

WS-4000 Water Softener

HYUNDAI
WACORTEC



- What is a Water Softener ?

Water Softener is a mechanic device that attaches to and eliminates hard substances to soften the water through a material called ion exchange resin and removes various metal and heavy metal ions and other waste matters in the water

Alkali Water Similar to Na-type Hot Spring Water.(PH 7.5)

- Importance of a Water Softener

When Using
Hard Water

Includes chlorine substances, accelerates various skin infections and aging, causes waterborne diseases

When Using
Soft Water

Removes chlorine and heavy metal substances,
Prevents atopy skin infections, prevents waterborne diseases, such as skin peeling and dandruffs

Characteristics

First filtration system
is added to provide
clearer water

Filter replacement
system is highly effective
in removal of rust stain
and chlorine substances.

HYUNDAI
Water Softener

First SED filter
replacement and
generation is done
simultaneously

Recharge and replacement
of ion exchange resins is
very convenient.
Temperature control is also
easy by the separate use of
warm and cold water.

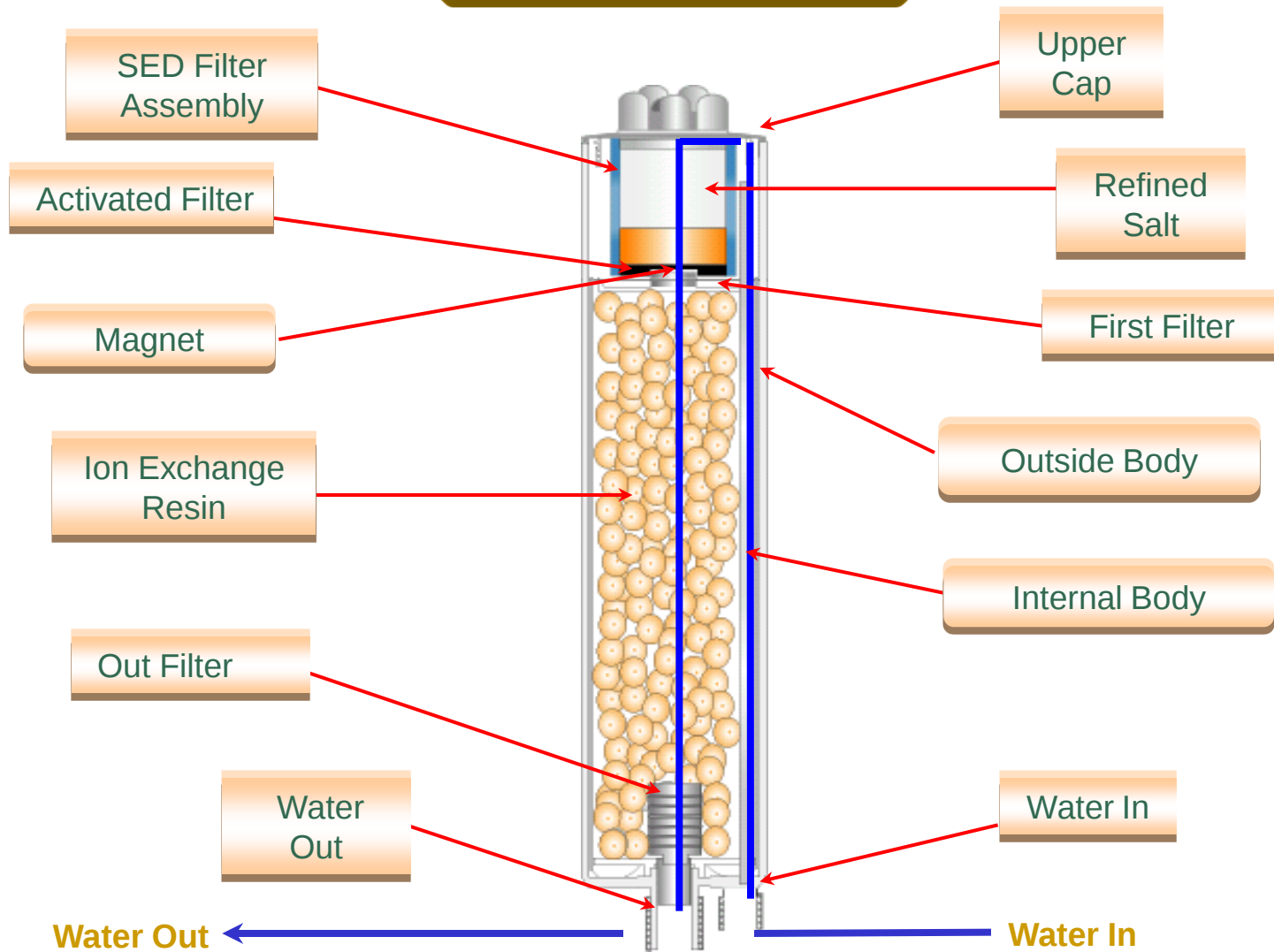
Efficacy of Water Softener



Specifications of Water Softener

Model No.	⇒	WS – 4000
Dimension	⇒	200 (W) × 180 (D) × 600 (H) mm
Capacity	⇒	4-5 ion / cycle (general water supply) The level of contamination may vary according to the water quality in each region.
Filter Colors	⇒	White → Dark Yellow (Existence of rust stain can be identified with naked eyes)
Restoration Cycle	⇒	Replace Filter in One Months (Replace filter in weak water pressure and color change of filter due to clogged filters)
Characteristics	⇒	Inner Case Replacement System, SED Filter Replacement System

Interior Details



Ion Exchange Resin

Makeup and Size of Ion Exchange Resin

Makeup

- High acidic positive ion exchange resin

Shape

- Oval-shaped waterway achieves ion exchange

Types

- Homogeneous resins, heterogeneous resins

Efficiency

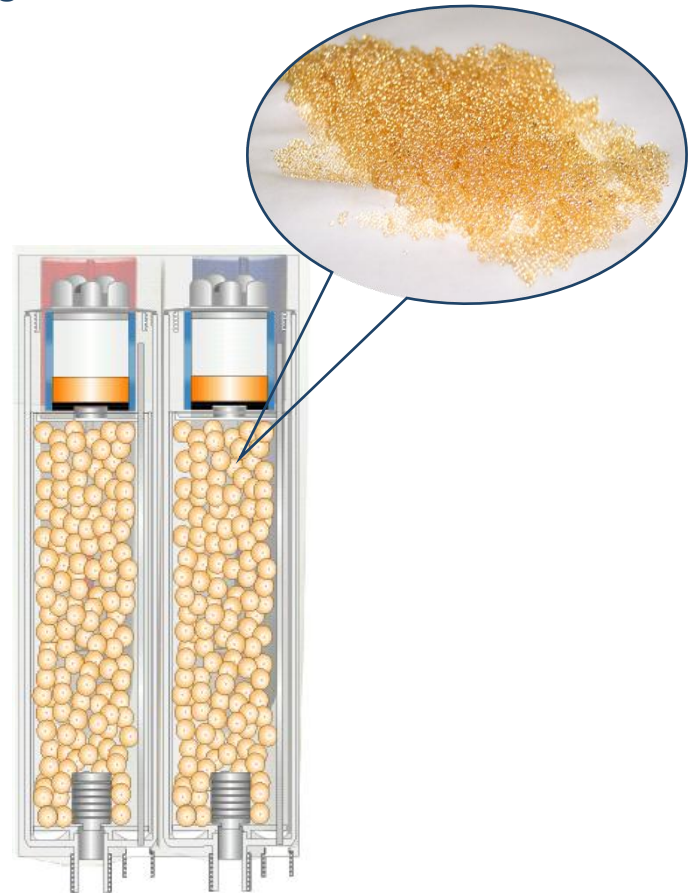
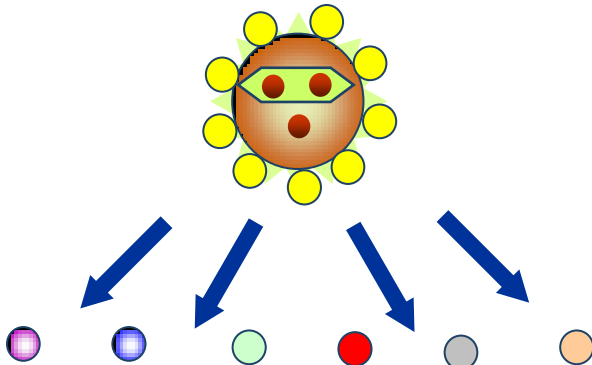
- Homogeneous resins (1.5 times) > heterogeneous resins

Our Ion
Exchange Resin

- C100 ELT (Ion exchange resins for drinking water) – Exported from England

Definition of Ion Exchange Resin

- The insoluble resins of Calcium (Ca²⁺) and magnesium (Mg²⁺) that can be exchanged is converted to Sodium (Na⁺)
- Particle Size: Φ 0.4~0.6 mm
- Weight: 0.6~0.9 (With water: 1.2~1.4)
- Exchange sulfuric acid



Principles of Ion Exchange Resin

1. Ion exchange using sulfuric acid (SO_3^-), the exchanger of the ion exchange resin

2. Water softening process through exchange and regeneration of positive ions following exchange priorities

- $2\text{R-Na} + \text{Ca}^{2+} \rightarrow \text{R}_2\text{-Ca} + 2\text{Na}^+$
- $2\text{R-Na} + \text{Mg}^{2+} \rightarrow \text{R}_2\text{-Mg} + 2\text{Na}^+$

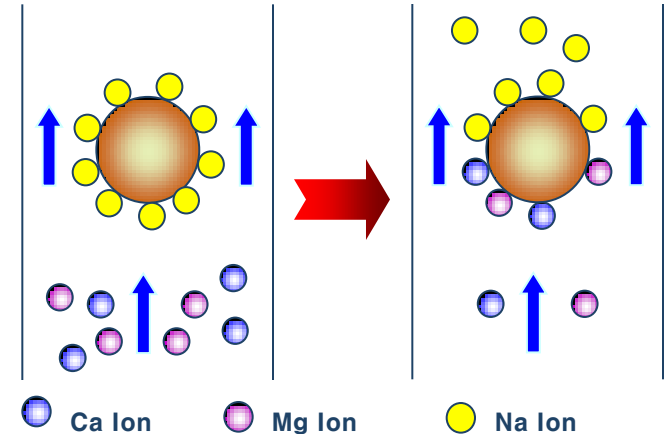
Regeneration

- $\text{R}_2\text{-Ca} + 2\text{Na}^+ \rightarrow 2\text{R-Na} + \text{Ca}^{2+}$
- $\text{R}_2\text{-Mg} + 2\text{Na}^+ \rightarrow \text{R-Na} + \text{Mg}^{2+}$

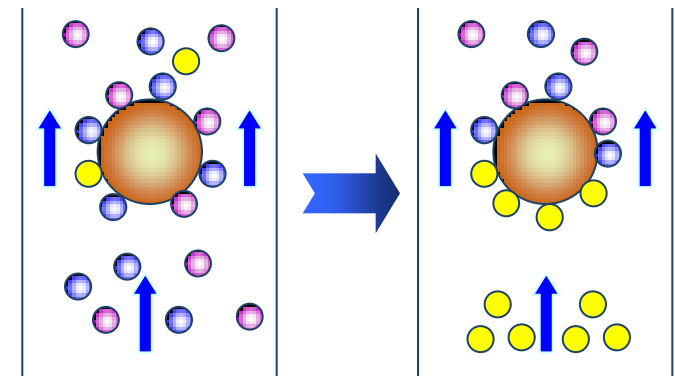
3. Selection of Positive Ions

- $\text{Ba}^{2+} > \text{Pb}^{2+} > \text{Sr}^{2+} > \text{Ca}^{2+} > \text{Ni}^{2+} > \text{Cd}^{2+} > \text{Cu}^{2+} > \text{Co}^{2+} > \text{Zn}^{2+} > \text{Mg}^{2+} > \text{Ag}^+ > \text{Cs}^+ > \text{K}^+ > \text{NH}_4^+ > \text{Na}^+ > \text{H}^+$

Water Softening Process



Regeneration Process



Specifications of Water Filter

Type

Projection Filter

Material

SUS 304

**Activated Carbon
Non-Woven Material**

10 T Thickness

**Ion Exchange
Resin**

Resin for Portable Water 8L
(Cold 4L, Warm 4L)

The above specifications can be changed easily as needed.

Application of New Filters

Lower Part

하 부

Eliminating 2nd
Chlorine

Activated Carbon
Non-Woven Material

Removal of waste
and organic matters

1st
SED Filter

Removal of bacteria
and colon bacillus

Ag-nano

Ion exchange resin
regeneration salt

Refined Salt

상 부

Upper Part

Color Change of Filter

Before



After
(45 days) - Seoul



The color change of filter may vary from region to region.
(Coastal regions cause more color changes and may alter the replacement span.)

Color Change of Filter After 25 Days of Use

Cold Water



Warm Water



Comparison to Competitor's Product

Our Product

Filter replacement also achieves regeneration.
(Filter replacement is each for anyone and takes 5 mi)

The replacement span can be identified.
(Identified when the outside cap is detached)
– color of filter changes

Removes chlorine and other waste matters.
(Addition of 1st Filtration)
- Same as 1st filter of water purifiers

Life span is extended by stable ion exchange resins and replace is easy with separated outside and internal bodies

Use of Composite PP in the main body make it sturdy.

Simple installation and clean designs is good for bathrooms and easy to maintain.

It requires low additional fees and is reliable for the customers.

Competitor's Product

Regeneration is done using salt.
(Regeneration with salt takes 15-30 min)

Replacement span cannot be identified.
(Unidentifiable by the customers)

Only removes about 20% of the chlorine content
(Other water matters are not removed)

The ion exchange resins must be recharged and replaced every 2~3 years and the unit must also be replaced when replacing the resins.

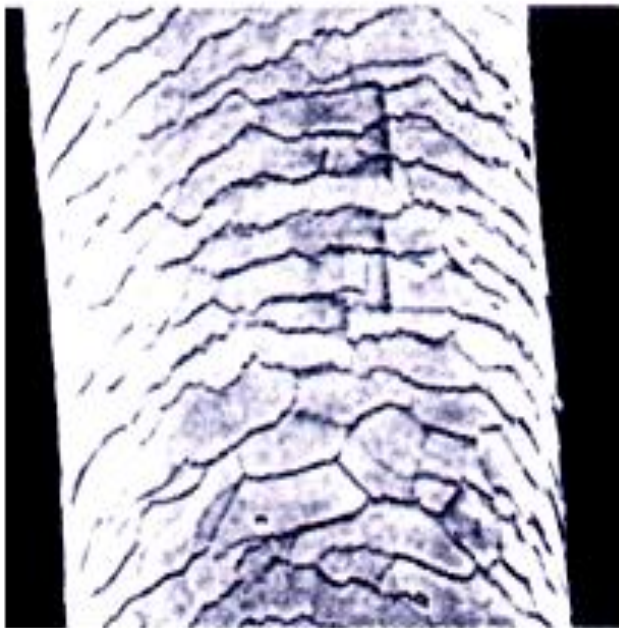
Use of SUS312 or EGI often causes dislocation of parts and rusts.

Installation is complicated and Is not good for appearance.

Requires about 50% additional fees and the customers cannot identify the water quality with naked eyes. (Regeneration and replacement of resins)

Influence of Chlorine Compounds on Hair

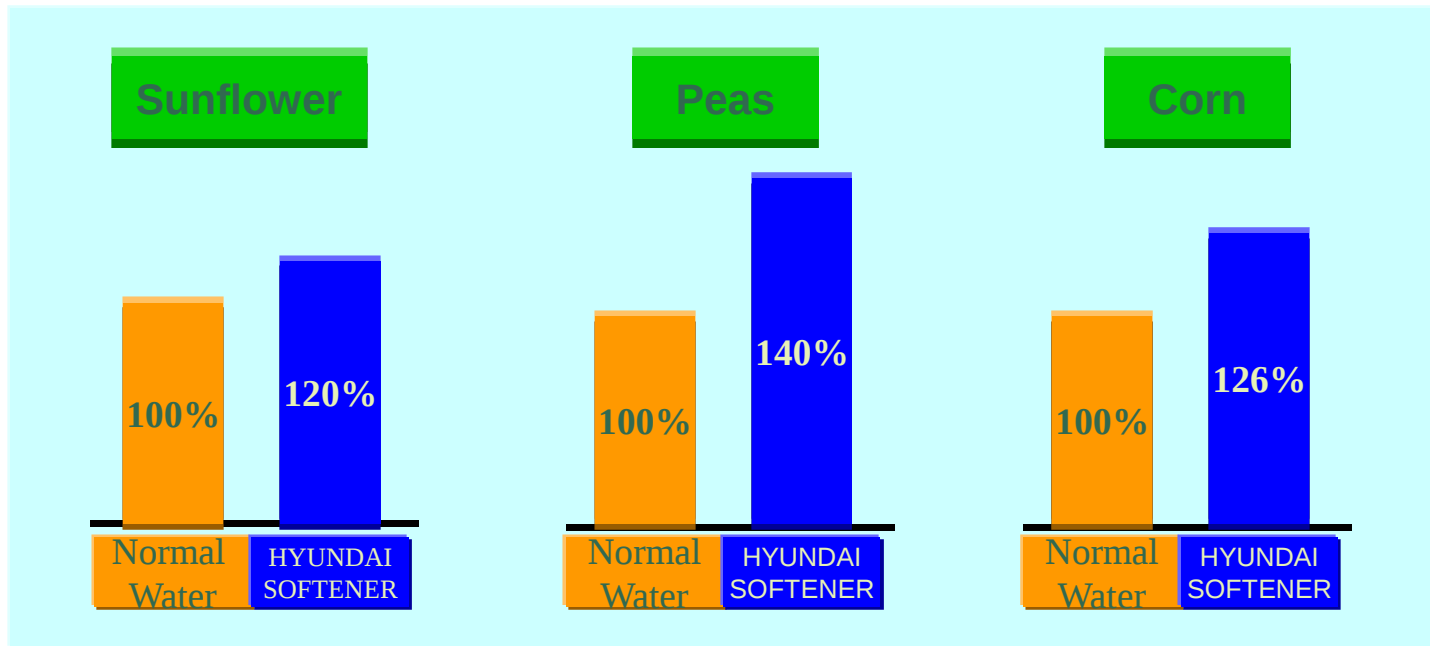
No Chlorine
Compound



Chlorine Compound



Russia Science Academy's Research Report



Plants: Plants that are naturally cultivated in soft water for a year showed excellent life span.

Animals: Spraying HYUNDAI IONIZER on rat feeds reduced the rat's cholesterol level in the hepatic region to 2/3 after 2 weeks and to 2/5 after 90 days. The cholesterol level in blood also reduced.

HYUNDAI WATER SOFTENER SERIES

Model No.: Ws-4000

- SIZE : 200(D) X 180(W) X 600(H)mm
- CAPACITY : 4-5 ion / cycle
- TEMPERATURE : MAX 70C
- RESTORATION CYCLE :1 months (Filter)

