

MODEL M21 MECHANICAL TEE, FEMALE THREADED OUTLET

The **Shurjoint** Model M21 features an advanced design and when mounted on hole cut pipe the Model M21 provides a fast and easy mid-pipe threaded branch outlet. Threads are NPT per ANSI B1.20 or BSPT per ISO 7. By utilizing the Model M21 you can eliminate the need for welding or the use of multiple fittings. The M21 Mechanical Tee is comprised of upper and lower ductile iron housing segments, a grade "E" EPDM rubber gasket (Model M21 & M22 gaskets are interchangeable) and plated track bolts and nuts.

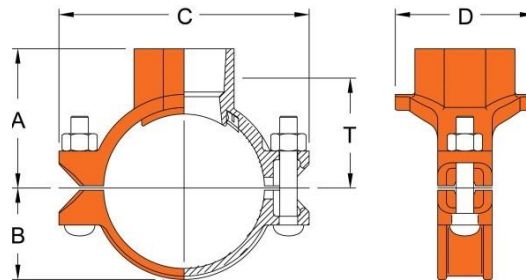
Mechanical tees are supplied with our standard painted finishes, i.e. orange or RAL3000 red. Optional finishes such as hot dipped zinc galvanized and custom epoxy coatings are also available.

Shurjoint mechanical tees: Model M21, M22, 7721 & 7722 can also be used on applicable IPS size HDPE pipe. When used in conjunction with HDPE pipe the pressure rating would be the lower of the fitting or pipe rating. Please note **Shurjoint** mechanical tees are not recommended for use on PVC plastic pipe.

Important Note: Model M21 housing segments are not compatible and should not be used with other **Shurjoint** mechanical tee housing segments such as Model 7721 & 7722 mechanical tees.



For Fire Protection pressure rating, listing, and approval information, refer to Data Sheet B-42 or visit **SHURJOINT** website, www.shurjoint.com for details or contact your **SHURJOINT** Representative.



Full warranty terms can be found on www.shurjoint.com

Model M21 Mechanical Tee, Female Threaded Outlet

Nominal Size Run x Branch	Pipe O.D.	Max. Working Pressure (CWP)*	Hole Dia. ♂ +3.2, -0 / +0.13, -0	Dimensions					Bolt Size	Weight
				T±	A	B	C	D		
in mm	in mm	PSI Bar	in mm	in mm	in mm	in mm	in mm	in mm	in mm	Lbs Kgs
2 x ½ 50 x 15	2.375 x 0.840 60.3 x 21.3	300 20	1.50 38	1.97 50	2.50 63.5	1.50 38.1	4.56 115.9	3.19 81	¾ x 2½ M10 x 55	2.18 0.99
2 x ¾ 50 x 20	2.375 x 1.050 60.3 x 26.7	300 20	1.50 38	1.97 50	2.50 63.5	1.50 38.1	4.56 115.9	3.19 81	¾ x 2½ M10 x 55	2.22 1.01
2 x 1 50 x 25	2.375 x 1.315 60.3 x 33.4	300 20	1.50 38	1.85 47	2.50 63.5	1.50 38.1	4.56 115.9	3.19 81	¾ x 2½ M10 x 55	2.40 1.09
2 x 1¼ 50 x 32	2.375 x 1.660 60.3 x 42.2	300 20	[1.75] [45]	2.05 52	2.87 73.0	1.50 38.1	4.56 115.9	3.31 84	¾ x 2½ M10 x 55	2.77 1.26
2 x 1½ 50 x 40	2.375 x 1.900 60.3 x 48.3	300 20	[1.75] [45]	2.08 52	3.00 76.2	1.50 38.1	4.56 115.9	3.31 84	¾ x 2½ M10 x 55	3.01 1.37
2½ x ½ 65 x 15	2.875 x 0.840 73.0 x 21.3	300 20	1.50 38	2.20 56	2.75 69.9	1.75 44.5	5.56 141.3	3.19 81	½ x 2¾ M12 x 60	2.60 1.20
2½ x ¾ 65 x 20	2.875 x 1.050 73.0 x 26.7	300 20	1.50 38	2.20 56	2.75 69.9	1.75 44.5	5.56 141.3	3.19 81	½ x 2¾ M12 x 60	2.70 1.20
2½ x 1 65 x 25	2.875 x 1.315 73.0 x 33.4	300 20	1.50 38	2.09 53	2.75 69.9	1.75 44.5	5.56 141.3	3.19 81	½ x 2¾ M12 x 60	2.86 1.30
2½ x 1¼ 65 x 32	2.875 x 1.660 73.0 x 42.2	300 20	2.00 51	2.28 58	3.00 76.2	1.75 44.5	5.56 141.3	3.70 94	½ x 2¾ M12 x 60	3.21 1.46
2½ x 1½ 65 x 40	2.875 x 1.900 73.0 x 48.3	300 20	2.00 51	2.28 58	3.00 76.2	1.75 44.5	5.56 141.3	3.70 94	½ x 2¾ M12 x 60	3.43 1.56

Model M21 Mechanical Tee, Female Threaded Outlet

Nominal Size Run x Branch	Pipe O.D.	Max. Working Pressure (CWP)*	Hole Dia. $\bar{T}$ +3.2, -0 / +0.13, -0	Dimensions					Bolt Size	Weight
				T#	A	B	C	D		
				in	in	in	in	in		
in	in	PSI	in	in	in	in	in	in	in	Lbs
mm	mm	Bar	mm	mm	mm	mm	mm	mm	mm	Kgs
76.1 mm x 15	3.000 x 0.840	300	1.50	2.20	2.75	1.81	5.69	3.19	$\frac{1}{8}$ x 2 $\frac{3}{4}$	2.64
	76.1 x 21.3	20	38	56	69.9	46.1	144.5	81	M12 x 60	1.20
76.1 mm x 20	3.000 x 1.050	300	1.50	2.20	2.75	1.81	5.69	3.19	$\frac{1}{8}$ x 2 $\frac{3}{4}$	2.64
	76.1 x 26.7	20	38	56	69.9	46.1	144.5	81	M12 x 60	1.20
76.1 mm x 25	3.000 x 1.315	300	1.50	2.09	2.75	1.81	5.69	3.19	$\frac{1}{8}$ x 2 $\frac{3}{4}$	2.86
	76.1 x 33.4	20	38	53	69.9	46.1	144.5	81	M12 x 60	1.30
76.1 mm x 32	3.000 x 1.660	300	2.00	2.28	3.00	1.81	5.69	3.70	$\frac{1}{8}$ x 2 $\frac{3}{4}$	3.21
	76.1 x 42.2	20	51	58	76.2	46.1	144.5	94	M12 x 60	1.46
76.1 mm x 40	3.000 x 1.900	300	2.00	2.28	3.00	1.81	5.69	3.70	$\frac{1}{8}$ x 2 $\frac{3}{4}$	3.43
	76.1 x 48.3	20	51	58	76.2	46.1	144.5	94	M12 x 60	1.56
3 x $\frac{1}{2}$	3.500 x 0.840	300	1.50	2.36	3.06	2.09	6.19	3.19	$\frac{1}{2}$ x 3	3.17
80 x 15	88.9 x 21.3	20	38	60	77.8	53.2	157.2	81	M12 x 75	1.44
3 x $\frac{3}{4}$	3.500 x 1.050	300	1.50	2.32	3.06	2.09	6.19	3.19	$\frac{1}{2}$ x 3	3.21
80 x 20	88.9 x 26.7	20	38	59	77.8	53.2	157.2	81	M12 x 75	1.46
3 x 1	3.500 x 1.315	300	1.50	2.40	3.06	2.09	6.19	3.19	$\frac{1}{2}$ x 3	3.37
80 x 25	88.9 x 33.4	20	38	61	77.8	53.2	157.2	81	M12 x 75	1.53
3 x 1 $\frac{1}{4}$	3.500 x 1.660	300	2.00	2.56	3.25	2.09	6.19	3.70	$\frac{1}{2}$ x 3	3.98
80 x 32	88.9 x 42.2	20	51	65	82.6	53.2	157.2	94	M12 x 75	1.81
3 x 1 $\frac{1}{2}$	3.500 x 1.900	300	2.00	2.80	3.50	2.09	6.19	3.70	$\frac{1}{2}$ x 3	4.14
80 x 40	88.9 x 48.3	20	51	71	88.9	53.2	157.2	94	M12 x 75	1.88
3 x 2	3.500 x 2.375	300	2.50	2.76	3.50	2.09	6.19	4.25	$\frac{1}{2}$ x 3	4.55
80 x 50	88.9 x 60.3	20	64	70	88.9	53.2	157.2	108	M12 x 75	2.07
4 x $\frac{1}{2}$	3.500 x 0.840	300	1.50	2.83	3.69	2.63	7.19	3.13	$\frac{1}{2}$ x 3	3.59
100 x 15	114.3 x 21.3	20	38	72	93.7	66.7	182.6	79.4	M12 x 75	1.63
4 x $\frac{3}{4}$	4.500 x 1.050	300	1.50	2.79	3.69	2.63	7.19	3.13	$\frac{1}{2}$ x 3	3.61
100 x 20	114.3 x 26.7	20	38	71	93.7	66.7	182.6	79.4	M12 x 75	1.64
4 x 1	4.500 x 1.315	300	1.50	2.87	3.69	2.63	7.19	3.13	$\frac{1}{2}$ x 3	3.74
100 x 25	114.3 x 33.4	20	38	73	93.7	66.7	182.6	79.4	M12 x 75	1.70
4 x 1 $\frac{1}{4}$	4.500 x 1.660	300	2.00	3.07	3.63	2.63	7.19	4.00	$\frac{1}{2}$ x 3	4.18
100 x 32	114.3 x 42.2	20	51	78	92.1	66.7	182.6	101.6	M12 x 75	1.90
4 x 1 $\frac{1}{2}$	4.500 x 1.900	300	2.00	3.31	3.63	2.63	7.19	4.00	$\frac{1}{2}$ x 3	4.49
100 x 40	114.3 x 48.3	20	51	84	92.1	66.7	182.6	101.6	M12 x 75	2.04
4 x 2	4.500 x 2.375	300	2.50	3.27	4.00	2.63	7.19	4.00	$\frac{1}{2}$ x 3	5.00
100 x 50	114.3 x 60.3	20	64	83	101.6	66.7	182.6	101.6	M12 x 75	2.27
4 x 2 $\frac{1}{2}$	4.500 x 2.875	300	2.75	2.87	4.00	2.63	7.19	4.44	$\frac{1}{2}$ x 3	5.43
100 x 65	114.3 x 73.0	20	70	73	101.6	66.7	182.6	112.7	M12 x 75	2.47
100 x 76.1 mm	4.500 x 3.000	300	2.75	2.87	4.00	2.63	7.19	4.44	$\frac{1}{2}$ x 3	5.65
	114.3 x 76.1	20	70	73	101.6	66.7	182.6	112.7	M12 x 75	2.57
4 x 3	4.500 x 3.500	300	3.50	3.31	4.13	2.63	7.19	5.06	$\frac{1}{2}$ x 3	6.41
100 x 80	114.3 x 88.9	20	89	84	104.8	66.7	182.6	128.6	M12 x 75	2.91
139.7 mm x 50	5.500 x 2.375	300	2.50	3.27	4.75	3.19	8.81	4.19	$\frac{5}{8}$ x 3 $\frac{1}{2}$	6.38
	139.7 x 60.3	20	64	83	120.7	81.0	223.8	106.4	M16 x 90	2.90
139.7 mm x 76.1 mm	5.500 x 3.000	300	2.75	3.67	4.75	3.19	8.81	4.57	$\frac{5}{8}$ x 3 $\frac{1}{2}$	7.40
	139.7 x 76.1	20	70	93	120.7	81.0	223.8	115.9	M16 x 90	3.40
139.7 mm x 80	5.500 x 3.500	300	3.50	3.82	4.75	3.19	8.81	5.19	$\frac{5}{8}$ x 3 $\frac{1}{2}$	8.41
	139.7 x 88.9	20	89	97	127.0	81.0	223.8	131.8	M16 x 90	3.82
5 x 2	5.563 x 2.375	300	2.50	3.27	4.75	3.19	8.81	4.19	$\frac{5}{8}$ x 3 $\frac{1}{2}$	6.38
125 x 50	141.3 x 60.3	20	64	83	120.7	81.0	223.8	106.4	M16 x 90	2.90
5 x 2 $\frac{1}{2}$	5.563 x 2.875	300	2.75	3.67	4.75	3.19	8.81	4.44	$\frac{5}{8}$ x 3 $\frac{1}{2}$	7.46
125 x 65	141.3 x 73.0	20	70	93	120.7	81.0	223.8	112.7	M16 x 90	3.39
5 x 3	5.563 x 3.500	300	3.50	3.82	4.75	3.19	8.81	5.19	$\frac{5}{8}$ x 3 $\frac{1}{2}$	8.40
125 x 80	141.3 x 88.9	20	89	97	127.0	81.0	223.8	131.8	M16 x 90	3.82
165.1 mm x 32	6.500 x 1.660	300	2.00	4.41	5.13	3.72	9.87	3.63	$\frac{5}{8}$ x 3 $\frac{1}{2}$	5.57
	165.1 x 42.2	20	51	112	130.2	94.5	250.8	92.1	M16 x 90	2.53
165.1 mm x 40	6.500 x 1.900	300	2.00	4.41	5.13	3.72	9.87	3.63	$\frac{5}{8}$ x 3 $\frac{1}{2}$	6.60
	165.1 x 48.3	20	51	112	130.2	94.5	250.8	92.1	M16 x 90	3.00
165.1 mm x 50	6.500 x 2.375	300	2.50	4.37	5.13	3.72	9.87	4.19	$\frac{5}{8}$ x 3 $\frac{1}{2}$	6.97
	165.1 x 60.3	20	64	111	130.2	94.5	250.8	106.4	M16 x 90	3.17
165.1 mm x 65	6.500 x 2.875	300	2.75	3.98	5.13	3.72	9.87	4.44	$\frac{5}{8}$ x 3 $\frac{1}{2}$	7.88
	165.1 x 73.0	20	70	101	130.2	94.5	250.8	112.7	M16 x 90	3.58

Model M21 Mechanical Tee, Female Threaded Outlet

Nominal Size Run x Branch	Pipe O.D.	Max. Working Pressure (CWP)*	Hole Dia. $\mp$ +3.2, -0 / +0.13, -0	Dimensions					Bolt Size	Weight
				T#	A	B	C	D		
				in	in	in	in	in		
in	in	PSI	in	in	in	in	in	in	in	Lbs
mm	mm	Bar	mm	mm	mm	mm	mm	mm	mm	Kgs
165.1 mm x 76.1 mm	6.500 x 2.875	300	2.75	3.98	5.13	3.72	9.87	4.56	$\frac{5}{8}$ x 3½	8.25
	165.1 x 76.1	20	70	101	130.2	94.5	250.8	115.9	M16 x 90	3.75
165.1 mm x 80	6.500 x 3.500	300	3.50	4.33	5.50	3.72	9.87	5.19	$\frac{5}{8}$ x 3½	9.09
	165.1 x 88.9	20	89	110	139.7	94.5	250.8	131.8	M16 x 90	4.13
165.1 mm x 100	6.500 x 4.500	300	4.50	4.45	5.75	3.72	9.87	6.25	$\frac{5}{8}$ x 3½	10.50
	165.1 x 114.3	20	114	113	146.1	94.5	250.8	158.8	M16 x 90	4.77
6 x 1¼	6.625 x 1.660	300	2.00	4.41	5.13	3.72	9.87	3.63	$\frac{5}{8}$ x 3½	6.41
150 x 32	168.3 x 42.2	20	51	112	130.2	94.5	250.8	92.1	M16 x 90	2.91
6 x 1½	6.625 x 1.900	300	2.00	4.41	5.13	3.72	9.87	3.63	$\frac{5}{8}$ x 3½	6.58
150 x 40	168.3 x 48.3	20	51	112	130.2	94.5	250.8	92.1	M16 x 90	2.99
6 x 2	6.625 x 2.375	300	2.50	4.37	5.13	3.72	9.87	4.19	$\frac{5}{8}$ x 3½	7.00
150 x 50	168.3 x 60.3	20	64	111	130.2	94.5	250.8	106.4	M16 x 90	3.18
6 x 2½	6.625 x 2.875	300	2.75	3.98	5.13	3.72	9.87	4.44	$\frac{5}{8}$ x 3½	7.88
150 x 65	168.3 x 73.0	20	70	101	130.2	94.5	250.8	112.7	M16 x 90	3.58
150 x 76.1 mm	6.625 x 2.875	300	2.75	3.98	5.13	3.72	9.87	4.56	$\frac{5}{8}$ x 3½	9.02
	168.3 x 76.1	20	70	101	130.2	94.5	250.8	115.9	M16 x 90	3.58
6 x 3	6.625 x 3.500	300	3.50	4.33	5.50	3.72	9.87	5.19	$\frac{5}{8}$ x 3½	9.02
150 x 80	168.3 x 88.9	20	89	110	139.7	94.5	250.8	131.8	M16 x 90	4.10
6 x 4	6.625 x 4.500	300	4.50	4.45	5.75	3.72	9.87	6.25	$\frac{5}{8}$ x 3½	10.47
150 x 100	168.3 x 114.3	20	114	113	146.1	94.5	250.8	158.8	M16 x 90	4.76

1. $\mp$ Hole diameters listed are suggested hole diameters.
2. $\mp$ T*: Take-Out (Center of run to end of pipe to be engaged.)
3. [] Important: Make special note of the hole saw size and maximum diameter allowed on these sizes, deviation could lead to joint failure.
4. *Working pressure is based on standard wall carbon steel pipe.

Flow Data – C_v Values

Values for flow of water at +60°F (+16°C).

$$C_v = \frac{Q}{\sqrt{\Delta P}}$$

Where: C_v = Flow coefficient
Q = Flow (GPM)
 ΔP = Pressure drop (psi)

**Model #M21 Mechanical Tee, Female Threaded Outlet
C_v Values**

Nominal Size in / mm	C _v Values	Nominal Size in / mm	C _v Values
$\frac{1}{2}$ 15	17	2 50	100
$\frac{3}{4}$ 20	21	2½ 65	135
1 25	25	3 80	200
1¼ 32	45	4 100	400
1½ 40	60		

Outlet Flow Characteristics
**Model #M21 Mechanical Tee, Female Threaded Outlet
Flow Characteristics**

Nominal Size in / mm	Equivalent Length* feet / meter of pipe	Nominal Size in / mm	Equivalent Length* feet / meter of pipe
$\frac{1}{2}$ 15	2.0 0.6	2 50	6.0 1.8
$\frac{3}{4}$ 20	3.0 0.9	2½ 65	8.0 2.4
1 25	3.0 0.9	3 80	10.0 3.1
1¼ 32	4.0* 1.2	4 100	14.0 4.3
1½ 40	4.0* 1.2		

*Expressed in equivalent of schedule 40 pipe based on Hazen & Williams formula: C=120
Equivalent length of 2" x 1¼" and 2" x 1½" are 6 feet (1.83 meters) and 11 feet (3.36 meters) respectively.

MATERIAL SPECIFICATIONS

• Housing:

Ductile Iron to ASTM A536, Gr. 65-45-12 and or ASTM A395, Gr. 65-45-15, min. tensile strength 65,000 psi (448 MPa).

• Surface Finish:

Orange color painted or red RAL3000 color painted.

- ☐ Hotdipgalvanized (Option).
- ☐ Epoxy coated in red RAL3000 or other colors (Option)

• Rubber Gasket:

Grade “E” EPDM (Color code: Green stripe) Good for cold & hot water up to +230°F (+110°C). Also good for services for water with acid, water with chlorine or chloramines, deionized water, seawater and waste water, dilute acids, oil-free air and many chemicals. **Not recommended for petroleum oils, minerals oils, solvents and aromatic hydrocarbons.**

Maximum Temperature Range: -30°F (-34°C) to +230°F (+110°C)*.

*EPDM gaskets for water services are not recommended for steam services unless couplings or components are accessible for frequent gasket replacement.

- ☐ (Option) **Grade “T” Nitrile** (Color code: Orange stripe) Recommended for petroleum products, air with oil vapors, vegetable and mineral oils within the specified temperature range. Also good for water services under +150°F (+66°C).
Temperature range: -20°F to +180°F (-29°C to +82°C).
Do not use for HOT WATER above +150°F (+66°C) or HOT DRY AIR above +140°F (+60°C)

- ☐ Other options: Grade “O” Fluoroelastomer.
Grade “L” Silicone.

For additional details contact **Shurjoint**.

• Bolts & Nuts:

Heat treated carbon manganese steel track bolts to ASTM A449-83a (or A183 Gr. 2), minimum tensile strength 110,000 psi (758 MPa), Zinc electroplated, with heavy-duty hexagonal nuts to ASTM A563.

General Notes:

- **Maximum Working Pressure (CWP)** listed is the maximum cold water pressure for general piping services tested to ASTM F1476 and or AWWA C606 methods. Figures listed are based standard wall carbon steel pipe. For other pipe schedules or pipe materials, contact **Shurjoint** for additional information.
- **Listed and or Approved Pressures** are pressure ratings for fire protection systems, tested and approved by various approval bodies. Please always refer to the latest approval data posted on the **Shurjoint** website.
- **Field Joint Test:** For one time only the system may be tested hydrostatically at 1½ times the maximum working pressure listed (AWWA C606 5.2.3).
- **Warning:** Piping systems must always be depressurized and drained before attempting disassembly and or removal of any components.
- **The 10 Year Limited Warranty** applies to manufacturing defects only and does not cover severe service/temperature applications or wear parts.
- **Shurjoint** reserves the right to change specifications, designs and or standard without notice and without incurring any obligations.

Shurjoint product specifications in U.S. customary units and metric are approximate and are provided for reference only. For precise measurements, please contact **Shurjoint** Technical Service. **Shurjoint** reserves the right to change or modify product design, construction, specifications, or materials without prior notice and without incurring any obligations to make such changes and modifications on **Shurjoint** products previously subsequently sold.