Johnson Screens

A brand of
Aqseptence Group

Nu-Well® Water Well Cleaning and Rehabilitation Chemicals

The Nu-Well Family of NSF Certified Water Well Chemicals are environmentally safe and effective in improving well efficiencies

Water production can be compromised during well drilling and completion operations or due to progressive build-up of biofilm or mineral encrustations during the life of the well. Johnson Screens' Nu-Well Chemicals clear blockages and restore productivity while keeping your water wells at peak efficiency.

Nu-Well chemicals enhance well productivity by increasing water flow and minimizing draw-down in the well. They also lower the lifetime cost of the well operation by reducing pumping power requirements to maintain a high water output and by lowering maintenance and delaying replacement costs. Ultimately, Nu-well chemicals eliminate out-of-water emergencies while increasing the life of the pump and well.

The Nu-Well Chemicals are divided into groups that reflect the most common water well product and chemical applications.

Descale
A complete selection of pelletized, granular and liquid acids for removal of mineral scale and efficient well cleaning.

Dispersant
A unique set of polymers and surfactants for well development, cleaning and rehabilitation can be used on their own or to boost the performance of other Nu-Well Chemicals.

Chlorine
Efficient chemistries that increase the efficiency of chlorination treatments and safe neutralization of chlorine solutions following their removal from the well.

Neutralizer
Product designed to neutralize acidic solutions after treatment safely.

Scan to watch Nu-Well tutorials

Scan the QR code to watch tutorial videos with our water well experts answering questions and explaining how to use the Nu-Well Chemicals.

Johnson Screens' Nu-Well Chemicals are NSF certified and PFAS-free.

NSF®

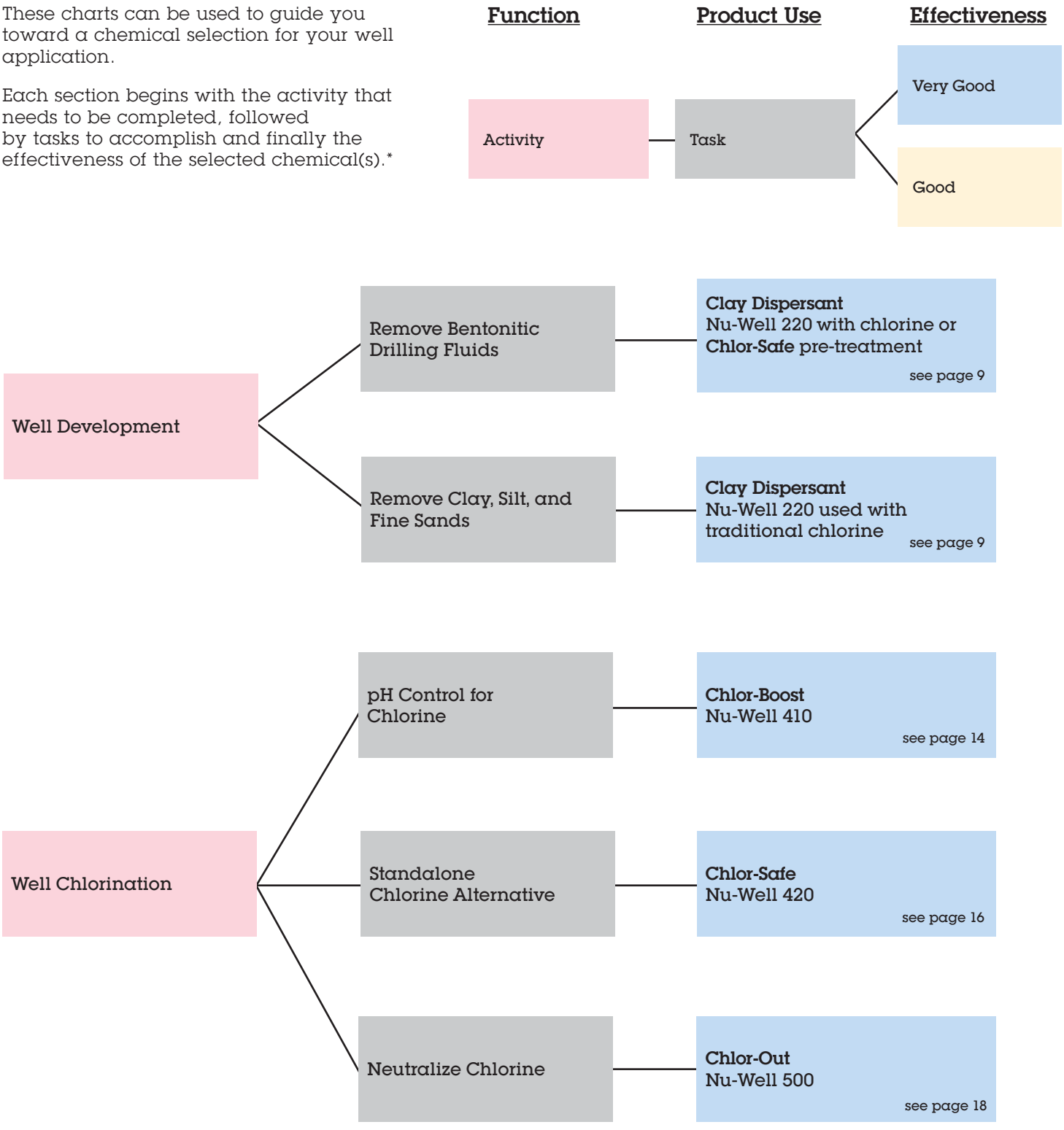
Certified to NSF/ANSI/CAN 60

Nu-Well products used within the well are certified by NSF to the NSF 60 standard, for use in potable water wells and other water filtering facilities. All Nu-Well chemicals are PFAS free.

Nu-Well Preferred Chemical Selection
Well Development, Chlorination and Cleaning

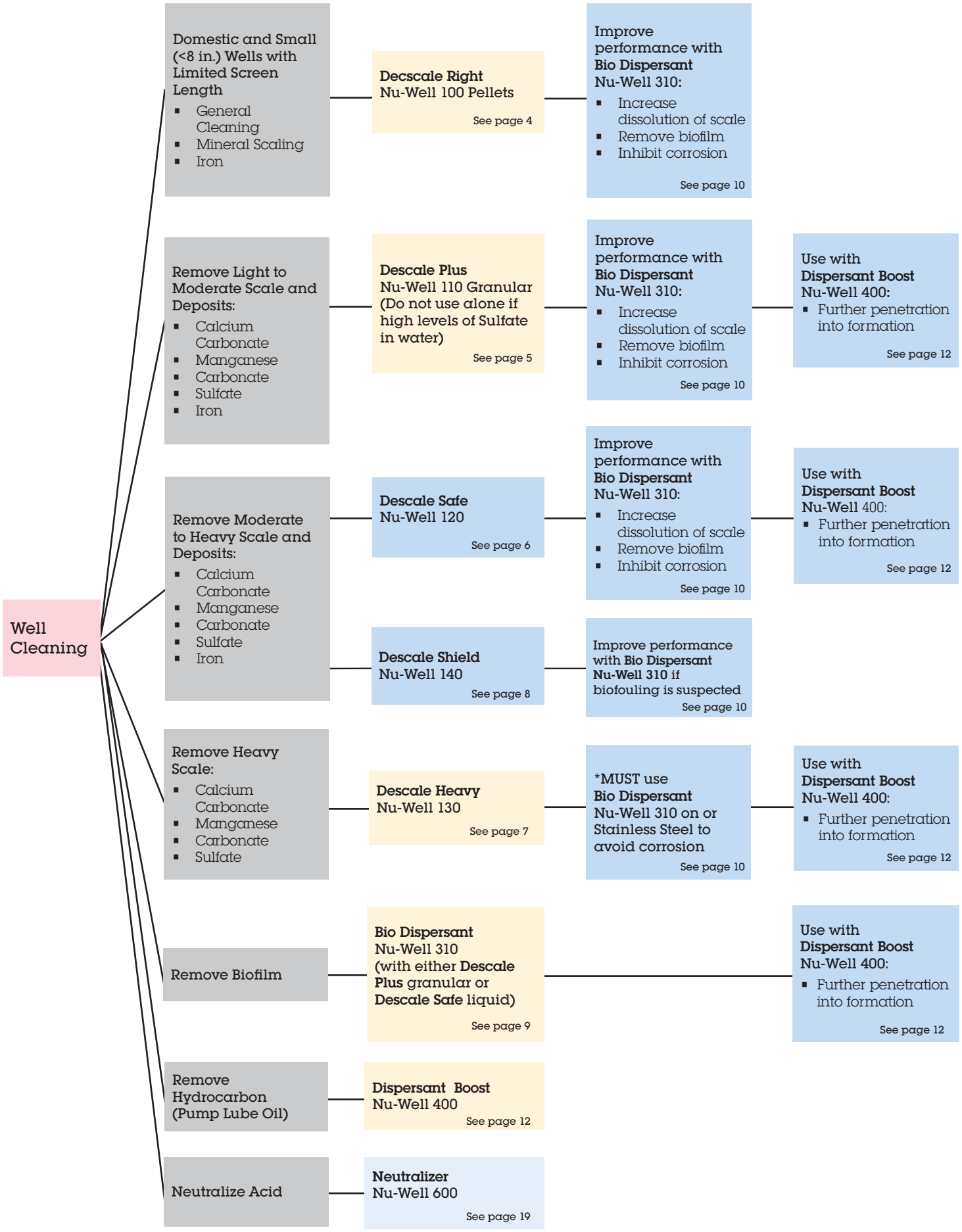
These charts can be used to guide you toward a chemical selection for your well application.

Each section begins with the activity that needs to be completed, followed by tasks to accomplish and finally the effectiveness of the selected chemical(s).*



*Further clarifications (concentration, order of application, handling, etc.) and options are available on the product pages of this brochure. Review each product's SDS prior to use.

Nu-Well Preferred Chemical Selection



Descale Right

Nu-Well 100 Pellets

Description

- Dry, pelletized acid that sinks in water for cleaning wells
- Cleans calcium and magnesium carbonate scale, iron deposits and moderate biological growth
- Can be poured directly into the well without dangerous splashing
- Easy to use and handle
- NSF certified for potable water well use

Application

Descale Right pellets are formulated for pouring directly into the well. The pellet form rapidly falls through the water column, providing concentrated acid cleaning power for the screen at the bottom of the well. The sinking pellets are ideal for small diameter wells with screen lengths of 15 ft. or less. Agitation of the acid in the blocked area will greatly enhance cleaning. The acid solution should remain in contact for a period of 12 to 24 hours, depending on the nature of the blockage. The table provides recommended dosages for general well cleaning. The amount of acid consumed will depend on the degree of mineral scaling in the well. Discharge the acid solution from the well, neutralize on the surface with **Neutralizer NW-600** and dispose in accordance with the appropriate regulations.

Physical properties, shipping and handling

Appearance: Yellow-brown pellet

Density: Approximately 70 lbs./ft.^{3}

Solubility: Approximately 20% by weight @ 68°F (20°C) (approximately 1 lb./gal. of water)

- **Descale Right** Pellets are a strong acid-base and should not be stored with strong alkaline materials or oxidizers
- Dust respirators and goggles should be worn where the possibility of dust or mist exists, use in well-ventilated area, wear protective gloves
- Not regulated as a hazardous material under 49CFR 172.101
- Can be shipped by common carrier, DOT Label CORROSIVE
- Additional physical and handling data are available on the product SDS
- Decomposes at 390° F (200°C)
- Available in 4.5, 9, 45, 70, 450 lbs. containers

Standard Dosage
Descale Right NW-100

Recommended Quantities per 5 ft. Screen Length

Screen Diameter (in.)	Number of 1 gal. jars (9 lbs.)
2	1/2
3	1
4	2
5	3
6	4
8	5

Discharge the acid solution from the well, neutralize on the surface and dispose in accordance with the appropriate regulations.

Descale Plus

Nu-Well 110 Granular Acid

Description

- Dry granular acid blend for cleaning residential, irrigation, commercial and municipal water wells
- Cleans calcium and magnesium carbonate scale, moderate iron deposits
- Contains inhibitor to protect metal surfaces
- Incorporates a penetrant to clean deep into filter pack and formation
- Does not release harmful vapors as does hydrochloric acid
- Easy to use and handle
- NSF certified for potable water well use

Application

Descale Plus is used in well cleaning operations as a granular product mixed in a tank with water to dissolved and then pumped into the well as a liquid. When possible, obtain information on construction and performance history and submit water samples for laboratory analysis before application to determine if dosage modifications are warranted.

1. **Descale Plus** should be mixed into a tank of water equal to 40% of the total treatment volume. The attached table provides the recommended dosage for general well cleaning. In wells with over 100 ft. of screened intervals it is recommended to use 1.5 times the treatment volume to account for the filter pack.
2. The mixture should be placed evenly across the well screens. Placement methods should ensure contact with affected regions at the desired concentration. Agitation of the acid into the plugged area will greatly enhance the effectiveness of the cleaning.
3. The acid solution should remain in contact for a period of 12 to 48 hours, depending on the nature of the plugging. Product has limited use where heavy deposits of gypsum are suspected (add **Bio Dispersant NW-310** in this situation).
4. Monitor pH often during treatment and keep below 3.0 for effective cleaning. If pH rises above 3.0 add additional acid solution of approximately 20% of original volume. The amount of acid consumed will depend on the degree of mineral scaling.
5. Discharge the acid solution from the well, neutralize on the surface with **Neutralizer NW-600** and dispose in accordance with the appropriate regulations.

Physical Properties, Shipping and Handling

Appearance: Yellow-white crystalline powder
Density: Approximately 80 lbs./ft.^{3}
Solubility: Approximately 20% by weight @ 68°F (20°C)
(approximately 1 lb./gal. of water)

- **Descale Plus** is a strong acid-base and should not be stored with strong alkaline material or oxidizers
- Dust respirators and goggles should be worn where the possibility of dust or mist exists, use in well-ventilated area, wear protective gloves
- Not regulated as a hazardous material under 49CFR 172.101
- Can be shipped by common carrier, DOT Label CORROSIVE
- Additional physical and handling data are available on the product SDS
- Decomposes at 390° F (200°C)
- Available in 50 and 80 lbs. containers

Dosage Guide
Descale Plus NW-110

Nominal Well Size		Standard Dosage	
in	mm	lbs/ft	kg/m
2	51	0.1	0.1
3	76	0.2	0.2
4	102	0.3	0.4
5	127	0.4	0.6
6	152	0.6	0.9
8	203	1.1	1.6
10	254	1.7	2.5
12	305	2.5	3.7
14	356	3.4	5.0
16	406	4.4	6.5
18	457	5.6	8.2
20	508	6.9	10.2
22	559	8.3	12.3
24	610	9.9	14.6
30	762	15.5	22.9
36	914	22.3	33.0

Treatment Example

Treat 12 in. well, 180 ft. TD, SWL = 40 ft.

Step 1
Static height = (180 ft - 40 ft) = 140 ft.
Step 2
Amount acid = 140 ft. x 2.5 lbs/ft .= 350 lbs.
Step 3
Mix 350 lbs. **Descale Plus** with water and apply.*

* Better results can be achieved when the total treatment volume of chemical solution is 1.5 to 2 times the static well volume (allowing for penetration into surrounding formation).

Descale Safe

Nu-Well 120 Liquid Acid

Descale Safe is the optimal basic ingredient for many cleaning applications, especially when cleaning scale from older well structures.

Description

Liquid, food grade phosphoric mineral acid effectively removes common mineral deposits (carbonate, iron, manganese, sulfates) found in wells, filter beds, and water system equipment. NSF certified for potable well systems.

A strong liquid acid for use in attacking stubborn mineral scale without risk to stainless steel screens or casings, **Descale Safe** is a chemically clean acid that won't harm the well structure. When combined with **Bio Dispersant NW-310**, **Descale Safe** offers passivation of corrosion impacted areas, prolonging life of older well completions and protecting pumps and tooling.

Application

When possible, obtain information on construction and performance history and submit water samples for laboratory analysis before application to determine if dosage modifications are warranted.

1. **Descale Safe** should be mixed into a tank of water and acid equal to 40% of the total treatment volume. Use the dosage table to calculate the recommended dosage for general well cleaning. In wells with over 100 ft of screened intervals, it is recommended to use 1.5 times the treatment volume to account for the filter pack.
2. The mixture should be placed evenly across the well screens. Placement methods should ensure contact with affected regions at the desired concentration. Agitation of the acid into the plugged area will greatly enhance the effectiveness of the cleaning.
3. The acid solution should remain in contact for a period of 12 to 48 hours, depending on the nature of the plugging.
4. Monitor the pH during the during treatment, keep below 3.0 for effective cleaning. If pH level rises above 3.0, add additional acid solution of approximately 20% of original volume. The amount of acid used will depend on the degree of mineral scaling.
5. Discharge the acid solution from the well, neutralize on the surface with **Neutralizer NW-600** and dispose in accordance with government regulations.

Physical properties, shipping and handling

Appearance: Clear colorless liquid, no odor
Density: 13.2 lbs./gal.
Solubility in water: 100% in water
Freeze point: 26°F (-3°C)
pH (as shipped): Aqueous approximately 1.00 to 2.00
Descale Safe is a strong acid base and does not store well with strong alkaline materials or oxidizers

- Dust respirators and goggles should be worn where possibility of dust or mist exists, use in well-ventilated area, wear protection glasses
- Hazardous Class: 8, UNI 805, PGIII
- Can be shipped ground by common carrier DOT Label CORROSIVE
- Additional physical and handling data are available on the product SDS
- Available in 15, 55 and 275 gal. containers

Dosage Guide
Descale Safe NW-120

Nominal Well Size		Standard Dosage	
in	mm	gal/ft	l/m
2	51	0.01	0.1
3	76	0.02	0.3
4	102	0.04	0.5
5	127	0.07	0.9
6	152	0.1	1.2
8	203	0.2	2.2
10	254	0.3	3.4
12	305	0.4	4.9
14	356	0.5	6.7
16	406	0.7	8.7
18	457	0.9	11.1
20	508	1.1	13.7
22	559	1.3	16.5
24	610	1.6	19.7
26	660	1.9	23.1
30	762	2.5	30.7
34	864	3.2	39.5
36	914	3.6	44.2

Treatment Example

Treat 12 in. well, 180 ft. TD, SWL = 40 ft.

Step 1
Static height = (180 ft. - 40 ft.) = 140 ft.
Step 2
Dosage Value = 0.4 gal./ft. (12 in. well)
Step 3
Volume of **Descale Safe** =
(140 ft. x 0.4 gal./ft.) = 56 gal.

Descale Heavy

Nu-Well 130 Liquid Acid

Description

Descale Heavy is an aggressive acid for use in wells with heavy accumulation of calcium carbonate and calcium sulfate scale. **Descale Heavy** is a NSF certified hydrochloric acid that effectively removes calcium carbonate, calcium sulfate and other mineral deposits found in wells. When combined with **Bio Dispersant NW-310**, **Descale Heavy** offers inhibition of the acid against metals in the well.

Application

When possible, obtain information on construction and performance history and submit water samples for laboratory analysis before application to determine if dosage modifications are warranted.

1. **Descale Heavy** should be mixed into a tank containing a volume of water equal to 40% of the total treatment volume. Use the dosage table to calculate the recommended dosage for general well cleaning. In wells with longer screened intervals over 100 ft it is recommended to use 1.5 times the treatment volume to account for the filter pack.
2. This mixture should be placed evenly across the well screens. Placement methods should ensure contact with affected regions at the desired concentration. Agitation of the acid into the plugged area will greatly enhance the effectiveness of the cleaning.
3. The acid solution should remain in contact for a period of 12 to 48 hours,depending on the nature of the plugging.
4. Monitor the pH during the treatment, keep to below 3.0 for effective cleaning. If pH level rises above 3.0, add additional acid solution of approximately 20% of original volume. The amount of acid used will depend on the degree of mineral scaling.
5. Discharge the acid solution from the well, neutralize on the surface with **Neutralizer NW-600** and dispose in accordance with government regulations.

Physical properties, shipping and handling

Appearance: Clear, slight amber colored liquid
Density: 9.68 lbs./gal.
pH (as shipped): Aqueous approximately 0.25 to 0.5
Melting/Freeze point: -29 °F (-34 °C)
Initial boiling point and boiling range: 107° F (41°C) estimated
Solubility: 100%
Use range: 2 to 12% by volume

- **Descale Heavy** is a strong acid base and does not store well with strong alkaline materials or oxidizers
- Respirators and goggles should be worn where possibility of mist or splash exists,use in well-ventilated area, wear protective gloves
- UN Number: 1789, Hazardous Class: 8, Packing Group II
- Can be shipped ground by common carrier DOT Label CORROSIVE
- Additional physical and handling data are available on the product SDS
- Available in 15 and 55 gal. containers

Dosage Guide
Descale Heavy NW-130

Nominal Well Size		Standard Dosage	
in	mm	gal/ft	l/m
2	51	0.04	0.4
3	76	0.08	1.0
4	102	0.1	1.8
5	127	0.2	2.8
6	152	0.3	4.0
8	203	0.6	7.2
10	254	0.9	11
12	305	1.3	16
14	356	1.8	22
16	406	2.3	29
18	457	2.9	36
20	508	3.6	45
22	559	4.4	54
24	610	5.2	65
26	660	6	76
30	762	8	101
34	864	10	130
36	914	12	146

Treatment Example

Treat 12 in. well, 180 ft. TD, SWL = 40 ft.

Step 1
Static height = (180 ft. - 40 ft.) = 140 ft.
Step 2
Dosage Value = 1.3 gal./ft. (12-in well)
Step 3
Volume of **Descale Heavy** =
140 ft. x 1.3 gal./ft. = 182 gal.

Descale Shield

Nu-Well 140 Liquid Acid

Description

Descale Shield Nu-Well 140 is an NSF-certified synthetic acid with organic and metal inhibitors that is safe to transport and handle and non-damaging to steel well components. **Descale Shield** has additives for deeper penetration into the filter pack and formation and dissolves calcium carbonate scale 15% faster than traditional hydrochloric acid. **Descale Shield** is an environmentally friendly and better alternative to conventional acids commonly used in well rehabilitation and pipeline cleaning.

Application

When possible, obtain information on construction and performance history and submit water samples for laboratory analysis before application to determine if dosage modifications are warranted.

Well Rehabilitation:

1. Proposed treatment volume for Descale Shield can be calculated using measurements from the standing water column (casing) and borehole annulus.
2. Inject the calculated volume of fluid into the well at desired concentration based on the type of fouling and degree to which the well has been impacted. Allow product to work for sufficient amount of time. Mechanical surging of the solution during treatment will help to improve cleaning activity.
3. Following use, actively flush the well until pH and conductivity return to normal levels or until at least twice the volume injected is removed.
4. If necessary, disinfect the well following treatment.
5. Recommended dosage 100 gallons NW-140 per 500 gallons water.

Pipe Cleaning:

1. Product may be used at concentrations up to 100% depending on severity of fouling. Close off or disconnect section of pipe to be cleaned.
2. Drain and fill with NW-140 at desired concentration. It is recommended for effective cleaning to use at no less than 10% dilution strength. Allow product to work for at least 30 minutes or longer as necessary dependent on the ability to surge or agitate the mixture
3. Drain and flush pipes with fresh water checking pH to ensure it returns to normal before reestablishing connections.
4. Recommended dosage: 75 to 100 gallons NW-140 per 500 gallons treatment volume dependent on severity of fouling.

Physical properties, shipping and handling

Appearance: Colorless to yellow colored liquid

Density: 9.59 lbs./gal.

pH (as shipped): 1.6

Melting/Freeze point: -24.9 °F (-31.6 °C)

Initial boiling point: 212° F (100°C) estimated

Solubility: 100% soluble in water

Use range: Use at a rate of 1 to 10% of the cleaning solution

- **Descale Shield** is a strong acid base and does not store well with strong cuastic materials or oxidizers
- Respirators and goggles should be worn where possibility of mist or splash exists, use in well-ventilated area, wear protective gloves
- UN Number: 1760, Corrosive Liquid, Synthetic Acid, Class 8, Packing Group III
- Non-Regulated as a Hazardous Material by US DOT
- Additional physical and handling data are available on the product SDS
- Available in 55-gallon drums and 270-gallon totes

Dosage Guide Descale Shield NW-140

Nominal Well Size		Standard Dosage	
in.	mm	gal/ft	l/m
2	51	0.05	0.65
3	76	0.1	1.3
4	102	0.2	2.5
5	127	0.3	3.7
6	152	0.45	5.6
8	203	0.8	10.3
10	254	1.2	15
12	305	1.8	22.4
14	356	2.4	30
16	406	3.2	39
18	457	4	50.3
20	508	5	61.5
22	559	6	74.5
24	610	7	87.6
26	660	8.3	102.5
30	762	11	138
34	864	14.3	177
36	914	16	197.5

Treatment Example

Treat 12 in. well, 180 ft. TD, SWL = 40 ft.

Step 1
Static height = (180 ft. - 40 ft.) =140 ft.
Step 2
Dosage Value = 1.8
Step 3
Volume of **Descale Shield** =
140 ft. x 1.8 gal./ft. = 252 gal.

Clay Dispersant

Nu-Well 220 Clay and Drilling Mud Dispersant

Description

In new well systems, use **Clay Dispersant** liquid polymer to break down drilling mud, remove natural clays and speed up well development.

- **Clay Dispersant** polymer uses liquid dispersant chemistry specifically designed to remove mud and clay from the well environment
- Successfully develops new wells without using phosphates
- Eliminates food source for bacteria (100 percent water soluble, readily flushed from well)
- Rehabilitates old wells plugged with clays, silts and fines
- NSF certified for potable water well use

Pre-Treatment and Application

For optimal removal of bentonite drilling fluids, separately pre-treat the well with 1,500 ppm chlorine to break down the polymers that are included in most commercial bentonite products. Thoroughly flush the chlorine solution from the well. Determine the drilling fluid volume and apply **Clay Dispersant** polymer at the rate of 1 gal. per 500 gal. of drilling fluid in the system to be broken down and removed from the well. Vigorously agitate by mechanical means for several hours (approximately 1/2 hour per 20 ft. of intake). If left in the well overnight, agitate before pumping out. Allow a minimum of 6 to 8 hours contact time, downhole.

In older well systems use **Clay Dispersant** polymer to remove fine sands, mud and clays that have filled in the gravel pack and borehole. Use at a rate of 1 gal. per 300 gal. of water. Vigorously agitate (by mechanical means), allowing the solution to stand in the well overnight and repeat the agitation the next day, before pumping out. Allow a minimum of 6 to 8 hours contact time, downhole.

Physical properties, shipping and handling

Appearance: Clear, slight amber colored liquid
Density: 10.5 lbs./gal.
Specific Gravity: 1.27
pH (as shipped): 7.0
Freeze point: 32°F (0°C)
Solubility: 100%
Use range: 0.002% to 0.5% by volume

- Not regulated as a hazardous material under 49CFR 172.101; however, in storage or use, avoid contact with strong acids or alkaline-based products
- Additional physical and handling data are available on the product SDS
- 1 gal. and 5 gal. containers can be shipped by UPS ground delivery
- Available in 1, 5, 30 and 55 gal. containers

Dosage Guide
Clay Dispersant NW-220

Nominal Well Size		New Well (@ 1:500)		Old Well (@ 1:300)	
in.	mm	gal/ft	l/m	gal/ft	l/m
2	51	0.001	0.01	0.001	0.01
3	76	0.001	0.01	0.001	0.02
4	102	0.001	0.02	0.002	0.03
5	127	0.002	0.03	0.003	0.04
6	152	0.003	0.04	0.005	0.06
8	203	0.005	0.06	0.009	0.1
10	254	0.008	0.1	0.01	0.2
12	305	0.01	0.1	0.02	0.2
14	356	0.02	0.2	0.03	0.3
16	406	0.02	0.3	0.03	0.4
18	457	0.03	0.3	0.04	0.5
20	508	0.03	0.4	0.05	0.7
22	559	0.04	0.5	0.07	0.8
24	610	0.05	0.6	0.08	1.0
26	660	0.06	0.7	0.09	1.1
30	762	0.07	0.9	0.1	1.5
34	864	0.09	1.2	0.2	2.0
36	914	0.1	1.3	0.2	2.2

Treatment Example

Treat existing 12 in. well, 180 ft. TD, SWL = 40 ft.

Step 1
Static height = (180 ft. - 40 ft.) = 140 ft.
Step 2
Dosage Value = 0.02 gal./ft. (12 in. well)
Step 3
Volume of **Clay Dispersant** =
(140 ft. x 0.02 gal./ft.) = 2.8 gal.

Bio Dispersant

Nu-Well 310 Dispersant and Acid Enhancer

Description

Bio Dispersant is a unique polymeric-acid chemistry that is the most effective product available for breaking down biofilm and dispersing mineral salts. **Bio Dispersant** provides a considerable boost to any acid-cleaning operation, is readily biodegradable and may be used to treat potable water systems and related equipment. **Bio Dispersant** maintains the acid reaction, holding minerals in suspension at pH levels up to 5.0 for thorough removal of biological material during flushing. Without the use of **Bio Dispersant**, dissolved minerals will drop out at pH levels above 3.0.

- Dislodges biofilm masses associated with iron oxidizing, sulfate-reducing and more prevalent slime forming bacteria, which are not removed by mineral acids alone
- Sequesters iron and inhibits corrosion on metal surfaces - iron sequestering allows the chemical solution to remove heavy accumulation of iron compounds
- Contains the best NSF certified inhibitor for water wells, protecting all forms of metal in the system, and will not attack plastic, neoprene or other synthetic materials - eliminating the need for acid inhibitors
- Provides passivation of metals when used with phosphoric acid
- NSF certified for cleaning potable water wells, pipelines and filter systems

Application

Bio Dispersant is designed for use with acid solutions to enhance the acid cleaning reaction and improve overall cleaning. Standard dosage is 3 percent (1 to 2 percent for maintenance). It is recommended that well construction and performance history be submitted, along with water samples for lab analysis, to properly determine dosage on large municipal and industrial wells.

1. Surface prepare a solution of water, acid and **Bio Dispersant** equal to approximately 40 percent of the total static volume into a vessel of appropriate size. First add water, then acid, then **Bio Dispersant**. **(Note: NEVER add water to acid! DO NOT mix Bio Dispersant directly to commercial concentrations of liquid acid, as polymer destruction may occur).**
2. Place the solution evenly across the intake zone, ensuring contact with affected areas at the recommended concentration. Agitate the cleaning solution to enhance the effectiveness of cleaning.
3. The solution should remain in contact for 18 to 48 hours, depending on the nature of the deposit. Monitor the pH and keep it below 3.0 during treatment. If additional acid is needed (to lower pH), add an amount equal to approximately 20 percent of the initial volume of the acid solution amount of acid applied.
4. Discharge the acid solution from the well, neutralize at the surface with **Neutralizer NW-600** and dispose in accordance with local regulations.

Physical properties, shipping and handling

Appearance: Amber liquid
Density: 10 lbs./gal.
pH (as shipped): 2.0
Specific Gravity: 1.19
Freeze point: 32 °F (0 °C)
Solubility (in water): 100%
Use range: 0.5 to 5% by volume
Bio Dispersant is an acid-based liquid. Avoid contact with strong alkaline materials or oxidizers. Use personal protective equipment (PPE) and clothing, especially where the possibility of inhalation exists. Most acids and alkaline materials will not affect **Bio Dispersant** concentrations below 25 percent.

- Not regulated as a hazardous material under 49CFR 172.101
- Additional physical and handling data are available on the product SDS
- Non-bioaccumulating
- 1 gal. and 5 gal. containers can be shipped by UPS ground delivery
- Available in 1, 5, 30 and 55 gal. containers

- See page 10 for Dosage Guide and additional technical information

Dosage Guide
Bio Dispersant NW-310

Nominal Well Size		Standard Dosage, 3%	
in	mm	gal/ft	l/m
2	51	0.004	0.0
3	76	0.01	0.1
4	102	0.02	0.2
5	127	0.03	0.3
6	152	0.04	0.5
8	203	0.07	0.8
10	254	0.10	1.3
12	305	0.15	1.8
14	356	0.20	2.5
16	406	0.26	3.2
18	457	0.33	4.1
20	508	0.4	5.1
22	559	0.5	6.1
24	610	0.6	7.3
26	660	0.7	8.6
30	762	0.9	11.4
34	864	1.2	14.7
36	914	1.3	16.4

***Note:** Standard dosage is for well rehabilitation. For routine maintenance, reduce dosage by 30 to 50 percent

Treatment Example

12 in. well, total depth = 600 ft., SWL = 50 ft.

Step 1
Static height = (600 ft. - 50 ft.) = 550 ft.
Step 2
550 ft. x 0.15 gal./ft. = 82.5 gal.
Step 3
83 gal. **Bio Dispersant** needed.*

* For wells with over 100 ft of screen it is recommended to use 1.5 times the standard dosage to account for the filter pack and allow deep penetration into the formation

Dispersant Boost

Nu-Well 400 Non-Ionic Surfactant

Description

Dispersant Boost is a surfactant designed to improve cleaning efforts in tight formations or heavily impacted well systems. The surface-active properties of **Dispersant Boost** are excellent for improving penetration of hard deposits or for wetting surfaces to be cleaned over a wide pH range.

Dispersant Boost may also be used to improve flow characteristics of heavy fluid or muds used in well construction. By changing the surface tension, **Dispersant Boost** improves cleanup of oil or biologically fouled areas. NSF certified for potable water well systems.

Application

One gallon of **Dispersant Boost** is used at the rate of 1 gallon per 1,000 gallons of water in the system being cleaned, or the total gallons of cleaning solution to be used. If the system is being cleaned for oil or heavy biofouling, use **Dispersant Boost** at the rate of one gallon per 500 gallons of water.

In wells that are severely impacted or contain pump lube oils, it is recommended to use 1.5 times the treatment volume to enhance cleaning.

Physical properties, shipping and handling

Appearance: Pale yellow colored liquid
Density: 9.4 lbs./gal.
pH (as shipped): 7.5-8
Specific Gravity: 1.13
Freeze point: 30°F (-1°C)
Volatility: 25%
Solubility (in water): 100%
Use range: 0.01 to 0.1% by volume

- Not regulated as a hazardous material under 49CFR 172.101
- The product is not considered dangerous and requires no special handling. Avoid contact with strong acids or alkaline-based products
- Additional physical and handling data are available on the product SDS
- 1 gal. and 5 gal. containers can be shipped by UPS ground delivery
- Available in 1, 5, 30 and 55 gal. containers

- See page 12 for Dosage Guide and additional technical information

Dosage Guide
Dispersant Boost NW-400

Nominal Well Size		Standard Dose		Heavy Oils	
in	mm	gal/ft	l/m	gal/ft	l/m
2	51	0.001	0.01	0.001	0.01
3	76	0.001	0.01	0.001	0.01
4	102	0.001	0.01	0.001	0.02
5	127	0.001	0.01	0.002	0.03
6	152	0.001	0.02	0.003	0.04
8	203	0.003	0.03	0.005	0.07
10	254	0.004	0.05	0.01	0.1
12	305	0.006	0.07	0.01	0.1
14	356	0.008	0.10	0.02	0.2
16	406	0.01	0.13	0.02	0.3
18	457	0.01	0.16	0.03	0.3
20	508	0.02	0.20	0.03	0.4
22	559	0.02	0.25	0.04	0.5
24	610	0.02	0.29	0.05	0.6
26	660	0.03	0.34	0.06	0.7
30	762	0.04	0.46	0.07	0.9
34	864	0.05	0.59	0.09	1.2
36	914	0.05	0.66	0.11	1.3

Treatment Example

Old 12 in. well, total depth = 600 ft., SWL = 50 ft. with heavy accumulation of turbine oil

Step 1

Height = (600 ft. - 50 ft.) = 550 ft.

Step 2

Dosage factor =0.01 gal./ft.

Step 3

550 ft. x 0.01gal./ft. = 5.5 gal.

Step 4

Add 5.5 gallons of **Dispersant Boost** to the cleaning solution

Chlor-Boost

Nu-Well 410 Chlorine Buffer and Enhancer

Description

Chlor-Boost is a unique chemistry that improves the biocidal capabilities of chlorine while increasing the treatment area into the bore hole and well formating, and providing secondary cleaning, significantly enhancing traditional chlorination efforts.

- Used with hypochlorite to increase effectiveness of chlorination
- Maintains pH in well at 6.5 during chlorination, increasing hypochlorous acid
- Increases biocidal activity by more than 100 times that of hypochlorite alone
- Contains a penetrant to allow deeper and more complete disinfection
- Controls calcium in hard water to increase the effectiveness of calcium hypochlorite
- Provides secondary cleaning of bacteria and biofilms in the borehole
- NSF certified for potable water well use

Application

Laboratory testing and field trials demonstrate that successful well chlorination is achieved with a chlorine concentration of 200 ppm. The following procedures are recommended for using **Chlor-Boost** chlorine enhancer with chlorine concentrations of 200 ppm.

1. Determine the static volume, the amount of **Chlor-Boost** and the amount of chlorine product necessary to treat the well. (Consideration should be given to increasing this volume by two to four times to allow sufficient disinfectant solution to reach all areas of the well and borehole that can harbor coliform bacteria or other contaminating organisms.)
2. In a tank on the surface, add the amount of **Chlor-Boost** to water as estimated from dosage guide. Mix the solution and measure the pH. The pH of the solution should be between 4.5 and 5 before adding the hypochlorite. All mixing should be done in a well-ventilated area. Caution: When chlorine is placed in an acid pH of 5.0 or lower, chlorine gas can be released. When the hypochlorite solution or powder is added, the pH will rise immediately, preventing any further chlorine release, but you should add the hypochlorite quickly and move away until the pH rises.
3. Place the chlorine solution in the well, evenly washing down the upper levels of the well before you place the solution throughout the water column
4. Agitate or surge the mixture to ensure good coverage. Let the solution stand in the well for 5 to 12 hours. Additional agitation before removal is beneficial. **Chlor-Boost** is buffered to hold the pH at the optimal level. However, if additional **Chlor Boost** is required, blend in a volume equal to 25 percent of the original mixed volume and add carefully so that the pH does not drop below 5.0, resulting in release of chlorine gas.
5. Pump the solution to the surface, neutralize using **Chlor-Out NW-500**, and discharge in accordance with local rules and regulations.

Physical properties, shipping and handling

Appearance: Clear, light amber liquid
Density: 9.3 lbs./gal.
pH (as shipped): 2.4 - 3.4
Specific Gravity: 1.12
Freeze point: 26° F (-3° C)
Solubility (in water): 100%
Use range: 0.01 to 1% by volume
Volatility: Non-volatile

- This product is not considered dangerous and does not require special handling or disposal
- Avoid contact with strong acids or alkaline-based products
- Not regulated as a hazardous material under 49CFR 172.101
- Additional physical and handling data are available on the product SDS
- 1 gal. and 5 gal. containers can be shipped by UPS ground delivery
- Available in 1, 5, 30 and 55 gal.

- See page 14 for Dosage Guide and additional technical information

Dosage Guide
Chlor-Boost NW-410

Nominal Well Size		NW-410		Calcium Hypochlorite 65%		Sodium Hypochlorite 12%		Sodium Hypochlorite 5%	
in	mm	qt/ft	l/m	lbs/ft	kg/m	gal/ft	kg/m	gal/ft	kg/m
2	51		0.002	0.00042	0.00062	0.00027	0.0033	0.0006	0.0079
3	76		0.005	0.00096	0.0014	0.00062	0.0076	0.0015	0.018
4	102		0.008	0.0017	0.0025	0.0011	0.013	0.0026	0.032
5	127	0.001	0.01	0.0027	0.0039	0.0017	0.021	0.0041	0.051
6	152	0.002	0.02	0.0038	0.0057	0.0025	0.030	0.0059	0.073
8	203	0.003	0.03	0.0068	0.010	0.0044	0.054	0.010	0.13
10	254	0.004	0.05	0.011	0.016	0.0068	0.085	0.016	0.20
12	305	0.006	0.07	0.015	0.023	0.0098	0.12	0.024	0.29
14	356	0.008	0.1	0.021	0.031	0.013	0.17	0.032	0.40
16	406	0.01	0.1	0.027	0.040	0.017	0.22	0.042	0.52
18	457	0.01	0.2	0.034	0.051	0.022	0.27	0.053	0.66
20	508	0.02	0.2	0.043	0.063	0.027	0.34	0.065	0.81
22	559	0.02	0.3	0.051	0.076	0.033	0.41	0.079	0.98
24	610	0.02	0.3	0.061	0.091	0.039	0.49	0.094	1.17
26	660	0.03	0.3	0.072	0.11	0.046	0.57	0.11	1.37
30	762	0.04	0.5	0.096	0.14	0.061	0.76	0.15	1.83
34	864	0.05	0.6	0.12	0.18	0.079	0.98	0.19	2.35
36	914	0.05	0.7	0.14	0.20	0.088	1.10	0.21	2.63

Note: Amounts based on application of 200 ppm chlorine concentration into well water with alkalinity of 100 ppm.

Treatment Example

Disinfect a 16 in. well, TD = 300 ft, SWL = 50 ft. with sodium hypochlorite 12% active

Step 1
Static height = (300 ft. - 50 ft.) = 250 ft.
Step 2
Amount **Chlor-Boost** = 250 ft. x 0.01 qt./ft. = 2.5 qt.
Step 3
Amount sodium hypochlorite = 250 ft. x 0.017 lb./ft. = 4.3 lbs.
Step 4
Batch: 250 ft. x 10.47 gal./ft.= 2,618 gal. water (2,618 gal. + 2.5 qt. + 4.3 lbs.)

If well water alkalinity or the recommended chlorine dosage level is greater than the standard values in the above table, adjust the amount of **Chlor-Boost** and the amount of hypochlorite concentrations as shown below	
Chlor-Boost	**Hypochlorite**
Amount above x (Alk/100)	Amount above x (recommended concentration/200)

Tip: Optimal results are obtained when the surface solution is two to four times the well volume, providing sufficient hypochlorite ions to disperse into the gravel pack and immediate surrounding formation where coliform organisms and nuisance bacteria exist. For large wells, this may not be practical and multiple batches, with proportions of chemistry, may be required to achieve desired results.

Chlor-Safe

Nu-Well 420 Chlorine Alternative

Description

Chlor-Safe is an alternative to traditional chlorine disinfection and is effective without pH control. It is a chlorinated isocyanurate compound for use in the disinfection of wells, storage tanks, and distribution pipelines.

- Safer than liquid chlorine, with no splashing, spills, or corrosive fumes
- Removes the need for pH control
- Dissolves quickly, even in cold water
- 55% available chlorine
- Easy to use
- Long shelf life
- NSF certified for potable water well use

Application

Chlor-Safe is mixed with potable water in a tank at the surface and the solution is placed in the well and agitated to disinfect the well casing, screen and filter pack.

1. Determine the static volume and the amount of **Chlor-Safe**. (Consideration should be given to increasing this volume by two to four times to allow sufficient disinfectant solution to reach all areas of the well and borehole that can harbor coliform bacteria or other contaminating organisms.)
2. In a tank on the surface, add the amount of **Chlor-Safe** to water as estimated from dosage guide.
3. Place the chlorine solution in the well, evenly washing down the upper levels of the well before you place the solution throughout the water column
4. Agitate or surge the mixture to ensure good coverage. Let the solution stand in the well for contact time required per local regulations. Additional agitation before removal is beneficial.
5. Pump the solution to the surface, neutralize using **Chlor-Out NW-500**, and discharge in accordance with local rules and regulations.

Physical properties, shipping and handling

Appearance: White to opaque coarse crystal
Density: 10.0 lbs./gal.
pH (as shipped): 6.5 in a 55% solution
Specific Gravity: 1.67
Freeze point: Not Applicable - solid
Solubility (in water): 28% at 25 C
Use range: 0.01 to 1% by volume

- This product is not considered dangerous and does not require special handling or disposal
- Additional physical and handling data are available on the product SDS
- 20 oz. and 9 lbs. containers can be shipped by UPS ground delivery
- Available in 20 oz.,9 lbs. containers and 45 lbs. pails

- See page 16 for Dosage Guide and additional technical information

Dosage Guide
Chlor-Safe NW-420

Nominal Well Size (in.)		50 ppm Solution		100 ppm Solution		200 ppm Solution		1000 ppm Solution	
in	mm	lbs/ft	kg/m	lbs/ft	kg/m	lbs/ft	kg/m	lbs/ft	kg/m
2	51	0.0001	0.001	0.0002	0.002	0.0005	0.003	0.002	0.02
3	76	0.0003	0.002	0.0006	0.004	0.001	0.008	0.006	0.04
4	102	0.0005	0.004	0.001	0.007	0.002	0.01	0.01	0.07
5	127	0.0008	0.006	0.002	0.01	0.003	0.02	0.02	0.1
6	152	0.001	0.008	0.002	0.02	0.004	0.03	0.02	0.2
8	203	0.002	0.01	0.004	0.03	0.008	0.06	0.04	0.3
10	254	0.003	0.02	0.006	0.04	0.01	0.1	0.06	0.4
12	305	0.004	0.03	0.009	0.1	0.02	0.1	0.09	0.6
14	356	0.006	0.04	0.01	0.1	0.02	0.2	0.1	0.9
16	406	0.008	0.06	0.02	0.1	0.03	0.2	0.2	1.1
18	457	0.01	0.07	0.02	0.1	0.04	0.3	0.2	1.4
20	508	0.01	0.09	0.02	0.2	0.05	0.4	0.2	1.8
22	559	0.01	0.1	0.03	0.2	0.06	0.4	0.3	2.1
24	610	0.02	0.1	0.04	0.3	0.07	0.5	0.4	2.6
26	660	0.02	0.1	0.04	0.3	0.08	0.6	0.4	3.0
30	762	0.03	0.2	0.06	0.4	0.1	0.8	0.6	4.0
34	864	0.04	0.3	0.07	0.5	0.1	1.0	0.7	5.1
36	914	0.04	0.3	0.08	0.6	0.2	1.2	0.8	5.8

Treatment Example

Treat 5 in. well, 180 ft. total depth, static water level = 40 ft.

Step 1
Static Height = (180 ft. - 40ft.) = 140 ft.
Step 2
Dosage Value from chart = 0.002 lbs/ft. (5 in. well)
Step 3
Volume of **Chlor-Safe** = 140 ft. x 0.002 lbs./ft. = .28 lbs. (approx 0.45 cups)

Convert: 1 lb. = 1.6 cups
1 kg. = 1200 ml

Standard dosage for 100 ppm chlorination is 0.0015 lb/gal, based on 1 times well volume.
For best results when disinfecting, or for persistent coliform issues, we recommend using 2-4 times total well volume.

Chlor-Out

Nu-Well 500 Chlorine Neutralizer

Description

Chlor-Out was designed to rapidly neutralize chlorine solutions following their removal from the well, prior to disposal.

- Used to neutralize chlorine solutions before their disposal
- Safe to handle
- Concentrated crystal that is easy to dissolve for fast neutralization
- Easy to use

Application

Chlor-Out acts immediately, reducing down-time and effectively neutralizing chlorine residuals. Most regulations prevent the discharge of chlorinated water.

1. **Chlor-Out** is used on the surface, after the well or system discharge has been pumped into a tank and neutralized in batches, as follows:
2. Measure the chlorine level in the water, and calculate the dosage of **Chlor-Out** needed for neutralization, as indicated on the table
3. Mix **Chlor-Out** with the chlorinated water. The chlorine levels will neutralize almost immediately If dechlorinating a large volume, dissolve **Chlor-Out** in 1 gal. of water for every pound of **Chlor-Out** required. Some heat is generated upon dilution
4. Use test strips or meter to test chlorine levels prior to discharge
5. Discharge to an approved outlet

Physical properties, shipping and handling

Appearance: White to opaque coarse crystal
Density: 10.0 lbs./gal.
pH (as shipped): 8.6 (7.5% solution)
Specific Gravity: 1.67
Freeze point: Not Applicable - solid
Solubility (in water): 33% at 32 C
Use range: 0.01 to 1% by volume

- This product is not considered dangerous and does not require special handling or disposal
- Not regulated as a hazardous material under 49CFR 172.101
- Additional physical and handling data are available on the product SDS
- 10 lbs. containers can be shipped by UPS ground delivery. 50 lbs. pails available
- Available in 10 lbs. containers and 50 lbs. pails

Note: For best results, first dissolve **Chlor-Out** in water; then add to the well discharge as a solution (about 1 lbs. of **Chlor-Out** to 1 gal. of water).

Dosage Guide
Chlor-Out NW-500 (per Treatment Volume)

Chlorine Discharge (ppm)	Batch Volume to be treated					
	Gallons			Liters		
	100	500	1000	390	1900	3800
20	0.01	0.1	0.1	0.05	0.3	0.5
40	0.03	0.1	0.3	0.1	0.5	1.0
60	0.04	0.2	0.4	0.2	0.8	1.5
80	0.05	0.3	0.5	0.2	1.0	2.0
100	0.07	0.3	0.7	0.3	1.3	2.5
120	0.08	0.4	0.8	0.3	1.5	3.0
140	0.09	0.5	0.9	0.4	1.8	3.5
160	0.1	0.5	1.1	0.4	2.0	4.0
180	0.1	0.6	1.2	0.5	2.3	4.5
200	0.1	0.7	1.3	0.5	2.5	5.1
250	0.2	0.8	1.7	0.6	3.2	6.3
300	0.2	1.00	2.0	0.8	3.8	7.6
350	0.2	1.2	2.3	0.9	4.4	8.8
400	0.3	1.3	2.7	1.0	5.1	10.1
450	0.3	1.5	3.0	1.1	5.7	11.4
500	0.3	1.7	3.3	1.3	6.3	12.6

Treatment Example

Neutralize a 1,000 gal. tank of well discharge with a chlorine concentration of 180 ppm.

Step 1
Dissolve 1.2 lbs. of **Chlor-Out** into approximately 2 gal. of water
Step 2
Add to the tank

Neutralizer

Nu-Well 600 pH Neutralizing Agent

Description

Neutralizer is a food grade, powdered alkali (base) designed for the neutralization of acidic solutions while limiting the generation of harmful vapors or byproducts.

Application

Neutralizer reacts spontaneously with acid solutions, raising the overall pH of the solution. The reaction of **Neutralizer** and an acid produces a salt and carbonic acid, which readily decomposes to carbon dioxide and water as the final reaction products. When the bubbling stops, the reaction is complete and the acid solution can be disposed of. Keep the area well ventilated during the neutralization process.

1. Dissolve **Neutralizer** in a holding vessel with water
2. Add the acidic solution slowly into the vessel until the fizzing stops
3. Discharge to an approved outlet
4. If additional neutralization is needed, blend **Neutralizer** with water and slowly add it into the vessel, limiting splashing

For spills, neutralize the acid by pouring the raw **Neutralizer** powder over the spills until the fizzing stops.

Physical properties, shipping and handling

Appearance: White to opaque coarse crystal
Density: Approximately 70 lb./ft.^{3}
pH (as shipped): 8.3 at 77° F

- Odorless, has a bitter, salty taste
- Highly soluble in water, can be separated from water through evaporation
- Decomposes at temperatures above 50°C
- CAS No. 144-55-8
- Available in 50 lbs. containers

Amount of Neutralizer needed to neutralize acid removed from well

Batch Volume (gal)	Batch Volume (l)	For Nu-Well 130 (lbs)	For Nu-Well 130 (kg)	For Nu-Well 120 (lbs)	For Nu-Well 120 (kg)	For Nu-Well 110 (lbs)	For Nu-Well 110 (kg)
50	190	11	5	34	16	33	15
100	380	22	10	68	31	65	30
500	1900	110	50	342	156	326	149
1000	3800	220	100	684	312	652	297

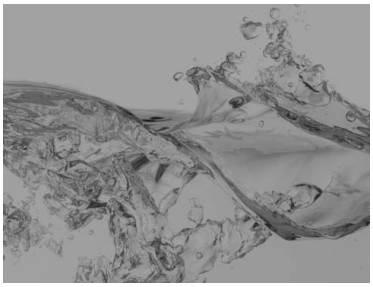
*This table assumes standard acid treatments were used.

Treatment Example

Neutralize a 1,000 gal. tank with discharge of an acid solution of **Descale Heavy NW-130**

Step 1
Dissolve 220 lbs. of **Neutralizer** in enough water to form a solution
Step 2
Pump acid from well into the holding tank and hold until fizzing stops and the water is neutral
Step 3
Discharge in accordance to local regulations

Well Cleaning and Chlorinating Tool



The Well Cleaning and Chlorinating Tool is a software designed by Johnson Screens experts that provides recommendations for chemical treatments based on your good configuration.

This document not only displays treatment and mixing volumes, but also provides a range of treatment options with different Nu-Well chemicals and their quantities to be used. It further includes a detailed treatment procedure that can be readily used as a reference in your field operations.

Scan to Acess Tool

To access the Well Cleaning and Chlorinating Tool, go to:
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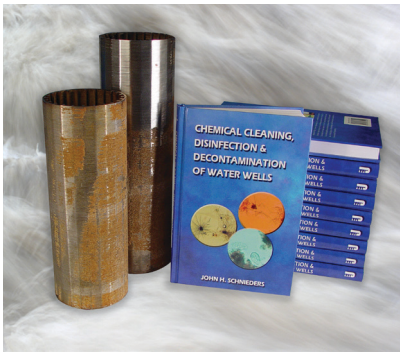
Chemical Cleaning, Disinfection & Decontamination of Water Wells

Chemical Cleaning, Disinfection & Decontamination of Water Wells is a concise, complete assessment of the important role certain chemicals play in modern water treatment, water system construction and maintenance programs.

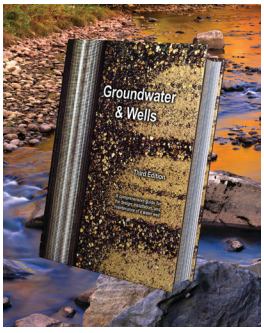


Included in this text are complete descriptions of chemicals frequently used in water supply applications. With a focus on effective and efficient use of chemicals, individually or in combination, to achieve better well rehabilitation, water system cleaning and water quality treatment.

Diagrams, formula mix ratios and other technical data are included, along with proper handling techniques for each chemical and, where appropriate, clear warnings about possible hazards and the conditions that can cause them.

Chemical Cleaning, Disinfection & Decontamination of Water Wells is in a convenient format for use on job sites, as well as in classrooms and labs.

Groundwater & Wells



Recognized worldwide by engineers, scientists and well drillers, Groundwater & Wells, Third Edition, is used as the authoritative text on hydrogeology, well hydraulics, design, construction and materials and is available for purchase at johnsonscreens.com.

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