

NO MORE SCALE...



THE
SCALE GUARD  

Non-Chemical
WATER-TREATMENT
SYSTEM

WHY SCALE GUARD ?

As the polluting techno sphere doses more and more salts into our water system, the hardness of water keeps increasing. The bicarbonates of Ca and Mg salts add to the temporary hardness of water and it is this parameter of water which requires Scale Guard. Due to various factors like change in temperature, pH etc., the carbonates of Ca and Mg salts get precipitated and is deposited as scale in the condenser, boilers etc. Thus, to prevent the formation of scale, the Scale Guard is used.

WHAT IS A SCALE GUARD

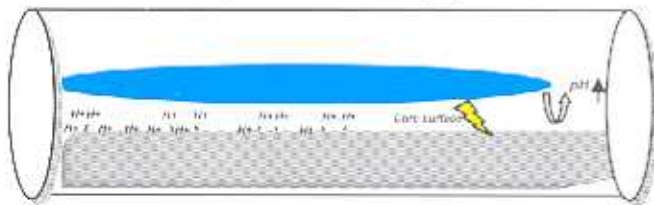
Scale Guard is an on line water treatment system which can be simply fitted in the main header or tapping of the water feed line without any special equipment. Size required can be determine by the reference to the chart of minimum flow rate.

HOW SCALE GUARD WORKS

As water flows through the SCALE GUARD a combination of pressure changes, turbulence and galvanic action causes the dissolved scaling salts to be precipitated as fine (colloidal) particles. The important characteristic of the colloidal particles is the size, they are so small about (0.01 μ to 0.05 μ) that they remain suspended in the water in an interform. The water can thus pass through the system and over the heat exchange surfaces, without depositing lime scale.

WORKING OF SCALE GUARD CAN BE EXPLAINED IN THE FOLLOWING 4 STEPS :

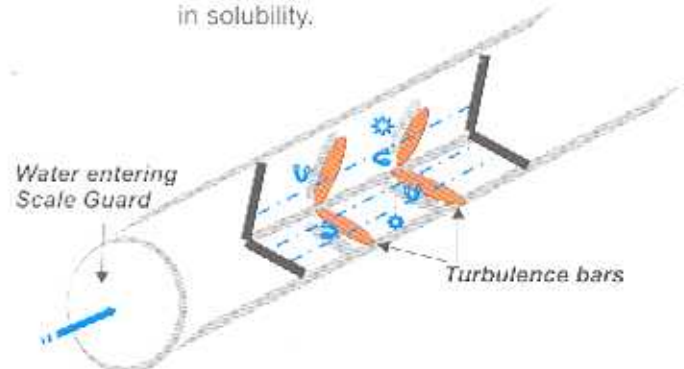
STEP 1 : Adsorption of H⁺ ions by special core.



STEP 2 : Increase in pH value of water as

$$pH = \frac{1}{\text{Log [H+]}}$$

STEP 3 : Precipitation of salts due to reduction in solubility.

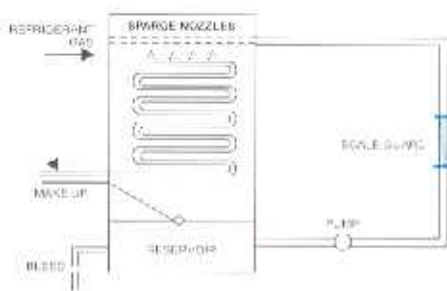


STEP 4 : Precipitation broken into colloidal particles due to turbulence.

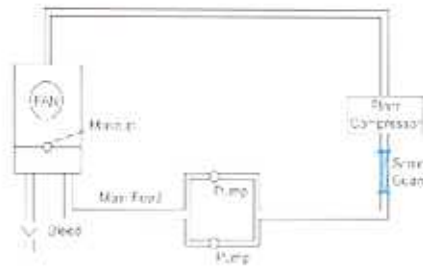
Minimum Flow Rates and Sizes

Minimum Flow Rate Required	G.P.M.	8	14	21	33	55	84	110	201	447	658	1131	1832	2631	3684
	L.P.M.	30	55	80	125	210	320	420	765	1700	2500	4300	6960	10m ³	14m ³ -16m ³
Pipe Size	ins.	3/4	1	1 ^{1/4}	1 ^{1/2}	2	2 ^{1/2}	3	4	5	6	8	10	12	14
	mm.	19	25	32	38	51	64	76	102	127	152	203	254	305	360
Length	ins.	12	12	24	24	24	36	36	36	36	36	36	36	36	36
	mm.	305	305	610	610	610	914	914	914	914	914	914	914	914	914
Weight	lbs.	2.3	3.3	8.5	10.0	15	23	46	76	94	167	232	229	494	565
	Kg.	1.0	1.5	3.9	4.6	6.9	10.4	21	35	43	77	107	138	227	260
Model	SG	02	03	04	05	06	07	08	09	10	11	12	13	14	15

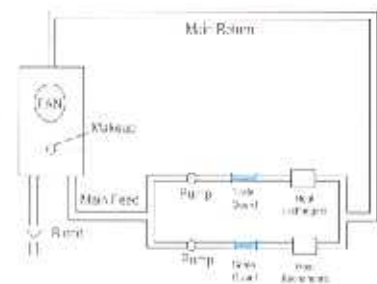
WHAT WILL SCALE GUARD PROTECT



Scale Guard in Evaporating Condensers



Scale Guard in Main Header



Scale Guard in Tapping in Heat Exchangers

REFRIGERATIVE CONDENSERS

Several major cold-store operators and food manufactures are already using Scale Guard to totally replace chemicals or softners on refrigeration equipment.

PLANT COOLING SYSTEM

Scale Guard can be used in any water cooled plant, either recirculating, as above, or single pass, e.g., Compressors, condenser, moulding machines, process cooling water jackets, etc.

CALORIFIERS

Where chemicals cannot be used and softening is too expensive, Scale Guard is the only method of preventing scale. It is thus used extensively in breweries and food processing industries.

ADVANTAGES OF SCALE GUARD

- 1) Prevention of scale and removal of existing scale.
- 2) No extra electricity consumption.
- 3) Saves energy due to no scale formation.
- 4) No chemicals required, hence no recurring cost.
- 5) No corrosion risk.
- 6) No extra manpower required for maintenance.
- 7) No pollution.
- 8) 5 year warranty.
- 9) Comprehensive after sale service.

APPLICATIONS

- 1) Air conditioning plants
- 2) Cold storage & refrigeration
- 3) D. G. sets
- 4) Injection moulding machines
- 5) Heat exchangers
- 6) Evaporating condensers
- 7) Di-casting plants
- 8) Compressors
- 9) Vacuum pumps

OUR SERVICE

The SCALE GUARD is backed by a comprehensive after sales service which shall ensure satisfactory performance of the equipment. During the service visits our engineers will check correct use of SCALE GUARD and carry out tests. In between visits, the plant maintenance engineer must continue routine supervision to ensure that the cooling system is functioning properly.

The Scale Guard is backed by a five year warranty if the Scale Guard fails to provide satisfaction. All that is required is for the plant maintenance engineer to follow the simple instructions given.

OPERATING CONDITIONS

SCALE GUARD WILL WORK ONLY WITH THE CORRECT FLOW RATE & BLEED

FLOW RATE

A minimum flow rate is the most critical condition for effective operation.

The minimum flow rate required (to achieve a turbulent flow) is 7 ft. per second over the unit itself. The chart (on page 2) shows the size of unit required to treat a particular flow rate. In order to achieve a satisfactory flow rate it may be necessary to install a unit of smaller diameter than that of the circuit pipe. If the flow rate is too low, the Scale Guard core will itself scale up, thus insulating it and rendering it ineffective.

DISSOLVED SOLIDS

For scaling to be prevented, the concentration of dissolved scaling salts must still be kept under control. In general a maximum TDS level of 3000 PPM is recommended, although higher levels may be found to be satisfactory in certain circumstances. A good bleed on the system is, therefore, essential to counteract the concentration of solids caused by evaporation. Occasional cleaning of cooling tower base tank is also recommended particularly in the first few weeks of operation.

HOW TO EVALUATE SCALE GUARD

- A) The most reliable method of evaluation is to clean and photograph a section of the heat transfer surfaces of the equipment protected when the Scale Guard is fitted and to inspect them as regularly as possible.
- B) There are other methods of evaluation, such as, the measurement of pressure or temperature changes in the cooling water passing through the plant.
- C) Computer simulation from the company after collection of Raw and Recirculating water by the Engineer.

CHEMICAL ADDITIVES

Treatment chemical may react with part of all of the colloidal particles formed by the action of the Scale Guard, thus breaking down the suspension. No chemicals, with the exception of chlorine based algaecides, should be added.

LOCATION

The Scale Guard should be installed after the pump and before equipment in the main feeding to the heat exchange equipment (Detailed installation instructions are available with the instruments or on request.)

MAINTENANCE

The Scale Guard is maintenance free, provided that it has been correctly installed and the simple operating instructions are followed. It may occasionally require cleaning, but check with the company before doing so.