

Are you experiencing iron clogged pipes, fittings and pumps?
Have they turned brown/black?
Is the water cloudy, rusty, has an unusual scent or colourised?



The Fe-GON is your solution!
The Fe-GON has been formulated as a remedy to these issues!

Fe-GON

Description

Fe-GON is supplied as a crystalline powder containing a powerful, naturally occurring chemical which will combine with the Iron Oxide deposits to form a solution which can be pumped from the borehole. Fe-GON will not react with or damage any metallic or man-made material generally used in borehole pumps or pumping systems.



The Fe-GON treatment will make your pump seem brand new!

Iron & Manganese in Groundwater

Many boreholes all over the world are contaminated with Iron deposits in one form or another either from conversion of dissolved iron salts from the water or by the action of certain naturally occurring bacteria which thrive in an iron-rich environment.

The contamination will take the form of rust-red deposits which will gradually block pump impellers and waterways, together with any rigid piping within the well system and downstream, causing loss of flow due to reducing bore and increased surface friction. The tell-tale signs will be readily apparent when a pump is lifted from the bore but diminishing flow from the system would suggest that iron fouling could be a problem.

A brown / black colouration to the contaminant will indicate the presence of Manganese Oxide contamination which is similar to Iron Oxide contamination in most respects – and will generally occur in conjunction with it. Manganese will not be mentioned separately hereafter in these notes and all references to Iron and its treatment can be taken as referring to Manganese equally.

Surface Symptoms

If water from the pump appears to be crystal clear yet takes on a brown tinge after standing for a while, it contains dissolved ferrous (Fe^{2+}) salts which are oxidising to the insoluble ferric (Fe^{3+}) form. With less oxygen available below ground this process will be very gradual at the level of the pump but a hard, rusty, layer will slowly build on hard surfaces and start to choke waterways.

Should the water be rusty and cloudy looking on start-up and have an unpleasant smell there will be Iron Related Bacteria at work in the depths. These grow as an orange slime while also oxidising the ferrous salts into ferric solids which will, again, cause acute blockage of the water passages.

Each borehole is, of course, different but many iron affected wells will suffer both direct oxidation & bacteriological contamination to some degree.

Fe-GON is Whisper Pumps solution to these issues!

Safety Precautions

Fe-GON is supplied as a crystalline powder containing an organic acid so should be treated with the suitable caution.

Whilst Fe-GON is in its dry state an operative should ensure they wear a dust mask & close-fitting goggles or helmet-mounted visor together with acid-proof gloves.

Extreme care should be taken to avoid any contamination of other exposed areas of skin, hair or clothing –

...especially in windy conditions. To avoid splashes when re-circulating the freshly prepared solution a waterproof suit and boots should be worn in addition.

Where the borehole is in a very confined space, carbon dioxide released during the Fe-GON reaction could build up to a potentially dangerous level so measures should be taken to artificially ventilate any such enclosed area – air quality should then be monitored continuously.

Site conditions may, of course, impose specific hazards to anyone working at a particular location so personnel should endeavour to ensure that they are cognisant of potential risks at all times. (Whisper Pumps Limited cannot be held responsible for any accident or injury resulting from the misuse of FE-GON products outside the guidance offered in these Instructions for Use - nor for any accident or injury, howsoever caused, not directly related to the use of said products.)

Setting up the Site

Cleaning the borehole can take up to 48 hours depending on the severity of the contamination so an appropriate time slot must be identified beforehand.

The pump should be turned off and isolated electrically before carrying out any modifications to the system. There is no need to remove the pump from the well.

Provision should be made to re-circulate the solution from the wellhead back into the top of the borehole during cleansing rather than discharging by the normal route – this can be by flexible hose from a convenient pipe joint or by purpose-made connection. Any of the normal pipe run incorporated in this circuit will, of course, benefit from the cleansing action of the solution but will need to be flushed out before re use.

At the primary rinsing stage the reaction product will be flushed from the borehole so an effluent tank must be provided to receive this, capable of taking 5 or 6 times the water capacity of the well.

Cleaning the Borehole with Fe-GON

Fe-GON should be fed directly into the bore, either in its dry form or as slurry, and should be allowed half an hour to dissolve as it settles through the water. (See below for the appropriate dosage for each well.) The pump should then be reconnected and run for at least an hour, re-circulating the resulting solution through the wellhead and back into the borehole to ensure all surfaces are treated. The pump can then be turned off and the solution left to act for up to 48 hours – alternately continued recirculation will speed the cleansing action significantly.

Warning

Do not allow the pump to run with no restriction on the outlet as this will cause the motor to overload. To overcome this, restrict the outlet with a valve or similar to create an artificial head.

Fe-GON Dosage

At ambient temperature Fe-GON is most effective when used at about 5% solution so the following dosing guide will give an indication of the quantity required for a range of boreholes : -

Casing Diameter	Litres per metre	Quantity per metre of water
101mm (4")	8	0.33 kG
152mm (6")	18	0.75kG
203mm (8")	32	1.4kG
254mm (10")	50	2.1kG

Example: A 60metre borehole with water resting at 10 metres from the surface will require:

$$50 \times 0.33 = 16.5\text{kG}$$

Rinsing

Primary Rinse: After soaking for 48 hours (by which time reaction will be complete) reconfigure the pipe work to divert most of the water to the effluent tank and re-start the pump.

Run it until all the Fe-GON solution - by now a green turbid liquid - has been flushed and the water runs clear. During this stage it is advisable to maintain a small flow (5%) re-circulating into the well in order to displace the solution standing above the level of the pump –alternately an equivalent supply of fresh water can be used.

Secondary Rinse: Once the water runs clear divert the flow to waste ground or other approved clean water disposal facility and continue to run the pump for two hours.

Neutralization & Disposal / Environmental Impact of Fe-GON

If the correct dosage has been used the Fe-GON treatment should have resulted in an effluent tank full of near-neutral bio-degradable oxalate solution which can be disposed of within the guidelines of the relevant water service company or Environment Agency, as appropriate. Neither FE-GON nor its reaction products will remain within the borehole system in measurable quantities if rinsing instructions are followed correctly.

Problems after Cleaning

- **Recurrence of Contamination:** FE-GON is not a 'Miracle Cure' and the contamination will reappear. Experience will dictate the frequency of treatment necessary to keep the problem in check with a minimum of down-time.
- **Riser Porosity:** Steel risers (& other downstream pipe work) will suffer from corrosion over time and may rust through entirely to cause minor leakage holes –removal of the surrounding oxide layers with Fe-GON will reveal the true severity of the problem and can increase leakage. Care should be taken as severe corrosion could have weakened the steel leading to a danger of losing the pump in the bore.

Cleaning other Systems & Components with Fe-GON

As above, a 5% solution of Fe-GON can be used to clean pipe work or other items such as pump or valve components.



Whisper Pumps
Leen Court
Boughton
Newark
Nottinghamshire
NG22 9ZD

Tel: 01777 871100
Fax: 01777 871624

 /Whisperpumps
 @WhisperpumpsLtd
www.whisperpumps.com