

GUIDE TO HOT WATER SYSTEMS & TMVs IN COMMERCIAL BUILDINGS

FACTSHEET 1

Hot water services should be designed and installed in accordance with the Water Supply Regulations 1999 and relevant parts of BS 6700:1997 and BS EN 806-2:2005.

The table below summarises the requirements for hot water storage and distribution and the use of thermostatic mixing valves (TMV).

HOT WATER STORAGE AND DISTRIBUTION TEMPERATURE REQUIREMENTS	REGULATIONS, RECOMMENDATIONS, APPROVED CODES OF PRACTICE AND STANDARDS	THERMOSTATIC MIXING VALVE REQUIREMENTS
Store at +60°C - Distribute at not less than 55°C.	WATER REGULATIONS GUIDE	G18.5 (Page 8.9) terminal fittings of communal showers in schools or public buildings thermostatic mixing valves.
Cross reference to HSE ACOP L8 Temperature requirements.	BS6700: 2006 & BSEN 806-2: 2005 Design, Installation, testing and maintenance of services supplying water for domestic use within buildings and the curtilages.	None specified.
Minimum flow temperature leaving the calorifier/water heater <60°C Cat all times and 55°C at the supply to the furthest draw-off point. The minimum temperature at the return to the calorifier should be 50°C.	DoH Health Technical Memorandum 04-01 The Control of Legionella, hygiene, "Safe" hot water, cold water and drinking water systems. Part A: Design Installation & Testing Part B: Operational Management	Type 1 - A mechanical valve with max temp stop generally meeting requirements of BSEN 1287: 1999 (Low pressure) & BSEN 817:2009 (High Pressure) Type 2 - A thermostatic mixing valve with max temp stop generally meeting requirements of - Low Pressure: BSEN 1287 - High Pressure: BSEN 1111 Type 3 - A thermostatic mixing valve with enhanced thermal performance complying with NHS requirements.
Store at a min 60°C and return at min 50°C	HSE - ACOP L8 The control of Legionella Bacteria in Water Systems.	Type 3 Thermostatic
Hot water storage maintained at more than 60°C distributed hot water at <50°C.	HSE - Health & Safety Care Homes guidance HSG 220.	Type 3 Thermostatic
Hot water storage maintained at more than 60°C distributed hot water at <50°C.	National minimum standard for Children's Homes.	Type 3 Thermostatic
Hot water should be stored at 60°C or above and distributed at a minimum of 50°C.	Building bulletin 87 2nd edition May 2003. Guidelines for environmental design in schools.	Type 3 Thermostatic



HOT WATER CONSUMPTION

Depending on demand and type of building there are generally three ways of meeting hot water consumption need:

- Locally generated
- Centrally generated
- Plate heat exchangers

The following examples are indicative of where the above sources can be used:

- Local generation where there are several satellite toilet areas and hot water is used for hand washing only
- If the project requires large volumes of water for different purposes then a central storage system should be considered
- If the project requires large volumes, has a large energy source available which can react quickly and has limited space for plant then plate heat exchangers should be considered.



THE EXPERTS IN COMMERCIAL SHOWERING & WASHROOM CONTROLS



STORAGE AND CIRCULATION

- Water must be stored at temperatures of 60°C and above.
- It should be circulated at 55°C.
- The hot water storage capacity should be related to the design consumption rate and the recovery rate.
- Total hot water capacity increased by the use of shunt pumps to eradicate temperature stratification.
- System design should minimise deadlegs that allow water to stagnate.

AT POINT OF USE

- Water circulating at 55°C presents a scalding risk to users. TMVs should be installed at the point of use to reduce the water temperature to a safe level.
- Taps that blend water at the point of use can present a scalding risk to vulnerable users as the body of the tap can heat up. Care should be taken to ensure product selection limits this risk.
- Design codes for health buildings require that all draw off points that can be used by patients, etc, have the temperature of hot water limited to a safe level. This also extends to elderly care homes and sheltered dwellings, which are under the responsibility or licenced by the local authority. Other buildings that require consideration are nurseries, schools, and anywhere where there is a “duty of care” by the building owner’s landlord, and/or management. See the table below for specific guidelines.



TABLE 1.0 NHS GUIDANCE FOR SAFE HOT WATER AND DELIVERY DEVICES FROM HTM 04-01

AREA/ACTIVITY	RECOMMENDED TEMPERATURE (°C)	TYPE OF DEVICE (See MES DO8 for explanation of valve types or HTM 04-01: Section 4)
STAFF BASES, WARD AND CONSULTING ROOMS ETC. BASINS INPATIENT, OUT-PATIENT HAND WASH BASINS	41°C	Type 3 Thermostatic
GENERAL AREAS TO WHICH STAFF AND VISITORS HAVE ACCESS	41 °C	Type 2 Thermostatic
PAEDIATRIC BATHS	40°C – to allow for the cold paediatric bath/sink. NB: Paediatric nurses should always use a thermometer	Type 3 Thermostatic
GENERAL BATHS	43 °C	Type 3 Thermostatic
SHOWERS	41°C	Type 3 Thermostatic
ASSISTED BATHS	46°C - to allow for the cold mass of the bath. NB: Nurses should always use a thermometer before immersing patients	Type 3 Thermostatic
HAIR WASH FACILITIES	41°C	Type 3 Thermostatic
BIDETS	38°C	Separate hot and cold taps or combination tap assembly Type 1; no preceding thermostatic
ALL SINKS, KITCHEN. PANTRIES, SLOP SINKS ETC	55°C – minimum required for food hygiene and decontamination	Separate hot and cold taps or combination tap assembly Type 1; no preceeding thermostatic device

* HTM 04-01 currently states 43°C which is not in line with TMV3 and is likely to be corrected'