# Softener Plant

Hardness removal plants with automatic regeneration

## Overview

A water softener removes calcium and magnesium, the hardness that forms scale in boilers, heat exchangers, geysers and RO membranes. Water passes through a bed of cation resin that swaps hardness for sodium.

When the resin is full it is regenerated with salt brine. Arukal supplies softener plants with FRP or MS vessels, multiport or automatic valves, brine tanks and resin, from small commercial units to large industrial plants.

| < 5 mg/L | 0.5 – 50 m³/h | Common salt | Manual / automatic |
|---|---|---|---|
| Outlet hardness | Capacity | Regenerant | Operation |

## Key features

| | |
|---|---|
| **Soft water, protected plant**<br>Prevents scale in boilers, RO and heat exchangers. | **Low running cost**<br>Common salt is the only regenerant. |
| **Automatic regeneration**<br>Timer or meter-initiated regeneration without an operator. | **Sized to your water**<br>Resin volume matched to hardness and daily demand. |
| **Twin-tank option**<br>Continuous soft water while one tank regenerates. | **Resin and service**<br>Fresh resin and servicing from Arukal. |

## Applications

Boiler feed • RO pre-treatment • Hotels and hospitals • Laundries and food plants • Cooling and process water • Textile and dyeing

## How it works

| 1. Service | 2. Backwash | 3. Brine draw | 4. Rinse |
|---|---|---|---|
| Hard water flows down through the resin and leaves softened. | Reverse flow loosens the bed and removes dirt. | Salt brine flows through the resin and restores it. Hardness goes to drain. | Slow and fast rinse remove the salt and return the unit to service. |

## Care and handling

**Salt.** Keep salt in the brine tank above the water level. Use clean, pure salt.
**Regenerate.** Set regeneration on volume or time so that softening never runs out.
**Test.** Check outlet hardness daily with a test kit.

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Technical specifications

**Typical values.** Values are typical for the product family and given for guidance. Exact figures depend on the make and model supplied; ask us for the data sheet of the specific model.

## Plant (typical)

| | |
|---|---|
| Process | Sodium-cycle cation exchange |
| Capacity | 0.5 – 50 m³/h |
| Outlet hardness | < 5 mg/L as $CaCO_3$ (typically < 1 mg/L) |
| Service flow rate | approx. 20 – 30 m/h |
| Resin | Strong acid cation, sodium form |
| Regenerant | NaCl brine 8 – 10 %, approx. 100 – 120 g/L resin |
| Exchange capacity | approx. 40 – 55 kg as $CaCO_3$ per m³ of resin |

## Construction

| | |
|---|---|
| Vessel | FRP or MS epoxy-coated / rubber lined |
| Valve | Multiport (manual or automatic) or diaphragm valves |
| Brine tank | PE or FRP with salt grid |
| Options | Hardness monitor, twin-tank, flow meter |

## Typical plant sizes

| Model | Flow | Vessel | Hardness removed per cycle |
|---|---|---|---|
| SP 1 | 1 m³/h | 18 × 65 in | approx. 80 – 150 g·m³ units |
| SP 3 | 3 m³/h | 24 × 72 in | approx. 350 – 450 g·m³ units |
| SP 10 | 10 m³/h | 36 × 72 in | approx. 1,000 – 1,300 g·m³ units |
| SP 25 | 25 m³/h | 48 × 72 in | approx. 2,500 – 3,300 g·m³ units |

Capacity per cycle depends on raw water hardness and regeneration level. Ask us to size your unit.

## To receive a recommendation, send us:

- Raw water hardness (mg/L as $CaCO_3$) and iron content
- Daily water requirement and peak flow
- Required outlet hardness
- Power, space and salt storage available