

Water Efficient Shower Heads

June 2008

ASME/CSA Joint Harmonized Task Force

- The Task Force has a goal of setting a more comprehensive set of performance requirements to address the water efficiency characteristics of shower heads

Parameters considered

- Soap/shampoo removal
- Comfort – Impact (force) of shower spray on the body or head
- Reduced flow and energy savings
- Variation of flow with pressure
 - Using pressure compensating flow controls
- Adequate distribution of water over the body
- Loss of temperature as distance from the discharge outlet increases
- Variable volume control and spray patterns
 - Multimode shower heads
- Wetting
- Droplet size

First steps

- There being an urgent need to proceed fairly quickly to conserve energy, it was agreed the T/F would limit the parameters to ones which appeared easier to achieve consensus on, and
- Also provide a starting point for the EPA WaterSense program and others wishing to give guidance on water savings.

Three Parameters Chosen

- Force over a given area
- Flow rate versus pressure correlation
- Wetting

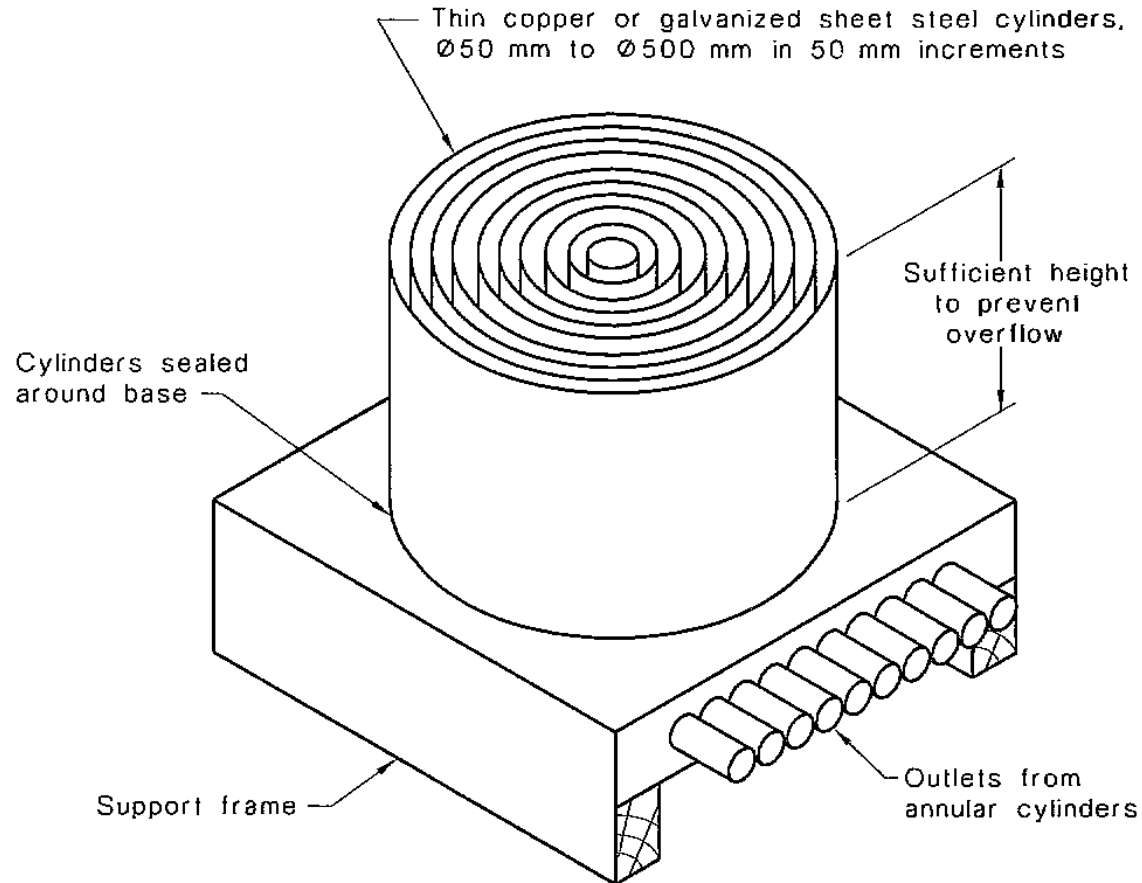
Flow Rate vs. Pressure

- Will measure the flow rate at various pressures to ensure no matter what the building water supply pressure, there will be an adequate flow rate at
 - 20, 40, 60 and 80 psi

Force of spray over a given area

- Will measure the force of the shower spray and measure the distribution of the spray
- First part will measure the force using a force gauge
- Second part will collect water in an annular gauge similar to the one used in the Australian/ New Zealand standard
- Both force and distribution of the spray need to meet minimum requirements to pass

Annular Grid (Ref: AS/NZS 3662:2005).

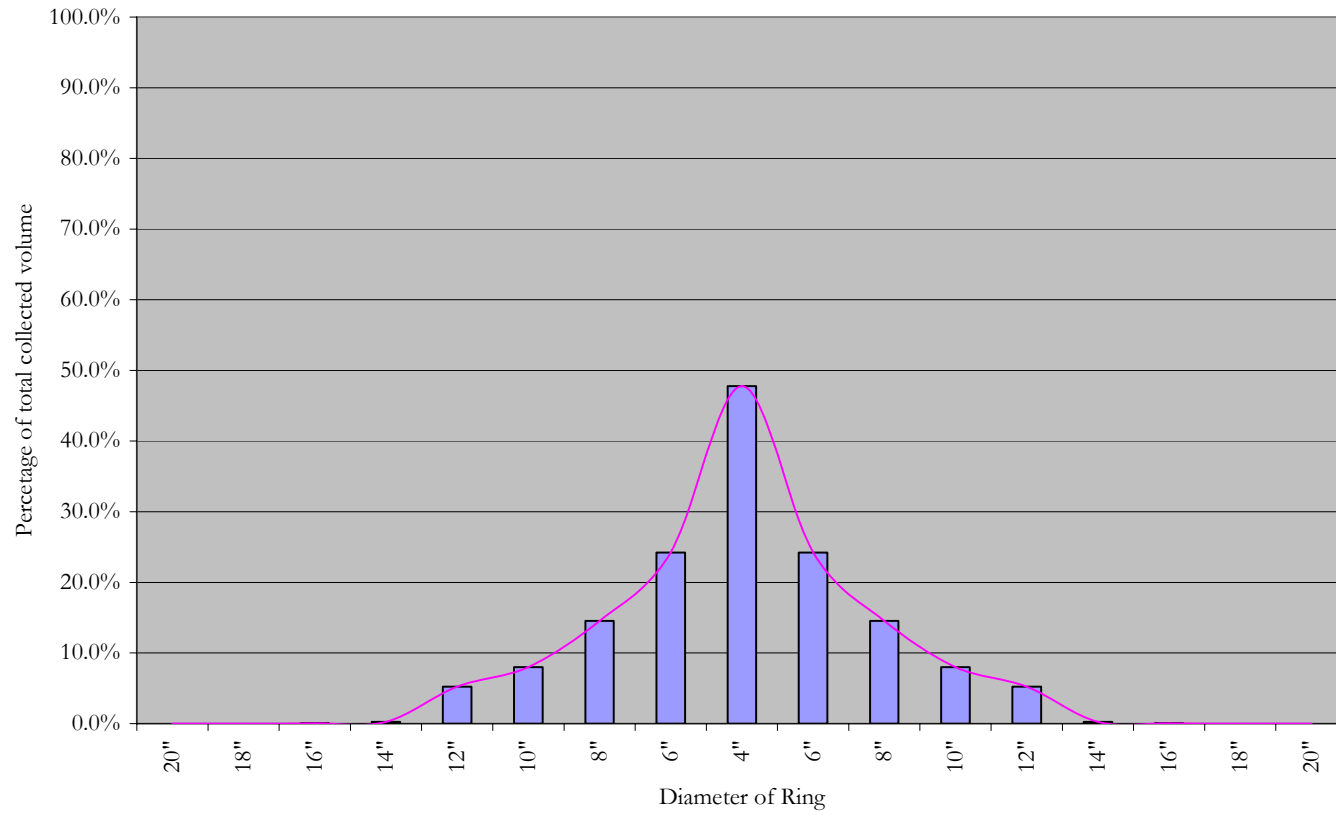


NOTE: Cylinders with wall thickness in excess of 1 mm should be bevelled inwards to relevant cylinder.

FIGURE C1 TYPICAL ANNULAR GAUGE

Typical Distribution of Spray

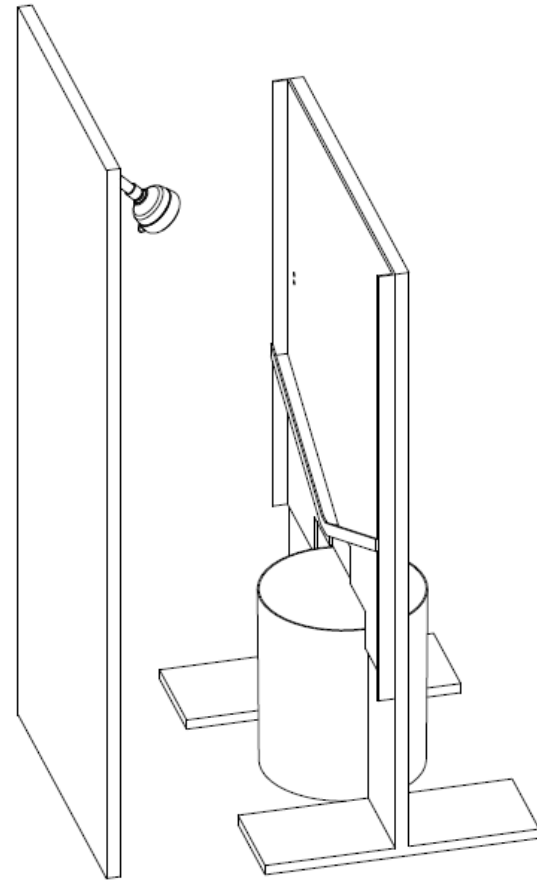
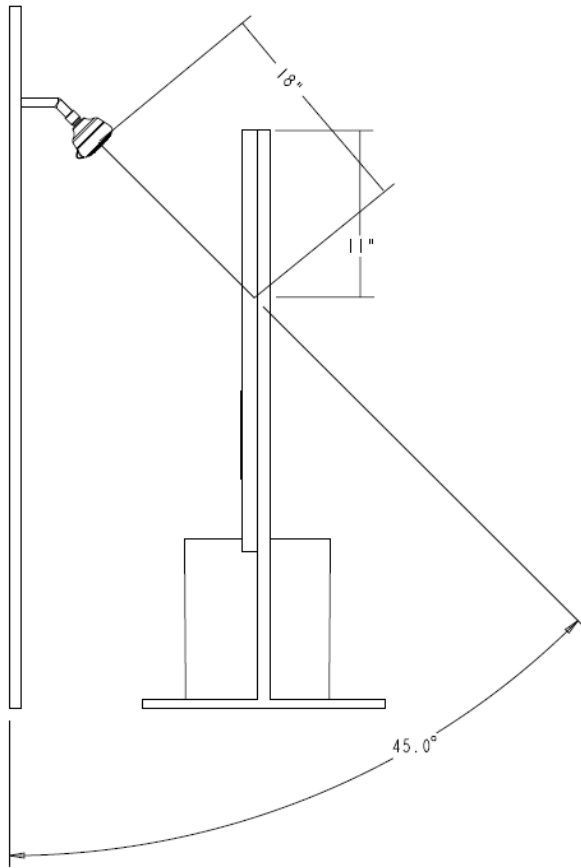
Showerhead Z - 2.5 GPM



Wetting

- Will measure the amount of water that sticks to a specific target.
- The material used for the impact surface might represent a human body, but using a sheet of acrylic or ABS may prove suitable if correlation studies are done.

Wetting Characteristics



Compliance

- A shower is a very personal thing and it will be very difficult to decide a baseline of minimum criteria that will gain consensus
- Some like soft flows, others forceful massage type ones
- At least one mode shall meet all criteria
- All modes must meet the maximum flow rate

Research

- At present, initial testing is taking place to determine the viability of these tests
- Once verified it is proposed to seek research funding for a third party to carry out tests on a variety of product
- Marketing research also planned to correlate testing criteria to actual consumer feedback
- Resulting data will guide the Task Force to appropriate requirements for water efficient shower head criteria

Flow Rate Reduction

- There are concerns with reducing the flow rate of shower heads
- Data shows that temperature variation becomes an issue when lower flow shower heads are used with certain mixing valves
- Codes mandated automatic compensating valves in the late '80's
- They compensate for incoming pressure variations or outgoing temperatures
- However at lower flow rates this compensation may be compromised

Compensating Valve Standard

Requirements for compensating valves are also under review

Present test methods qualify the temperature variation of a valve at a flow rate of 2.5 gpm

With water utilities recommending 2.0 gpm shower heads or even lower flow rates, to conserve water, the potential for scalding and thermal shock will be increased

Tests at other flow rates need to be included in the valve standard