



**THIS COULD HAVE
BEEN AVOIDED!**

THE DANGERS IN PLUMBING SYSTEMS

DECEMBER 2024

SAFETY

The designer, installer and the owner or operator of an Installation is responsible for the safety of the user.

**If incorrectly designed,
installed and maintained,
plumbing systems can be
hazardous!**



SCALDING/BURNING



VIDEO CREDIT : ADULT SWIM

SCALDING/BURNING

- Unbalanced systems
- One pipe / two pipe systems
- Consideration of thermostatic controllers
- Undersized piping

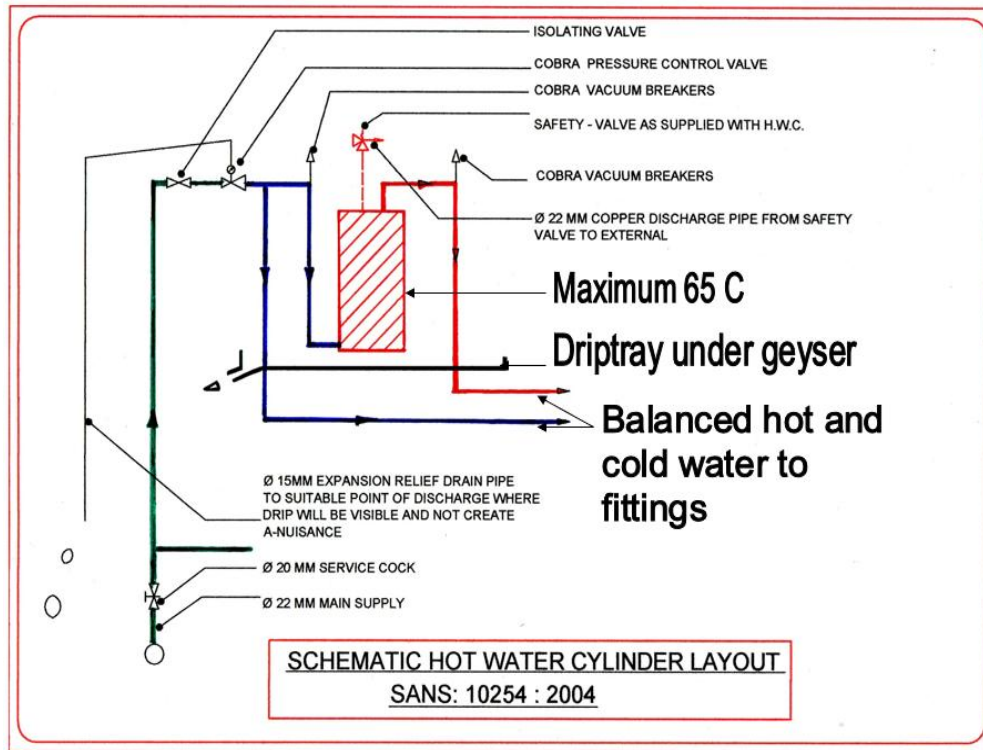
Water temperature Time for a third degree burn to occur

155° F	68° C	1 second
148° F	64° C	2 seconds
140° F	60° C	5 seconds
133° F	56° C	15 seconds
127° F	52° C	1 minute
124° F	51° C	3 minutes
120° F	48° C	5 minutes
100° F	37° C	safe temperature for bathing

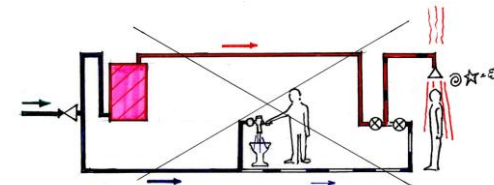


SCALDING/BURNING

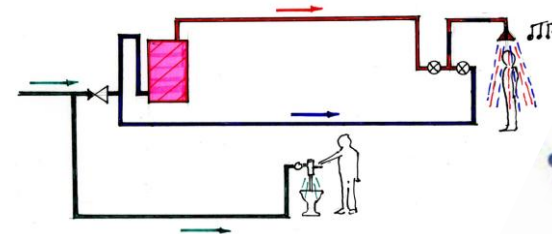
To minimise the chance
of scalding, check the following:



One pipe versus two pipe system:



One pipe system



Two pipe system



DESIGN CONSIDERATIONS

- Where Toilet Flushmasters are used a two-pipe system must be installed.
- Thermostatic mixers should be fitted in critical areas.
- Systems are installed in compliance with **RELEVANT STANDARDS**

BACTERIA



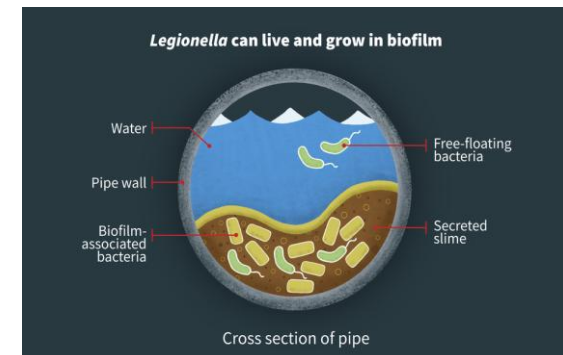
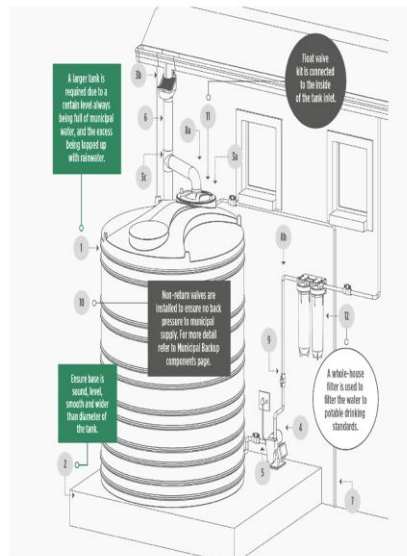
VIDEO CREDIT : 7NEWS AUSTRALIA

BACTERIA



- Rubber components shall not form a source of nutrient for bacterium
- Storage tanks shall be contamination proof and have facilities for cleaning and scouring
- Temperature of cold in storage may not exceed 20° Celsius
- Hot water storage zones shall not be kept in a lukewarm state, 25° to 45° Celsius
- The presence of organic matter in the water as well as final products of metal corrosion shall be kept to a minimum

The bacterium LEGIONELLA PNEUMOPHILA – Infection by inhalation of fine water droplets and will kill

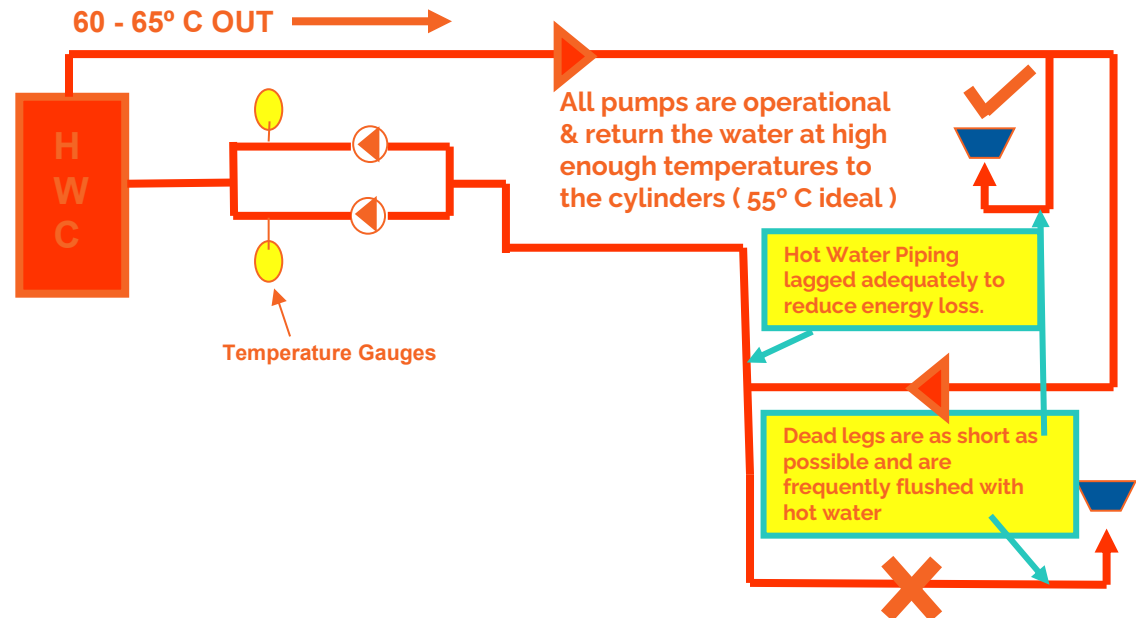


BACTERIA

To minimise bacterial growth in plumbing systems

– here are a few tips:

- Ensure that all fittings and materials are compliant with the relevant standard
- Systems are installed in compliance with the relevant standard and can be flushed periodically
- Water not present for any length of time or stored within the system temperatures 25° to 45° Celsius
- Thermostatic blending of water as close to terminal fittings as possible



BACKFLOW



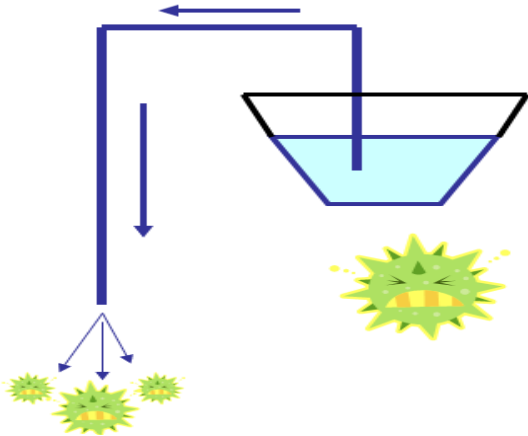
VIDEO CREDIT : BRYAN TOOMEY

BACKFLOW

UNDER THESE NATIONAL REGULATIONS THE DESIGNER OF THE SYSTEM IS RESPONSIBLE FOR THE SAFETY OF THE USER.

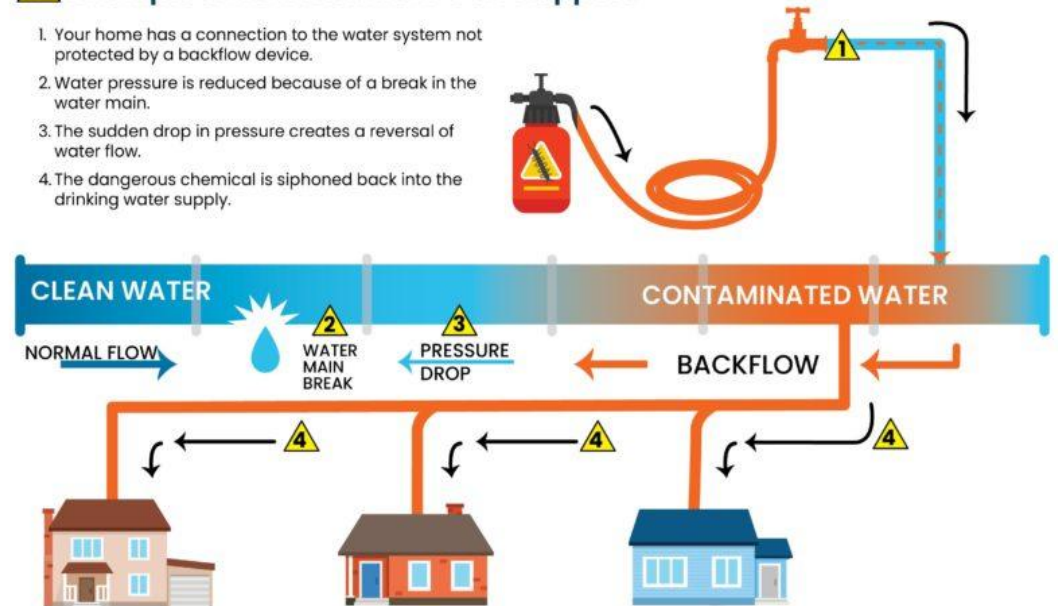
2. BACKFLOW OF CONTAMINATED WATER

- Combined domestic / fire installation
- Type of building
- Unapproved terminal fittings
- Illegal water connections



! Example of How Backflow Can Happen:

1. Your home has a connection to the water system not protected by a backflow device.
2. Water pressure is reduced because of a break in the water main.
3. The sudden drop in pressure creates a reversal of water flow.
4. The dangerous chemical is siphoned back into the drinking water supply.



Back-Pressure is when the water supply is connected to a device that creates pressure, such as a boiler, pressure washer, etc. The pressure created can be greater than the water supply, thereby creating backflow.

Back-Siphonage is when there is a loss of pressure in the water supply. This will cause the water in your facility to flow backwards back into the water supply and/or into other plumbing connections within your facility. This situation can occur when a fire hydrant is opened, when there is a water main break, etc.

BACKFLOW

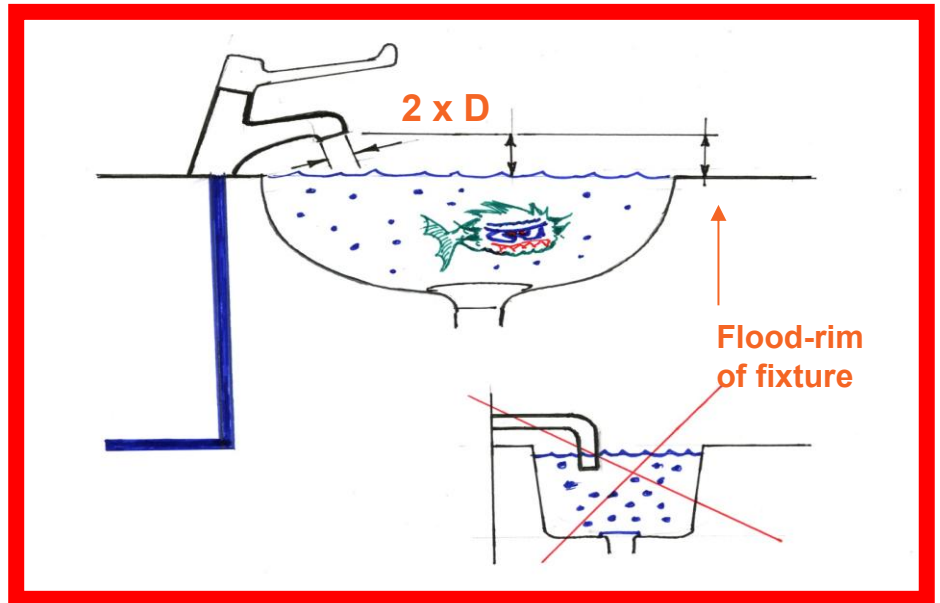
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2. BACKFLOW OF CONTAMINATED WATER

To minimise the risk of backflow of contaminated water:

- Never leave hand showers or tubes lying in baths, basins or receptacles of any kind
- Ensure all terminal fittings and installations are compliant with SANS 10252:1 or relevant legislation
- Ensure Geyser installations are compliant with SANS 10254 or relevant legislation and are fitted with anti-siphon loops and vacuum breakers

Refer to SANS 10252:1.
Instances where backflow
prevention is required



SUDDEN EXPANSION



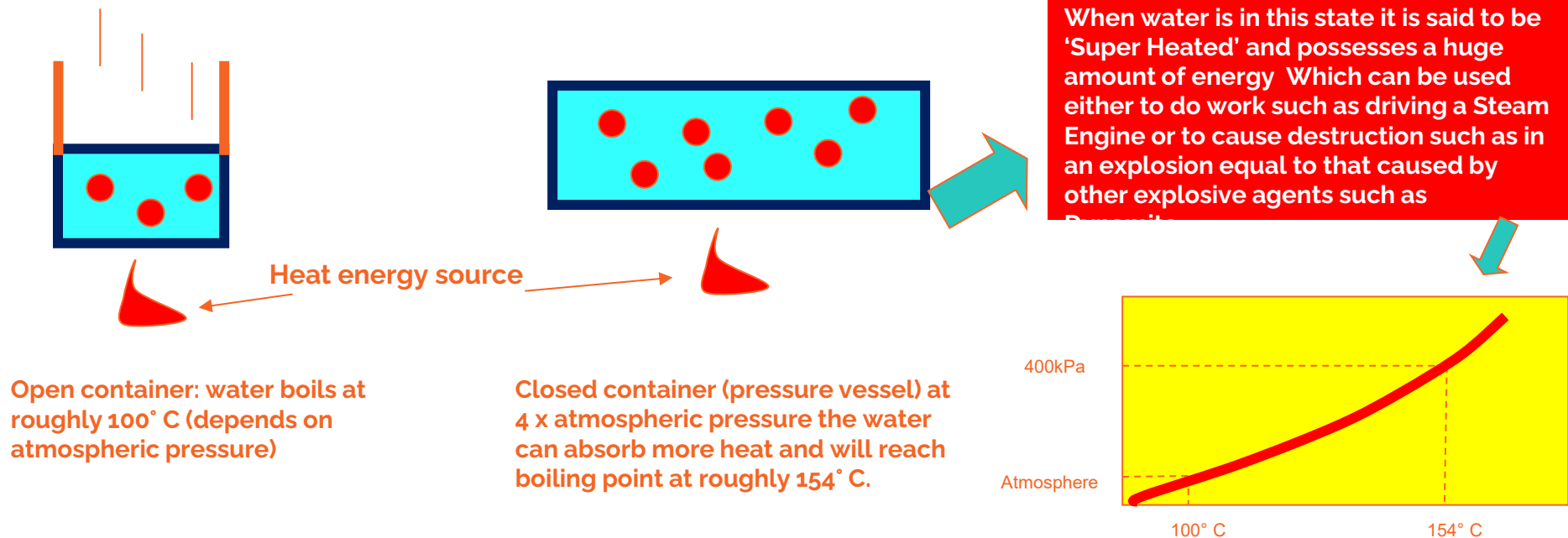
VIDEO CREDIT:
INSTITUTE OF PLUMBING
SOUTH AFRICA

SUDDEN EXPANSION

Hot Water Cylinders must be installed:

- In strict observation of the relevant building code
- With all required safety devices / control valves, drip trays etc
- Correct Installation must be done by qualified plumber and electrician – Not just a plumber / electrician
- Quality of vital components e.g. SANS 198 for valves – SANS 151 for Geysers

**Super heated water is a condition which will exist when water is heated to its boiling point under pressure
i.e more than 1 atmosphere**



CONCLUSION



"And I dream of the vast deserts, the forests, and all of the wilderness of our continent, wild places that we should protect as a precious heritage for our children and for our children's children. We must never forget that it is our duty to protect this environment,"

~ Nelson Mandela