DESCALER & PREVENTION

Treatment Method for existing scaled surfaces like inside of piping, tubes, Heaters, boilers, sump wall etc.

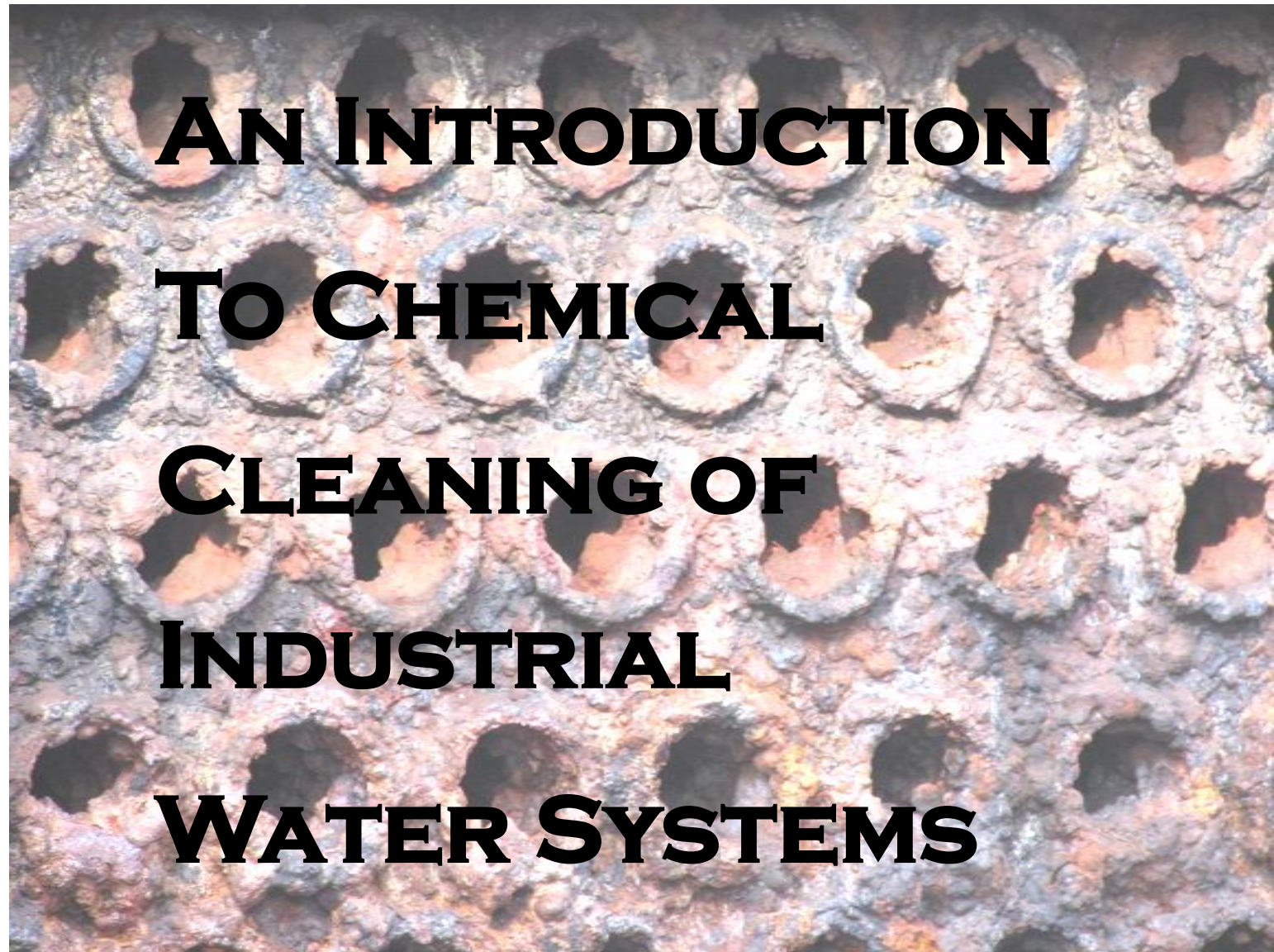## By Deepak Chopra

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An Introduction To Chemical Cleaning of Industrial Water Systems

Heavy Duty
Instant Descaling Compound
It is a
Very Special blend of
I-SOFT Wetting Agent and
Color Indication

Description:

I-SOFT® softens the Scale and the Wetting agent enhances the action of the green acid in removing deposits on surfaces action cleaning properties. The **red color** indicator provides an optical control for the determining whether the strength of the **I-SOFT® DESCALER** solution is adequate for effective and efficient cleaning.

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Reason For Cleaning:

Maintenance of an effective water treatment system is essential to minimize scale and corrosion problems in all industrial systems; however, scale and many other deposits that is already formed will require **REMEDIAL CLEANING** (descaling).

If not removed, these scale and built up deposits will impact the safety of operation personnel, interfere with heat transfer and could cause excessive damage and destruction of the equipments and systems.

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Types of DEPOSITS:

The deposits that occur in water systems are mostly inorganic mineral salts and corrosion products. Deposits composition range from very dense crystallite structures to very porous and loosely bound materials to gelatinous slimes. Almost all of the deposits formed from water constituents consist of corrosion products such as chlorides, sulfates, iron and copper oxides, mineral scales or mixture of these materials.

The Deposits those are most hard to clean are silicates, sulfates, phosphates and these deposits could be spongy, porous or relatively hard and glass-like.

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REMEDIAL CLEANING (Descaling)

Cleaning procedure with **I-SOFT® DESCALER** is a **Green Technology** and performs very effective cleaning. **I-SOFT® DESCALER** has largly replaced HCl and H_2SO_4 cleaning process. The selection of **I-SOFT® DESCALER** is the best choice because of its ability to remove or dissolve all kinds of deposits. It's the most cost effective solution and very safe to handle compared to the effect of cleaning on any metals involved.

I-SOFT® DESCALER contains a very special inhibitor that prevents from attacking the base metals while allowing the cleaning process to remove hard scale mixed with anti corrosion products.

I-SOFT DESCALER (ISD)

I-SOFT® DESCALER (ISD) is an odorless, **pink** INSTANT crystalline solid powder that can be easily dissolved in water. This dry INSTANT powder is known as (Scale Removing Compound).

A 5% to 20% solution (2 to 8 kilograms) in approximately 40 liters water [4.4 to 17.6 pounds to approximately 10 gallons of of water] is used for removing hard scale from metal surfaces. All carbonate deposits are easily removed with ISD. Heating the circulation to a temperature in the range of 50°C - 70°C (122°F – 158°F) can fasten the process. **ISD** is more effective on sulfate scales than any other acid like Hydrochloric acid.

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I-SOFT DESCALER (ISD)

Inhibited **ISD**, used at temperatures up to 50°C (122°F), will not corrode galvanized steel. It's used and highly recommended for removing scale in

- ✓ Cooling Towers
- ✓ Evaporative Condensers
- ✓ Pipe lines
- ✓ Commercial buildings
- ✓ Low pressure Boilers
- ✓ High pressure Boilers
- ✓ Heat Exchangers
- ✓ Residential systems

And the biggest advantage **ISD** can be applied to any equipment while it is operating but should be drained from the system after few hours. **I-SOFT® DESCALER** is the safest and fastest way to clean and de-scale.

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METHODS OF REMOVING SCALE

Removing scale may be accomplished by circulating the inhibited **ISD** solution through the equipments or by soaking the equipment in a tank of diluted **ISD**.

HOT RECIRCULATING INHIBITED ISD

1. Fill the equipment or any system (small or big system) coffee machine or power plant boiler with preheated near 50°C - 70°C (122°F - 158°F) with dilute **ISD** solution.

2. Allow the dilute **ISD** solution to remain in system for 1 to 10 hours, depending on amount of scale. Circulate the **ISD** solution for approximately 15 minutes each hour.

3. Try to keep the temperature of the **ISD** solution as described above.

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4. Check and record the **ISD** strength (**Pink** or **Red** color) at least once every hour. When it turns into yellow add more diluted solution of **ISD**.

5. When color remains red for more than two hours, the system is clean.

6. Drain the system by forcing the **ISD** solution out using clean water at 2 to 3 bars (29 to 43.5 psi) of pressure.

7. Fill the system with preheated water and soak at this temperature for 15 minutes. Drain under pressure 2 to 3 bars.

8. Drain and rinse system until the **pH** of the rinse water is between **7.5** to **8.0**. Add sodium hydroxide if pH remains low for long time and re-circulate keeping pH at 8 for 30 minutes.

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Precautions:

❖ Do not allow **I-SOFT® DESCALER (ISD)** solution to remain in system or equipment for more than 24 hours.

❖ Always make sure that equipment room has sufficient ventilation to prevent the accumulation of gases.

Cleaning of Evaporators / Heat Exchangers:

Add **I-SOFT® DESCALER (ISD)** de-scaling compound slowly to the tank of water, stirring if necessary until the desired quantity of **I-SOFT® DESCALER (ISD)** is dissolved. A 5 - 20% solution can be prepared depending on the amount of scale to be removed. The solution may be heated by either the introduction of steam or the use of immersion heater.

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If the system is badly scaled, it may be necessary to discard the cleaning solution and make a fresh batch. Cleaning is complete when the **ISD** strength holds constant for at least one hour as indicated by a steady **Pink**/**Red** color. Cleaning is generally accomplished in 2 – 10 hours.

➢ Drain the cleaning solution and flush the system with clean water. Refill with water and add the required amount of **I-SOFT®** Scale and corrosion inhibitor.

➢ Adjust pH of circulate water to 8 – 8.5.

➢ Circulate for 1 hour and then drain the system.

➢ Inspect the system and return to service.

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PROPERTIES & PACKAGING

TYPICAL PHYSICAL PROPERTIES:

Appearance	Red Instant Powder
Solubility in Water	20% at 16°C (60.8°F)
pH of 10% solution	0.7
Flash Point	N/A

Packaging:

I-SOFT® DESCALER (ISD) is packed in

1 kg, **2 kg** and **5 kg** bags or **60 kg** drums

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Important Features and Benefits

Features	Benefits
Free flowing Instant Powder.	Easy to ship, easy to handle and easy to mix and use.
Contains **Color indicator**, does not require special test apparatus.	Easy determination of solution strength.
Concentrate can be prepared according to the scale deposits.	Reduces cleaning time, very cost effective.
Contains the best corrosion inhibitor I-SOFT.	Avoid any metal attack during cleaning, softens scale, can be used in any applications.
Contains a wetting agent.	Penetrates light, organic film and quick removal of scale.

Problems solved!

Start the system with

✓**FILTERSORB SP3** system (bicarbonate scale prevention)
✓**I-SOFT ON** (Corrosion and bio fouling control)

To avoid Future Problems

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Did you know?

Dosing Phosphates cause scale:

An understanding of the causes and effects of this increasingly common Heat Exchanger problem is crucial for effective treatment.

Though the worse calcium phosphate scale is a newly discovered problem for the Heat Exchangers and cooling tower industry, it has long been recognized in the boiler industry.

➢ **What is it?** *It's… Calcium Phosphate Scale*

What causes scale? (Read more in Part II)

End of Part I

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