplastic Elastomer (TPE) Tubing

Weld Burst and Tensile Testing Results Gamma Irradiated

Gamma Irradiated Tube Weld Test Data (0.125 ID by 0.250 OD Tubing) – Sartorius Biowelder®

Tube	Samples Tested	Average Tensile Failure (lbf)	Average Burst Pressure (psi)
Cole-Parmer® TPE to Cole-Parmer® TPE	10	17.29	106.21
C-Flex® 374 to C-Flex® 374	10	14.22	77.33
Cole-Parmer® TPE to C-Flex® 374	10	15.04	82.19





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China	86.21.5109.9909	Italy	+39.02.84349215
India	+1.800.266.1244	All others	+1.847.549.7600

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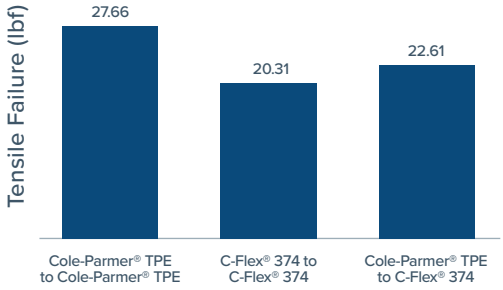
*Inquiries from Germany and France are now handled in our St. Neots office by native-speaking experts.

Weld Burst and Tensile Testing Results Gamma Irradiated (continued)

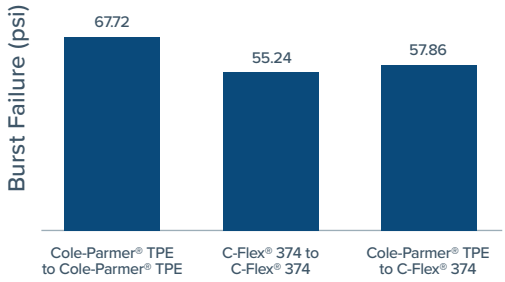
Gamma Irradiated Tube Weld Test Data (0.250 ID by 0.375 OD Tubing) – Sartorius Biowelder®

Tube	Samples Tested	Average Tensile Failure (lbf)	Average Burst Pressure (psi)
Cole-Parmer® TPE to Cole-Parmer® TPE	10	27.66	67.72
C-Flex® 374 to C-Flex® 374	10	20.31	55.34
Cole-Parmer® TPE to C-Flex® 374	10	22.61	57.86

Irradiated Tensile Test



Irradiated Pressure Test



Test Procedure

Gamma Irradiation

All tubes were dosed between 25 kGy and 50 kGy.

Welding Procedure

All tubes were welded in a Sartorius welder with standard settings. Cole-Parmer® TPE did not have a setting, so the C-Flex® 374 setting was used. Tensile samples were created with a first-use blade, and pressure samples with a second-use blade. Samples for tensile and pressure testing were made to be 4 inches and 6 inches long, respectively.

Tensile Test Procedure

All samples were pulled in a Mark-10 test stand at 20 inches per minute until failure occurred. The failure mode and force at which a failure occurred were recorded.

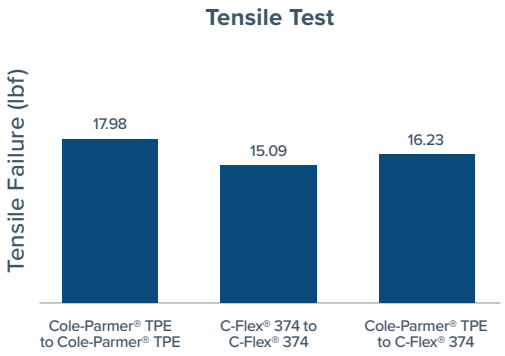
Pressure Test Procedure

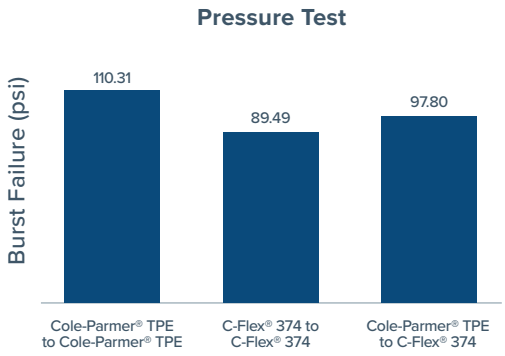
All tubes were tested with a closed-loop hydrostatic testing system on barbed fittings, secured with nylon Handy Clamps. Tubes were bled of all air to maintain consistent accurate results. Pressure was slowly increased until failure was observed. Failure mode and maximum pressure were recorded.

Weld Burst and Tensile Testing Results Nonirradiated

Tube Weld Test Data (0.125 ID by 0.250 OD Tubing) – Sartorius Biowelder®

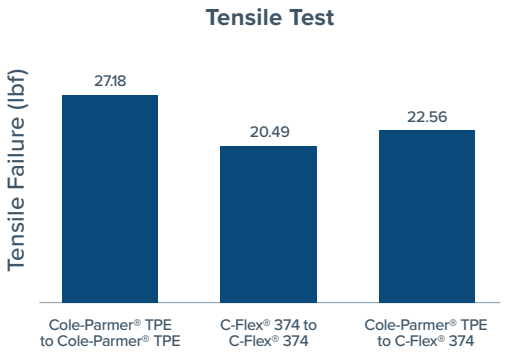
Tube	Samples Tested	Average Tensile Failure (lbf)	Average Burst Pressure (psi)
Cole-Parmer® TPE to Cole-Parmer® TPE	6	17.98	110.31
C-Flex® 374 to C-Flex® 374	6	15.09	89.49
Cole-Parmer® TPE to C-Flex® 374	6	16.23	97.80

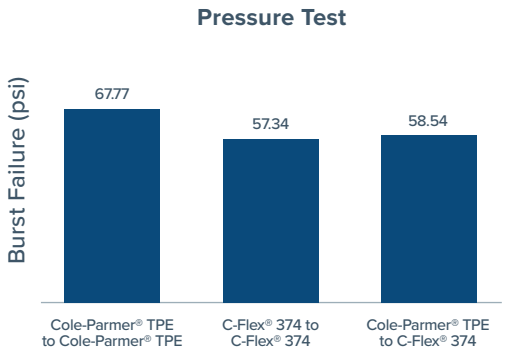




Tube Weld Test Data (0.250 ID by 0.375 OD Tubing) – Sartorius Biowelder®

Tube	Samples Tested	Average Tensile Failure (lbf)	Average Burst Pressure (psi)
Cole-Parmer® TPE to Cole-Parmer® TPE	6	27.18	67.77
C-Flex® 374 to C-Flex® 374	6	20.49	57.34
Cole-Parmer® TPE to C-Flex® 374	6	22.56	58.54





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Weld Burst and Tensile Testing Results Nonirradiated (continued)

Test Procedure

Welding Procedure

All tubes were welded in a Sartorius welder with standard settings. Cole-Parmer® TPE did not have a setting optimized for it, so the C-Flex® 374 setting was used. Tensile samples were created with a first-use blade, and pressure samples with a second-use blade. Samples for tensile and pressure testing were made to be 4 inches and 6 inches long, respectively.

Tensile Test Procedure

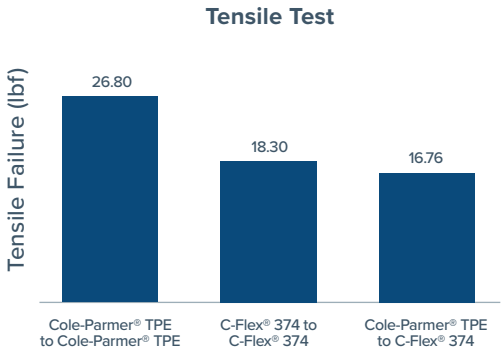
All samples were pulled in a Mark-10 test stand at 20 inches per minute until failure occurred. The failure mode and force at which a failure occurred were recorded.

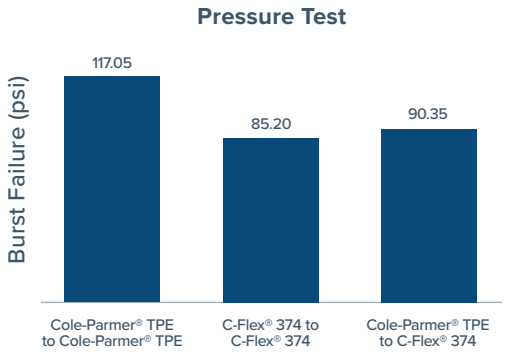
Pressure Test Procedure

All tubes were tested with a closed-loop hydrostatic testing system on barbed fittings, secured with nylon Handy Clamps. Tubes were bled of all air to maintain consistent accurate results. Pressure was slowly increased until failure was observed. Failure mode and maximum pressure were recorded.

Tube Weld Test Data (0.125 ID by 0.250 OD Tubing) – Terumo SCD-IIB Welder®

Tube	Samples Tested	Average Tensile Failure (lbf)	Average Burst Pressure (psi)
Cole-Parmer® TPE to Cole-Parmer® TPE	10	26.80	117.05
C-Flex® 374 to C-Flex® 374	10	18.30	85.20
Cole-Parmer® TPE to C-Flex® 374	10	16.76	90.35





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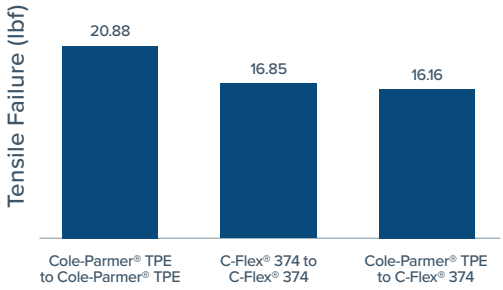
Weld Burst and Tensile Testing Results Gamma Irradiated

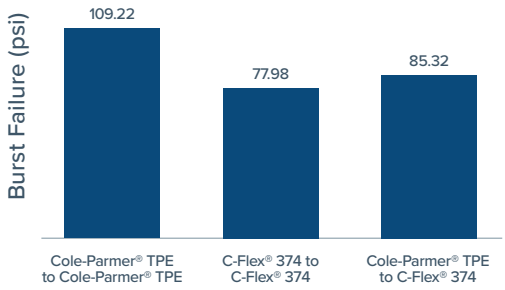
Tube Weld Test Data (0.250 ID by 0.375 OD Tubing) – Terumo SCD-IIB Welder®

Tube	Samples Tested	Average Tensile Failure (lbf)	Average Burst Pressure (psi)
Cole-Parmer® TPE to Cole-Parmer® TPE	10	20.88	109.22
C-Flex® 374 to C-Flex® 374	10	16.85	77.98
Cole-Parmer® TPE to C-Flex® 374	10	16.16	85.32

Irradiated Tensile Test



Irradiated Pressure Test



Test Procedure

All tubes were dosed between 25 kGy and 50 kGy.

Welding Procedure

All tubes were welded using a Terumo SCD-IIB with standard settings. Samples for tensile and pressure testing were made to be 4 inches and 6 inches long, respectively.

Tensile Test Procedure

All samples were pulled in a Mark-10 test stand at 20 inches per minute until failure occurred. The failure mode and force at which a failure occurred were recorded.

Pressure Test Procedure

All tubes were tested with a closed-loop hydrostatic testing system on barbed fittings, secured with nylon Handy Clamps. Tubes were bled of all air to maintain consistent accurate results. Pressure was slowly increased until failure was observed. Failure mode and maximum pressure were recorded.

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