Water Efficient Fittings

Type of fittings

- Flow fittings
  - Basin taps
  - Showers heads
  - Sink faucets
  - Bib taps

*Consumption measured in litres per minute or per second*

\[
\text{Potable Water Use (L)} = \text{No. of Uses} \times \text{Flow (L/s)} \times \text{Duration (s)}
\]
Water Efficient Fittings

- Flush fixtures
  - Water closets
  - Urinals

Consumption measured in litres per flush

Potable Water Use (L) = No. of Uses x Flow (L/flush)
Water usage depends on

- Frequency of usage
- Number of uses
- Volume per use (flush fittings)
- Rate of flow (flow fittings)
- Duration of use (flow fittings)
Flush Fittings

Potable water use = Use x Volume

Example

A person uses a water closet 4 times in a day

Cistern capacity: 9 litres
Consumption per day = 4 x 9 L
= 36 L
Water Efficient Fittings

Water Closets

> 6 L per flush - inefficient
< 6 L per flush – good
< 4.5 L per flush - excellent

Further improvement:
- Use lower capacity fittings
  < 4 L per flush
- Dual flush
  - fittings with full and reduced flush
**Improvements**

Selection of lower cistern capacity water closets

Cistern capacity: 6 L
Consumption per day = 4 x 6 L
= 24 L

Reduction in potable water consumption is given by:

\[
\text{% Reduction of Potable Water} = (1 - \frac{\text{Design Case Consumption}}{\text{Baseline Consumption}}) \times 100\%
\]

\[
\text{% Reduction} = (1 - 24/36) \times 100 = 33\%
\]
Use of dual flush water closets

Example

A person uses a water closet 4 times in a day
- Full flush: 1 time
- Half flush: 3 times

Cistern capacity: 6/3 litres
Consumption per day = 1 x 6 L + 3 x 3 L
= 15 L

Compared to baseline case, reduction = 58%
Flush Fittings

Potable water use = Use \times Volume

Example

A person uses a urinal 3 times in a day

Cistern capacity: 3.8 litres
Consumption per day = 3 \times 3.8 \text{ L}
= 11.4 \text{ L}

Cistern capacity: 1.5 \text{ L}
Consumption per day = 3 \times 1.5 \text{ L}
= 4.5 \text{ L}

% savings = (1 - 4.5/11.5) \times 100
= 60.5\%
Urinals

> 2 L per flush - inefficient
< 2 L per flush – good
< 1 L per flush - excellent

Further improvement:
• Use lower flow fittings
  < 1 L per flush
• Waterless urinal
Use of waterless urinals

Example

A person uses the urinal 3 times in a day

Flushing capacity: 0.2 L/flush
Consumption per day = 3 x 0.2 L
= 0.6 L

Compared to base case, savings = 95%
Flow Fittings

Potable water use = Uses x Flow x Duration

Example

A person uses the wash hand basins 4 times in a day

Flow rate: 0.15 L/s (9 L/min)
Duration of use: 15 seconds
Consumption per day = 4 x 0.15 (L/s) x 15 (s)
= 9 L

% savings = (1 – 6/9) x 100
= 33.3%

Flow rate: 0.1 L/s (6 L/min)
Consumption per day = 4 x 0.1 (L/s) x 15 (s)
= 6 L
Further Improvements

Water Efficient Fittings

Tap Fittings

> 6 L/min – inefficient
< 6 L/min – good
< 4 L/min - excellent

Further improvement:
• Use self-closing taps
• Use sensor taps
Use of self-closing taps

Use of self-closing or sensor taps will reduce duration of water flow

Duration of use: reduce from 15 seconds to 12 seconds

Consumption per day = $4 \times 0.15 \text{ (L/s)} \times 12 \text{ (s)}$

= 7.2 L

Compare to base case, % savings = 20%
Use of self-closing water efficient basin taps

- **Improved Savings**

Flow rate: 0.10 L/s (6 L/min)
Duration of use: 12 seconds
Consumption per day = 4 x 0.10 (L/s) x 12 (s)
= 4.8 L

Compare to base case, % savings = 46.7%
Flow Fittings

Potable water use = Uses x Flow x Duration

Example

A person takes a shower twice a day

Flow rate: 0.217 L/s (13 L/min)
Duration of use: 300 seconds (5 minutes)
Consumption per day = 2 x 0.217 (L/s) x 300 (s)
= 130 L
Shower heads

> 9 L/min – inefficient
< 9 L/min – good
< 6 L/min - excellent
Use of water efficient shower heads

Flow rate: 0.13 L/s (7.8 L/min)
Duration of use: 300 seconds (5 minutes)
Consumption per day = 2 x 0.13 (L/s) x 300 (s)
= 78 L

% savings = (1 – 78/130) x 100
= 40%