

**INTERNATIONAL ASSOCIATION OF PLUMBING
AND MECHANICAL OFFICIALS**

**IAPMO GUIDE CRITERIA
FOR**

MOUNTING BRACKETS FOR SINGLE HANDLE TUB/SHOWER VALVES

IGC 197-2004 (R2014)

1. PURPOSE

- 1.1** The purpose of this standard is to establish a generally acceptable standard for mounting brackets used in the installation of single handle tub/shower valves. Its purpose is to serve as a guide for producers, distributors, architects, engineers, contractors, installers, inspectors and users; to promote understanding regarding materials, manufacture and installation; and to provide for identifying mounting brackets that comply with this standard.
- 1.2** The provisions of this standard are not intended to prevent the use of any alternate material, design or method of construction, provided any such alternate meets the intent of this standard.

2. SCOPE

- 2.1** Mounting brackets covered by this standard are intended for use with 1/2" copper pipe during the installation of single handle tub/shower valves to prefabricated, precast or built-up shower/tubs. This standard covers referenced standards, general requirements, testing requirements, installation instructions as well as markings and identification.

3. REFERENCED STANDARDS

- 3.1** All standards referenced herein shall be the current edition of that standard as published at the onset of testing.
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| ASTM B 88 | Standard Specification for Seamless Copper Water Tube |
| ASTM D 256 | Standard Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics |
| ASTM D 638 | Standard Test Method for Tensile Properties of Plastics |
| ASTM D 648 | Standard Test Method for Deflection Temperature of Plastics Under Flexural Load in the Edgewise Position |
| ASTM D 790 | Standard Test Methods for Flexural Properties of Unreinforced and |

ASTM D 792	Reinforced Plastics and Electrical Insulating Materials Standard Test Methods for Density and Specific Gravity (Relative Density) of Plastics by Displacement
ASTM D 1784	Standard Specification for Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds
ASTM D 2240	Standard Test Method for Rubber Property—Durometer Hardness
UL 94	Test for Flammability of Plastic Materials for Parts in Devices and Appliances

4. GENERAL REQUIREMENTS

4.1 Materials

4.1.1 Rigid PVC Compounds.

4.1.2 Plate I. Mounting brackets manufactured from rigid PVC used to secure preassembled pipe and mixing valve assemblies shall have a minimum cell classification of 12454 when tested in accordance with ASTM D 1784.

4.1.3 Plate II. Mounting brackets manufactured from glass-filled (10%) PVC used to secure preassembled pipe and mixing valve assemblies shall comply with the following material requirements:

(a)	<u>Physical Properties</u>	<u>Test Method</u>	<u>Value</u>	<u>Units</u>
	Specific Gravity	ASTM D 792	1.35 – 1.48	N/A
	Durometer Hardness D, Instantaneous	ASTM D 2240	79 – 85	N/A
(b)	<u>Mechanical Properties</u>	<u>Test Method</u>	<u>Value</u>	<u>Units</u>
	Tensile Strength Type 1 - Rigids, Yield, 2 in/min	ASTM D 638	8,100 – 9,900	psi
	Tensile Modulus Type 1 - Rigids, 2 in/min	ASTM D 638	540,000 - 700,000	psi
	Tensile Elongation at Break Type 1 - Rigids, 2 in/min	ASTM D 638	0 – 10	%
	Flexural Strength Procedure B	ASTM D 790	13,500 – 16,000	psi
	Flexural Modulus	ASTM D 790	500,000 – 600,000	psi
	Izod, Impact Strength Method A	ASTM D 256	0.7 – 2.6	ft-lb/in

4.1.3	(c) <u>Thermal Properties</u>	<u>Test Method</u>	<u>Value</u>	<u>Units</u>
	Deflection Temperature Annealed, 264 psi	ASTM D 648	164 - 171	deg. F
	UL Flammability V-0, All Colors	UL 94	Must Comply	N/A

4.2 Dimensions

4.2.1 Plate I. Mounting bracket design shall comply with critical dimensions as specified.

4.2.2 Plate II. Mounting bracket design shall comply with critical dimensions as specified.

4.3 Mounting brackets shall be of such a design that when properly installed, pipe damage does not occur and water hammer vibration is dampened. A secure connection to the wall of the prefabricated, precast or built-up shower/tub must also be achieved.

5. TESTING REQUIREMENTS

5.1 Hook Test - Copper Pipe Fit

5.1.1 Test Method. Using tubular diameter test gauges with NIST traceable calibration, snap a 0.622" outside diameter gauge into each hook of the mounting bracket provided for the cold water, shower and hot water supply lines. Attempt to remove the tubular test gauge from the mounting bracket by hand without resistance. Remove the test gauge and examine the mounting bracket for evidence of fractures. Repeat the process using a 0.628" outside diameter test gauge.

5.1.2 Test Results. The hooks of the mounting bracket shall show no signs of fracture when the tubular test gauges are snapped into place. The hooks shall also lock firmly around the test gauges in such a manner that the gauges cannot be freed from the hook by hand without resistance.

5.1 Bracket Load Test

5.1.1 Attach bracket in accordance with the manufacturer's instructions with the mixing valve and copper lines in their simulated installed positions. Secure the loose ends of the copper pipe to support fixtures to ensure rigidity of the copper tree assembly for test purposes. See Figure 1. Gradually apply a downward static load of 150 lbf (667 N) to the single handle tub/shower valve. Weight should be applied in 5 to 50 lbf (22 to 222 N) increments until 150 lbf (667 N) is reached. Keep the 150 lbf load applied for 5 minutes.