LowFlow®

Introduction

LowFlow® is an affordable accessory, made of stainless steel, to reduce water consumption in showers, integrating in one piece a flow controller and the Venturi effect.

The Venturi effect gives volume to the water by mixing it with air, increasing its pressure / speed at the exit of the shower head and thus attenuating the flow rate lowering effect.

When using LowFlow®, we reduce the water consumption without significantly affecting its pressure / speed at the exit of the shower head. The reduction of the flow rate of hot water leads to a reduction of energy used to heat it. The water savings can be up to 60% depending on the water pressure on the network.

Figure 1: LowFlow® (INPI Utility Model No. Nº 11033, 2014)

Applications

- The input pressure should be higher than 4,5 bar;
- Hand held showers and Wall showers where the expected water flow it´s between 8 and 9 L/min.

Why choose LowFlow®?

- Water consumption reduction;
- Energy consumption reduction to heat the water;
- Increase of the water oxygenation level;
- Decrease of chlorine rate in the water (due to forced aeration effect);
- Prevents limestone accumulation on the hose and on the shower head;
- Extension of the lifetime of the hand shower hose (due to the decreasing of inner pressure);
- Soft massage effect associated with the intermittent behaviour of the water jet;
- Low cost, investment return time lower than four months;
- Durability;
- Quick and easy installation.

Package content

1 LowFlow®
1 O - Ring

Figure 2: Package content exposed

Dimensions

Length: 40 mm
Male screw: ½"(DN15)
Female screw: ½"(DN15)

Installation

- **Water flow direction**: the water input it's the female screw and the output it's the male screw, as showed in the figure 3.

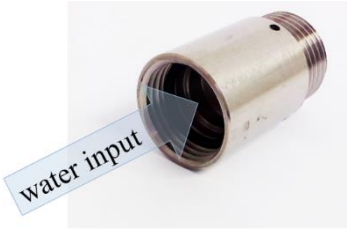

Figure 3: Water input on LowFlow®

- **Variable pressure**: if the water pressure it´s variable and/or superior to 6 bar, it can be installed, in an optional manner, a dynamic flow controller (DFC) placed inside LowFlow®, in order to maintain a constant flow no matter what the pressure is.

Figure 4: Dynamic flow controller installation.

- **In hand held shower heads:** connecting to the faucet (between the faucet and the hand shower hose) (figure 4); this option is the best because it extends the lifetime of the hand shower hose (the water pressure inside the hose drops significantly which avoids limestone accumulation on the hose and on

the shower head (any residual water it´s naturally drained from the device.

Figure 5: LowFlow® installed on the hand held shower hose (connecting it to the faucet).

- **In wall shower** heads connecting to the input of the shower head. (figure 5).

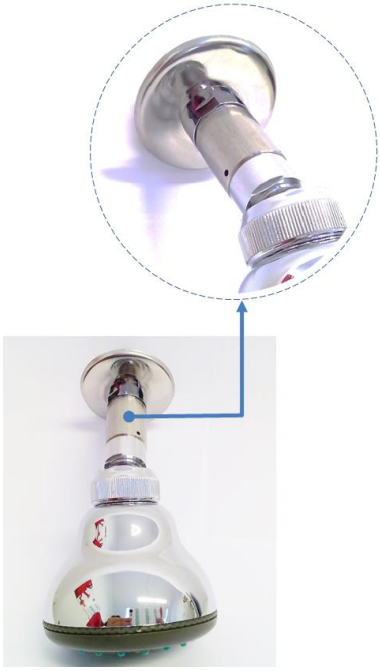

Figure 6: LowFlow® installation at the end of the shower head.

Experimental tests

In the figures 7 and 8 it's showed the water savings at an apartment and at a house after installing LowFlow®.

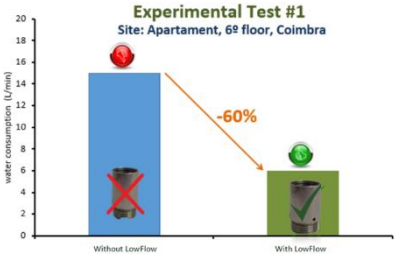

Fig. 7. Water Savings at an apartment.

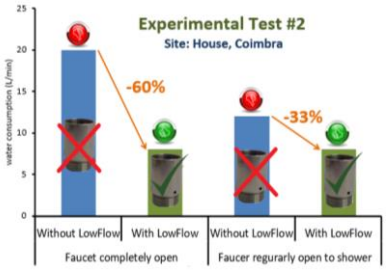

Fig. 8. Water savings at a house

Water savings verification

The water savings can be determined by one of two ways:

1. Using an unscaled bag (or some other container) and a chronometer: measure the time that takes to fill the bag/container with and without LowFlow® ($T_{with\_LowFlow}$ and $T_{without\_LowFlow}$). The water savings (S) it's obtained by:

$$S_{\%} = \frac{T_{with\_LowFlow} - T_{without\_LowFlow}}{T_{without\_LowFlow}} \times 100\%$$

2. Using a scaled measuring bag (or some other container), in litters, and a chronometer: for a given time measure how much water is at the bag/container with and without LowFlow® ($Q_{with\_LowFlow}$ and $Q_{without\_LowFlow}$). The water savings (S) it's obtained by:

$$S_{\%} = \frac{Q_{without\_LowFlow} - Q_{with\_LowFlow}}{Q_{without\_LowFlow}} \times 100\%$$

Warnings

- To ensure the proper functioning of LowFlow®, the shower head must not have any kind of strangulation system and the input pressure should be higher than 4,5 bar;
- **LowFlow® can avoid the proliferation of Legionella bacteria:**
  "Legionella" bacteria has an aerobic behaviour, therefore LowFlow®, when installed at the input of the hand handle shower hose (connecting it to the faucet), decreases significantly the risk of a legionella outbreak because the water on the hose and shower head it's completely drained by the lateral holes after closing the faucet.
  The remaining water evaporates naturally after a few minutes. Notice that after the closing the faucet the environment near the faucet/valve it´s anaerobic, so it´s not suitable to the proliferation of the bacteria.
  Without LowFlow® the probability of legionella proliferation on the water that remains in the hand handle shower hose and the shower head it´s higher because exists contact through the shower head multiple holes, which takes a lot of days to evaporate completely.
  LowFlow® it's easy to remove/disassemble for cleaning and disinfection, which is important when implementing periodic maintenance practices.

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