



# GLOBAL PROPERTY INSPECTIONS™ TECHNICAL BULLETINS

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## TOPIC: Air Admittance Valves

Air admittance valves (AAVs) are pressure-activated, one-way mechanical vents, used in a plumbing system to eliminate the need for conventional pipe venting and roof penetrations. A discharge of wastewater causes the AAV to open, releasing the vacuum and allowing air to enter plumbing vent pipe for proper drainage. Otherwise, the valve remains closed, preventing the escape of sewer gas and maintaining the trap seal. Using AAVs can significantly reduce the amount of venting materials needed in a plumbing system, increase plumbing labor efficiency, allow greater flexibility in the layout of plumbing fixtures, and reduce long-term maintenance problems associated with conventional vent stack roofing penetrations.

Standard plumbing systems use water trap seals to perform the critical function of preventing sewer gas from emanating into living areas, with fresh air pipe venting commonly used to prevent siphoning of traps. Although this method is simple and reliable, it requires each plumbing fixture to have a lateral return vent that passes through wall studs to a central stack, or to have its own vertical vent that passes through the wall, ceiling, attic, and roof. Air Admittance Valves are mechanical devices designed to maintain trap seals without the need for additional vent piping. They are one-way valves that open only under negative pressure (created when a toilet is flushed or a drain stopper is opened). When the water flow stops, gravity closes the valve, preventing the escape of sewer gasses under conditions of equal or positive pressure.

AAVs are typically made from polyvinyl chloride (PVC) plastic materials with ethylene propylene diene monomer (EPDM) rubber valve diaphragms. Valves come in two sizes: one for fixture venting and a larger size for system venting. The valves fit standard diameter pipes, ranging from 1-1/4 to 4 inches. Screening protects the valves from foreign objects and vermin. ASSE (American Society of Sanitary Engineers) standards require that AAVs be tested to reliably open and close a minimum of 500,000 times, (estimated to be at least 30 years of use) with no emanation of sewer gas. Some manufacturers claim their units are tested for up to 1.5 million cycles, or at least 80 years of use. Air Admittance Valves have been effectively used in Europe for more than two decades. U.S. manufacturers offer warranties that range from 20 years to lifetime.

An air admittance valve's ability to breathe is measured in Drainage Fixture Units or DFUs. The higher the DFU rating on the valve, the greater amount of air that can enter the DWV system. DFU loads are assigned to plumbing fixtures dependent on the volume rate of discharge, the duration of operation and the time between operations. Common fixture load ratings are shown in the table on the back of this page.

To ensure proper breathing capability, determine all fixtures to be vented and calculate the total DFU load, then select the appropriate type of air admittance valve for the application.

**Example:** *In a house with a laundry room and bathroom sharing a common wall, the DFU load would total nine. Five for the bathroom, three for the washing machine and one for the laundry tub. The 20 DFU Sure-Vent® is the right AAV for the job.*

It is acceptable to oversize a Sure-Vent®; however, an undersized Sure-Vent® will not allow the plumbing system to breathe properly.



Photo courtesy of Jeff Gilly, National Property Inspections, Inc. Carmichael, CA

<b>COMMON FIXTURE LOAD RATINGS</b>	
<b>Fixture Applications:</b>	<b>DFU Load</b>
Traditional Public Bathroom Group (Toilet (1.6 gpf), bathtub w/ shower, and sink)	<b>6</b>
Traditional Private Bathroom Group (Toilet (1.6 gpf), bathtub w/ shower, and sink)	<b>5</b>
Public Toilet (1.6 gpf)	<b>4</b>
Private Toilet (1.6 gpf)	<b>3</b>
Washing Machine	<b>3</b>
Bathtub w/ shower	<b>2</b>
Sink & Disposal	<b>2</b>
Dishwasher	<b>2</b>
Shower Stall	<b>2</b>
Sink	<b>1</b>
Drinking Fountain	<b>0.5</b>
<b>Fixtures not listed above:</b>	
Trap size 1-1 1/2"	<b>2</b>
Trap size 2"	<b>3</b>
Trap size 3"	<b>5</b>
Trap size 4"	<b>6</b>

Above information provided by Oatey® Sure Vent® Air Admittance Valves and are not necessarily endorsed by NPI or GPI

**NOTE: NOT ALL JURISDICTIONS ALLOW OR PERMIT THE INSTALLATION OR USAGE OF AIR ADMITTANCE VALVES. ALWAYS CHECK WITH YOUR AUTHORITY HAVING JURISDICTION OR (AHJ) !!!**

**This technical bulletin has been drafted to be general in nature and not technically exhaustive.**