



AQUA-CLEAR[®] MGA

Modified Granular Acid

Description AQUA-CLEAR MGA is a dry blend of granular acid and additives used in the removal of iron, manganese and carbonate scale. It retains strength longer than most liquid acids, which increases its cleaning capability.

Applications/Functions

- Disperse scale and incrustation
- Remove scale and incrustation from the water well screen, casing, gravel pack and pumping equipment
- Restore well production
- AQUA-CLEAR MGA can be used in combination with AQUA-CLEAR[®] AE to remove more difficult scale and incrustation

Advantages

- NSF/ANSI Standard 60 certified
- Safe to use on all plastics, rubber and metals
- No harmful vapors
- Improves water quality (color, taste and appearance)
- Reduces equipment and piping failures due to scale build-up and corrosion
- Reduces pumping costs

| | | |
|---------------------------|-----------------------|--|
| Typical Properties | • Appearance | Free-flowing, off-white granules |
| | • Specific gravity | 2.00 |
| | • pH (10% solution) | 0.9 |
| | • Solubility in water | Complete with slight to hazy turbidity |

Recommended Treatment

- Record initial well water pH
- The preferred application method is to apply a solution of AQUA-CLEAR MGA into the screened interval through a tremie pipe.

**Recommended
Treatment
(continued)**

- Mix AQUA-CLEAR® MGA with water at ½ - 1 pound per gallon of water or 0.06 - 0.12 kilograms per liter of water and apply directly into screened interval with a tremie pipe. When utilizing this method, the minimum calculated volume of water can be determined by using the borehole diameter and the length of the screened interval and double the calculated volume to account for the water inside the screen, gravel pack and the formation interface.

Note: The previous concentration of AQUA-CLEAR MGA is recommended for a complete reconditioning of an existing well.

- Calculation for volume in well:
- Gallons per foot = (diameter, inches)² x 0.042
- Liter per meter = (diameter, millimeters)² x 0.0008
- Displace solution into the well screen and formation, then surge, swab, agitate or jet well through screen and gravel pack for 20-30 minutes.
- Allow to stand in well for up to two hours and then repeat activity approximately every two hours for a period of 24 hours.
- Pump well to waste until well water pH is within 0.5 of original well pH.

Note: Wastewater can be neutralized by adding soda ash or lime

- Chlorinate well and reconnect to water distribution system.

Caution: Never mix chlorine and AQUA-CLEAR MGA in well.

- If necessary, AQUA-CLEAR MGA may be poured directly into well as per treatment table, but results will not be as good as if applied in a dissolved form via a tremie pipe. The undissolved form will require more mechanical agitation.

Note:

- ***In heavily encrusted wells, it is desirable to brush or scrape the casing and screen, then pump or airlift the debris to waste prior to treating with acid.***

The following charts recommend a concentration of AQUA-CLEAR MGA that is suitable for a typical maintenance treatment of an existing well.

| AQUA-CLEAR MGA Application Amounts per 10 Feet of Standing Water | | | | | |
|--|-------------------|------------------------|-------------------|------------------------|-------------------|
| Well Diameter (Inches) | Pounds of Product | Well Diameter (Inches) | Pounds of Product | Well Diameter (Inches) | Pounds of Product |
| 2 | 0.35 | 12 | 12.73 | 24 | 50.94 |
| 4 | 1.41 | 14 | 17.33 | 26 | 59.78 |
| 5 | 2.21 | 16 | 22.64 | 28 | 69.33 |
| 6 | 3.18 | 18 | 28.65 | 30 | 79.60 |
| 8 | 5.66 | 20 | 35.37 | 36 | 114.61 |
| 10 | 8.84 | 22 | 42.80 | 48 | 203.75 |

Recommended Treatment (continued)

| AQUA-CLEAR® MGA Application Amounts per 10 Meters of Standing Water | | | | | |
|--|-----------------------------|------------------------------------|-----------------------------|------------------------------------|-----------------------------|
| Well Diameter (millimeters) | Kilograms of Product | Well Diameter (millimeters) | Kilograms of Product | Well Diameter (millimeters) | Kilograms of Product |
| 51 | 0.53 | 305 | 18.97 | 610 | 75.90 |
| 102 | 2.11 | 356 | 25.83 | 660 | 89.10 |
| 127 | 3.29 | 406 | 33.73 | 711 | 103.31 |
| 152 | 4.74 | 457 | 42.69 | 762 | 118.60 |
| 203 | 8.43 | 508 | 52.71 | 914 | 170.77 |
| 254 | 13.18 | 559 | 63.78 | 1219 | 303.60 |

Note: The concentrations of AQUA-CLEAR MGA shown in the previous tables do not take into account the 100% excess volume required to compensate for the water present in the formation interface and gravel pack. The previous tables only account for the product concentration required for the volume of water occupying a 10 foot or 10 meter section of a given size of screen.

For other diameters:

- Gallons per foot = (diameter, inches)² x 0.042
- Liter per meter = (diameter, millimeters)² x 0.0008
- Pounds of AQUA-CLEAR MGA = (gallons per foot x 8.34) x 0.026
- Kilograms of AQUA-CLEAR MGA = (liters per meter) x 0.026
- Double the calculated volume in order to take into account the water present in the gravel pack and formation interface.
- AQUA-CLEAR® AE can be used with AQUA-CLEAR MGA for iron bacteria treatment. When used together, utilize one gallon of AQUA-CLEAR AE for every 10 pounds of AQUA-CLEAR MGA or 0.84 liters of AQUA-CLEAR AE for every kilogram of AQUA-CLEAR MGA.

Safety

- AQUA-CLEAR MGA is safe to handle when in dry form, but when mixed with water it should be handled in accordance with recognized standard practices for handling corrosive and acidic materials (refer to Material Safety Data Sheet).
 - Avoid skin and eye contact – flush with water
 - Do not ingest and avoid prolonged inhalation
 - When disposing of waste fluid make sure to comply with all federal, state and local regulations as applicable.
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Packaging AQUA-CLEAR® MGA is packaged in 5-gal (19-liter) pails containing 50 pounds (22.7 kg).

Shipping The following are required for commercial transport:

- Insurance policy must include an endorsement for transporting hazardous cargo.
 - Vehicle driver must have a Hazmat endorsement on his/her Commercial Drivers License.
 - Hazardous Materials Certificate of Registration issued by the U.S. Department of Transportation (renewable annually) is required.
 - Consult the state in which operating for any additional requirements that may exist.
 - No hazardous materials placard is required for shipments less than 1000 pounds.
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Availability AQUA-CLEAR MGA can be purchased through any Baroid Industrial Drilling Products Retailer. To locate the Baroid IDP retailer nearest you contact the Customer Service Department in Houston or your area IDP Sales Representative.

Baroid Industrial Drilling Products

Product Service Line, Halliburton

3000 N. Sam Houston Pkwy E.

Houston, TX 77032

Customer Service (800) 735-6075 Toll Free (281) 871-4612

Technical Service (877) 379-7412 Toll Free (281) 871-4613
