

Planning & Specification - Hydraulic Performance

QuARTz by ACO bathroom drainage systems are compact enough to be encased neatly in a bathroom's mortar screed bed, beneath the tiles. These systems have integral outlets for a connection of either DN50 or DN100 pipe.

Water containment and drainage plays a vital role in the overall waterproofing of a bathroom. Critical elements are the waterproofing, gradient of the shower floor, size of the waste outlet and the design of the shower screen.

AS3740: Waterproofing of wet areas within residential buildings recommends falls as small as 1:60 for the shower area and up to 1:100 for outer bathroom areas. The drainage and tiling operations must be integrated neatly within these floor gradients.

AS/NZS3500: Plumbing and Drainage requires a minimum DN40 connection for showers. The common industry standard however is DN50, allowing for greater discharge capacities. In some applications, governed by the standard, bathrooms have shower fixtures that may not require foul air traps. Either way, they discharge directly into the underground pipe, which is directed into the bathroom's trapped central floor waste.



Installation against the wall

Outlet flow rate up to 0.6 l/s based on floor grades with 5mm head of water.



Installation at the entrance

Outlet flow rate up to 0.42 l/s based on no water accumulation.

Hydraulic performance

Grates and channel outlets are necessary water capture and plumbing elements, but may have some restriction on the water flow into the drainage pipe, particularly if debris (scum, hair etc.) is present. Using a debris strainer will reduce debris induced flow restriction. The efficiency of a shower's linear drain or floor waste is critical, particularly for level threshold drainage.


The flow value for a 50mm outlet varies depending upon the head of water (water accumulation) above the grate. In the case of linear drains, a head of water is not typical in practice, due to shallower floor grades. This is different from shower floor wastes, where water can pond due to the 'basin' profile of the shower recess.

Flow values without any head of water (i.e. 0mm) should be adopted when linear drains are placed around the perimeter of the shower and no shower hob/step down is used. If the drain is installed against a wall, there may be a small head of water depending on the shower layout and floor grade. The tables below give results for a 5mm and 15mm head of water, for both linear drains and floor wastes.


A number of custom solutions is available from ACO for high flow rates or showers with multiple showerheads (see Custom ShowerChannel).

When considering hydraulic performance for specific projects, seek professional advice and/or contact ACO for further information.


ShowerChannel – outlet flow rate capacities (l/s)

 Grate	Accumulation (head of water)		
	0mm	5mm	15mm
Channel body only	0.42	0.60	0.73

ShowerChannel – effect of grate on outlet flow rate capacities (l/s)

 Grate	Accumulation (head of water)		
	0mm	5mm	15mm
Wave	0.38	0.54	0.66
Quadrato	0.40	0.57	0.70
Flag	0.40	0.57	0.70
Linéaire*	0.42	0.60	0.73
Tile	0.41	0.59	0.71

ShowerPoint – effect of grate on outlet flow rate capacities (l/s)

 Grate	Accumulation (head of water)	
	5mm	15mm
Wave	1.1	1.3
Quadrato	0.6	1.1
Hawaii	0.9	1.3
Mix	0.8	1.3
Pixel	0.8	1.3



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