THERMOSTATIC MIXING VALVES
(TMVs) EXPLAINED AND INSTALLATION DO'S & DON'TS

FACTSHEET 3

WHAT ARE THEY?

- Thermostatically controlled products that control accurately the temperature of water for showering, bathing and hand-washing.
- They should maintain the pre-selected temperatures even if the water pressures and temperatures vary when other appliances are used.
- Installed and maintained correctly, they can significantly reduce the risk of scalding (Reference Factsheet I).
- Approval of a valve to a recognised approval scheme should ensure its quality and efficacy.
- In the event of cold water supply failure, the thermostatic mixing mechanism will automatically shut down the flow to prevent discharge of dangerously hot water. Similarly, in the event of hot water failure to prevent cold water shock.

HOW DO THEY WORK?

- Hot and cold water enters the valve and is mixed to a temperature pre- selected by the user or installer.
- This is achieved automatically by a thermally sensitive mechanism thermostat or thermister, within the valve that proportions the amount of hot and cold water entering to produce the required blend.
- The mechanism automatically compensates for any variations in supply pressures or temperatures to maintain the pre- selected temperature.

THERMOSTATIC MIXING VALVES HAVE:-

- Temperature control locked or fixed by the facility manager in the case of an underbasin, or group hand washing or group showering mixing valve; or
- Temperature adjustment; or
- Temperature and flow adjustment.

TMVs – CONSIDERATIONS

- Diversity of use - this is the likely number of outlets that are going to be used at any one time. Tables of diversity factors for plumbing situations are available.
- Minimum and maximum flow rates - poor temperature control from a mixing valve may result if the flow rates are outside the maxiumum and minimum recommended for the product. Check manufacturer's technical data for advice.
- Maximum pressure loss ratio - this is the ratio of the hot and cold water pressures at the inlets of a mixing valve whilst flow is taking place; it is calculated by subtracting the pressure loss from the outlet (back pressure) from each inlet pressure. Poor temperature control from the mixing valve may result if the pressure losses across the valve are outside the maximum quoted. Check manufacturer's technical data for advice
- Minimum temperature differential - a thermostatic mixing valve requires a minimum temperature differential between the blend (mixed water) and the hot water. If this temperature difference is too small temperature sensing mechanism will not be able to react quickly to any change in the incoming hot water. Check manufacturer's technical data for advice.

TMVs - RULES AND REGULATIONS

- All TMVs are subject to independent third-party certification to BuildCert TMV schemes.
- BuildCert TMV2 Scheme ensures that valves for domestic properties meet the requirements of BS EN 1111 and/or BS EN 1287 as well as the additional requirements of the BuildCert TMV2 Scheme.
- Valves conforming to the BuildCert TMV2 Scheme Standards can maintain temperature stability at all times and will shut down safely in case of cold water failure to protect the user from scalding.
- BuildCert TMV3 approval is granted if a thermostatic mixing valve complies with the requirements of D 08/HTM-04 (a National Health Service (NHS) specification. A British Standard (BS 7942) which is essentially equivalent to D 08 also exists.
- BuildCert TMV3 approved valves can be used in mixed water installations where the user is a less able member of the household who might not be able to react to a sudden change in water temperature.

TMVs – APPLICATIONS

- Suggested best practice is for TMVs to be installed in all buildings even if there are no specific recommendations or requirements.
- In some building types, legislation and guidance stipulates certain types of valve and installations. The table overleaf summarises the current situation. However, in all cases the relevant authority or controlling body should be consulted for the particular building.

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THERMOSTATIC MIXING VALVES

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ENVIRONMENTS	APPLIANCE	IS A TMV: Required or recommended by legislation or authoritive guidance.	SUGGESTED BEST PRACTICE	VALVE TYPE?	REFERENCE DOCUMENTS
PRIVATE DWELLING	BATH	YES		TMV2	Guidance to Building Regulations
	BASIN		YES	TMV2	
	SHOWER		YES	TMV2	
	BIDET	YES		TMV2	
HOUSING ASSOCIATION DWELLING	BATH	YES		TMV2	Housing Corp Standard (1.2.1.33a), Guidance to Building Regulations
	BASIN		YES	TMV2	
	SHOWER		YES	TMV2	
	BIDET	YES		TMV2	
HOUSING ASSOCIATION DWELLING FOR THE ELDERLY	BATH	YES	YES	TMV2	Housing Corp Standard (1.2.1.58 and 1.2.1.59), Guidance to Building Regulations
	BASIN		YES	TMV2	
	SHOWER	YES	YES	TMV2	
	BIDET	YES	YES	TMV2	
HOTEL	BATH	YES		TMV2	Guidance to the Water Regulations (G18.5), Guidance to Building Regulations
	BASIN		YES	TMV2	
	SHOWER	YES		TMV2	
	BIDET	YES		TMV2	
NHS NURSING HOME	BATH	YES	YES	TMV3	NHS Health Guidance Note, Care Standards Act 2000, Care Homes Regulations 2001, D 08, Guidance to Building Regulations
	BASIN	YES	YES	TMV3	
	SHOWER	YES	YES	TMV3	
	BIDET	YES	YES	TMV3	
PRIVATE NURSING HOME	BATH	YES	YES	TMV3	Guidance to the Water Regulations (G18.6), Care Standards Act 2000, Care Homes Regulations 2001, HSE Care Homes Guidance, Guidance to Building Regulations
	BASIN	YES	YES	TMV3	
	SHOWER	YES	YES	TMV3	
	BIDET	YES	YES	TMV3	
YOUNG PERSONS' CARE HOME	BATH	YES	YES	TMV3	DoH National Minimum Standards Children's homes Regulations, Care Standards Act 2000, Care Homes Regulations 2001, HSE Care Homes Guidance, Guidance to Building Regulations
	BASIN	YES	YES	TMV3	
	SHOWER	YES	YES	TMV3	
	BIDET	YES	YES	TMV3	
SCHOOLS, INCLUDING NURSERY	BATH	YES	YES	TMV2	Building Bulletin 87, 2nd edition, The School Premises Regulations/National minimum care Standards Section 25.8, Guidance to Building Regulations
	BASIN	YES	YES	TMV2	
	SHOWER	YES	YES	TMV2	
	BIDET	YES	YES	TMV2	
SCHOOLS FOR THE SEVERELY DISABLED INCLUDING NURSERY	BATH	YES	YES	TMV3	Building Bulletin 87, 2nd edition, The School Premises Regulations, if residential, Care Standards Act, Guidance to Building Regulations
	BASIN	YES	YES	TMV3	
	SHOWER	YES	YES	TMV3	
	BIDET	YES	YES	TMV3	
NHS HOSPITAL	BATH	YES	YES	TMV3	NHS Health Guidance Note, D 08, Guidance to Building Regulations
	BASIN	YES	YES	TMV3	
	SHOWER	YES	YES	TMV3	
	BIDET	YES	YES	TMV3	
PRIVATE HOSPITAL	BATH	YES	YES	TMV3	Guidance to the Water Regulations (G18.6), Guidance to Building Regulations
	BASIN	YES	YES	TMV3	
	SHOWER	YES	YES	TMV3	
	BIDET	YES	YES	TMV3	

TMVs – INSTALLATION

- Check flow rates, pressures and water temperatures. They must be within the manufacturer's stated limits.
- Most valves can be fitted in any orientation, provided the hot and cold supplies are connected to the appropriate inlets. Since the valves contain temperature sensitive components, avoid soldering near the main valve body.
- Buildcert TMV3 Scheme requires manufacturers to include detailed installation and maintenance instructions for their TMVs. Ensure that these are read and that the installation is carried out in accordance with the manufacturer's guidelines – if in doubt contact the manufacturer for further guidance.

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