Inject-a-Cure
Ag Solution Injection System

by:
SDI

Owner’s
Set-Up and
Operations Manual

Manufactured by:
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Introduction

For hundreds of years farmers have been applying fertilizers and amendments to maintain proper soil conditions and provide an environment for healthy crops.

Gypsum is the most common and least expensive amendment and has been in use for over two centuries. It's only in the last several years the myriad benefits of gypsum have become widely understood and exploited. Up until recently the vast majority of gypsum used in agriculture was field spread, typically using the low-grade form found in abundance in the West. This procedure dramatically limits the application and the benefits that gypsum provides.

Realizing the potential, several attempts have been made over the years to introduce a gypsum solution directly into the irrigation water. The low purity and coarse grind of commonly available gypsum limited success and continued to plague the process in micro and drip irrigation.

In the early 1990's, several gypsum companies built mills designed exclusively for grinding gypsum to a very fine powder for agricultural use. This new technology combined with a vast supply of high-grade gypsum (typically 95%+), led to the development of what is now known as solution grade gypsum.

With this high-purity and fine grind gypsum now readily available, SDI was able to eliminate the need for the complicated “extractor” based machines that were originally developed using low grade “wallboard” gypsum. The SDI System was specifically designed to be simple, durable and virtually maintenance free, taking advantage of the new higher grade of gypsum available.

Along with the gypsum, the SDI machine is also suitable for the injection of other soil amendments like limestone and potassium products.

By applying only approved amendments and taking care to apply them at the appropriate time and rate, you will enjoy many years of service from your SDI Injection System.
General Overview

The SDI Solution Injection System is designed to allow a variety of soil amendments to be thoroughly blended and then injected directly into the irrigation water. It works great in all types of irrigation systems, including flood, sprinklers, micro-sprinklers, drip and subsurface tape. A high pressure diaphragm pump is standard on all models for flexibility in injection pressure adjustment.

Its simple, durable and virtually maintenance-free design make it unique among other injection systems. With its thicker agitation bar and patented super strength bearings, the SDI system is the only injector of its kind that does not require frequent grease and maintenance!

And, we offer most every model with options like Honda gas engines, hydraulic motors instead of electric, automatic fill and automatic injection rate capability, trailer packages and more.

In normal use, the heavy-duty fiberglass main tank is first filled with water. The fresh water source can either be an existing pressurized irrigation line or with an optional fill pump, water may be pumped from a ditch, pond or other similar source.

With the machine running, solution gypsum is then added to the water. Gypsum and other amendments may be conveniently added by 50 pound bag, 1 - ton bag or self-feeding silo.

The stainless steel agitation blades near the bottom of the tank mix the solution thoroughly to form a uniform slurry. The high-pressure diaphragm pump injects the mixture into the irrigation flow at a predetermined rate throughout the irrigation set.

Another unique feature of the "Inject-a-Cure" injection system is its ability to inject a solution either on a declining curve basis or at a fixed or flat rate, without additional equipment. Each model is equipped with a ball float valve and a floating suction intake. Controlled irrigation users can simply leave the fresh water intake valve open thereby maintaining a constant fluid level in the tank.

Anyone desiring a specific dilution rate may shut the fill valve. The slurry will then be output at a constant rate without dilution throughout the irrigation set as the level in the main tank is drawn down. Install a simple timer and the machine will automatically refill itself and be ready for the next use.
Ag Inject-a-Cure Equipment Features
300 and 600 Gallon Models

<table>
<thead>
<tr>
<th></th>
<th>600 Gallon</th>
<th></th>
<th>300 Gallon</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions</td>
<td>109&quot;</td>
<td>Long</td>
<td>84&quot;</td>
</tr>
<tr>
<td></td>
<td>51&quot;</td>
<td>Wide</td>
<td>44&quot;</td>
</tr>
<tr>
<td></td>
<td>53&quot;</td>
<td>High</td>
<td>44&quot;</td>
</tr>
<tr>
<td>Weight</td>
<td>850 Pounds</td>
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<td>430</td>
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</tbody>
</table>

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# Ag Inject-a-Cure Features

| #1 | Heavy-duty custom molded fiberglass mixing tank, 300 or 600 gallon available. |
| #2 | Large, vented lid opens for easy access filling and includes stainless steel basket inside to help prevent large debris from accidentally entering tank. |
| #3 | Fresh Water bypass allows simple metering adjustment for any application. Increases pump valve life. |
| #4 | Repair access lid for internal component adjustment. |
| #5 | Fresh water inlet for filling tank. Includes auto shut-off valve (inside). |
| #6 | Fill valve opens to allow fresh water into fill tank and pre-dilute output slurry. |
| #7 | Filter screen protects diaphragm pump from debris and includes a redirect valve to allow screen to be cleaned without turning off machine. |
| #8 | Dependable long-life dual “V” belt and pulley drive system. |
| #9 | Motor and belt guard—not shown. |
| #10 | High pressure diaphragm pump requires little maintenance and has excellent durability. |
| #11 | 480V 3ph 2hp motor is standard with many others available. (Built-in sunshade extends motor life—not shown). |
| #12 | Mag starter with on/off switch provides for convenience and safety. |
| #13 | Patented stainless steel packing gland assembly w/Teflon packing and greaseless tungsten carbide bearings. |
| #14 | Floating suction hose (inside) allows tank to be pumped empty for simple and accurate “constant rate” metering into irrigation flow. |
| #15 | Discharge valve and outlet begins injection of amendments into the flow gauge and safety relief valve assembly. |
| #16 | Discharge return line returns slurry to tank when discharge valve is closed during operation. |
| #17 | Patented one piece stainless steel agitator shaft w/tungsten carbide bushings and 6 stainless steel paddles provide optimum mixing. |
| #18 | Sturdy all steel frame. |
| #19 | Patented rear stainless steel and tungsten carbide bearing assembly. |
You have purchased a superior injection system designed for ease of use and built to provide many years of trouble-free service. By following the procedures and guidelines, this injection system will perform safely and reliably for many years to come.

Please take a moment to read through this documentation and familiarize yourself with the construction and proper operation of the SDI Injection System.

CAUTION: Misuse or improper operation could cause property damage and/or bodily injury. Please read the following precautions:

Keep Work Area Safe
- Keep work area clean. Water, oil and other spills can make the ground or cement pad slippery and increase shock hazards.
- Never store flammable liquids or gasses near the machine.
- Only experienced operators should work on or near the machine. Keep all others at a safe distance.

Keep Unit Grounded
- Wiring and electric motors must be properly grounded. All wiring and fuses must be sized to comply with state and local electrical codes and meet proper current capacity.

All electrical hook up must be done by a certified electrician.

Check for Worn or Damaged Parts
- Examine hoses, belts, fittings and wires for wear and/or damage.
- Check drive belts, hoses and bearing packing regularly. Tighten or replace as required.

- Always operate belt driven models with belt guard attached.

If you have questions about how to operate and service your SDI Injection System or to order repair parts, please contact your local dealer or call our main office at 559-734-5555.

Drain Tank
- Always run the unit until all amendments have been injected and only fresh water remains in the tank before shutting down for any length of time.
- During storage or long idle periods, it is best to drain the main tank and hoses to prevent freezing and stagnate water conditions.
- Before moving trailer mounted models, be careful that all hoses and electric connections have been detached and properly stored.

Injection Precautions
- Injection unit should be located on hard, level ground or on a cement pad only.
- Use only appropriate high-pressure hose and fittings for installation and operation.
- Keep top lid closed during operation to prevent unwanted debris from entering the mixing tank.
- Never fill and operate the injector without one way check valves in place.
WARNING: This unit operates at very high water pressures (up to 250 psi). Never modify or obstruct the pressure regulator or bypass system. Damage and/or injury may result.

Pre-Installation—

WARNING—DANGER

This Injection System is designed to mix and inject non-hazardous, non flammable soil amendments only. Never attempt to use the SDI system to inject corrosive acids or other hazardous or flammable products. The use of such products or procedures is prohibited and may result in severe damage and/or injury.

Important Safety Information:

Please read carefully before operating pump.

• Warning: DO NOT pump corrosive or hazardous chemicals or flammable/explosive fluids. DO NOT use in explosive atmospheres.

The pump should be used only with liquids compatible with the pump component materials. DO NOT pump any amendments/chemicals not shown on the Approved Amendments Chart enclosed.

Personal injury or property damage may result and the warranty will be void.

• Do not operate pump above set rpm. If a pulley must be replaced for any reason, be certain the replacement is the same diameter as the original factory pulley.

• Make certain the power source conforms to the requirements of your equipment and that the motor is wired to turn in the proper direction (note arrow on belt guard).

• Never operate the pump and motor without the belt guard in place.

• Release all pressure within the system before servicing any component.

• Drain all liquids from the system before servicing.

• Secure the discharge lines before starting the pump. An unsecured discharge line may whip, causing personal injury and/or property damage.

• Periodically inspect the pump and the system components. Perform routine maintenance as required.

• When wiring an electrically driven pump, follow all electrical and safety codes, as well as the most recent National Electrical Code (NEC) and the Occupational Safety and Health Act (OSHA).

• WARNING: Because of risk of electrical shock, all wiring should be done by a qualified electrician.

• WARNING: Do not handle a pump or pump motor with wet hands or when standing on a wet or damp surface, or in water.

• Do not operate a gasoline engine in an enclosed area. Be sure the area is well ventilated.

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• Use only pipe, hose and fittings rated for maximum rated pressure of pump or pressure at which pressure relief valve is set. **DO NOT USE “USED” PIPE OR HOSE!**

• Do not use this system for pumping anything intended for human or animal consumption.

**Installing the Inject-a-Cure Injection System:**

1. **Select a Location**
   A. Locate the injector on a smooth hard surface. Keep in mind you will need to tap into a pressurized line to fill the solution tank.
   B. If your irrigation system has a main filter, the tap for the solution injection port should be located before the filter.
   C. You will also need to allow access to the machine for filling and maintenance.

2. **Pre-Operation Set-Up**
   A. Check the ball float located on the inside of the main tank at the fresh water inlet fitting. Adjust the ball arm by bending it so that it does not come in contact with the top of the tank when in the fully closed (up) position.
   B. If your model has a lower level float valve near the bottom, make certain the fitting is tight and that the ball float moves freely in a vertical plane.
   C. Insert the stainless steel filter basket into top hatch opening.

3. **Fresh Water Supply:**
   A. Locate or install a 3/4” NPT fitting at the pressurized fresh water source. To minimize air getting into the unit, the water supply fitting should be located at 3 or 9 o’clock and downstream of any filters. Also install a water pressure regulator set at 20-50 psi. Install a shut off valve (not included) and attach a 3/4” hose barb.

   **NOTE:** You must install a valve to shut off the water supply to the injection system for maintenance and safety. A shut-off valve is also required in order to use the pump-down capability of the Inject-a-Cure unit.

   B. Attach a length of hose from the hose barb to the fresh water inlet located on front of the main tank, down at the bottom near the vertical sight glass. Be sure to use hose rated for the highest pressure in your irrigation system and attach each end with two hose clamps.

   C. If filtered water is not already available, splice a debris screen into the filter hose near the fresh water inlet fitting.

4. **Solution Injection Hook-Up**
   A. Locate or install a 1/2” NPT fitting (not included) into the irrigation system at a point **after** any main filters. For best results, solution should be injected at about a 45° angle, pointing in the direction of the flow of water and at least 2 feet downstream of the inlet water supply to solution unit.

   B. Attach a 1/2" hose barb and one end of the high-pressure hose (included) to the injection tap.

   C. Attach the other end of the 1/2" hose to the discharge outlet located on the front of the Inject-a-Cure unit.
D. Splice the one-way check valve into the hose at a point near the solution injection tap. Use only high pressure design hose and hose clamps and be sure the arrow on the valve points towards the irrigation system.

NOTE: The check valve (not furnished), is required to prevent irrigation water from backing up into the machine.

5. Electrical Connection
A. The electric motor that drives the pump and agitation bar is prewired to a mag starter in a weather tight control box to turn the unit on and off (Optional on some models).

Ensure the supply voltage is correct for the motor (i.e. 110, 240/480 volt, single or three phase). A breaker must be in place to automatically disconnect the power at the source in case of accidental contact or downed lines.

Follow all state and local electrical and safety codes, as well as the most recent National Electrical Code (NEC) and the Occupational Safety and Health Act (OSHA).

Warning: Because of risk of electric shock, all wiring needs to be performed by a qualified electrician.

Do not handle pump or pump motor with wet hands or when standing on a wet or damp surface, or in water.

6. Final Equipment Check
A. Take time to check all fittings, clamps and connections to make sure all are secure. Check that the belt is tight and the belt guard is mounted securely in place.
B. Double check to make sure all ball floats are mounted and adjusted correctly inside the tank.
C. Be certain the oil is visible half way up the clear sight tube on the diaphragm pump. (Fill with 30W non-detergent motor oil as necessary).

Daily Operation
1. Fill the Main Tank with Water
A. With irrigation system pressurized, open the fresh water fill valve “A” to begin filling the holding tank with water. As the tank nears full, the internal ball valve will automatically shut off the flow of incoming water. Valve “A” is shown in the closed position in the photo.
B. For constant rate output, close the fill valve “A” once the tank is full. This will allow the tank to empty, injecting a consistent, non-diluted solution.

For declining rate application, the fill valve “A” may be left open to maintain a constant fluid level in the tank. This will inject the soil amendment on a declining curve rate as the incoming water dilutes the slurry mix.
2. Turn the System On
   A. Check that the redirect Valve
      “B” located adjacent to the
      pump inlet debris screen, is
      in the closed position to draw
      liquid from the tank. (The
      handle should be facing away
      from the tank as shown). With
      the handle turned to right, the
      pump will draw air only.
   B. The discharge outlet, Valve “C”
      should be turned to the closed
      position. (Handle should be
      turned in line with the discharge
      flow as shown). This allows
      the pump to start up under no-
      load conditions to increase
      motor or engine life.
   C. Turn the machine “ON” at the
      control box to energize the pump
      and agitation bar.
   D. Check for leaks around all
      fittings and the agitation shaft
      front bearing. A leaking front
      bearing housing can usually be
      stopped by turning the machine
      off and simply tightening the
      packing gland. (See
      “Maintenance” later in this
      manual).

3. Add Amendments
   A. For gypsum application, add
      the quantity of solution grade
      gypsum suggested by your water
      testing results, not to exceed the
      following amounts:

      300 Gallon tank not to exceed
      1,500 pounds of gypsum.
      600 Gallon tank not to exceed
      3,000 pounds of gypsum.

      Caution: This Inject-a-Cure was
      designed for use with true solution
      grade gypsum only. Use of sub-
      standard gypsum can cause excessive
      wear, frequent filter flushing,
      clogging and may void the factory
      warranty.

      Please refer to “Solution Gypsum
      Specifications” later in this manual for
      the minimum specifications of
      acceptable product, prior to operation.

      If adding gypsum from one ton bulk
      bags, be careful not to empty a full bag
      into the 300 gallon model—this will
      overload the machine

   B. Allow the machine to operate for
      a few minutes to insure the slurry
      is completely and uniformly
      blended.

4. Adjust Output and Begin
   Injection
   A. If a manual valve has been
      installed in the irrigation pipe at
      the point of injection, be sure to
      check that it is in the OPEN
      position.

   B. Slowly rotate the Discharge
      Outlet Valve “C” to the OPEN
      position (handle to left), to begin
      injection. The diaphragm pump
      will automatically adjust
      discharge pressure to compensate
      for any irrigation line pressure
      up to 150 psi.
C. Rotate the Fresh Water Bypass Valve "D" counterclockwise to the fully "OPEN" position. Read and note the total gallons per minute water flow by reading the calibration lines on the fresh water sight glass (should be around 5-6 GPM with a standard pump).

D. Refer to the "Discharge Rate Chart" in this manual to determine the desired GPM of slurry output for the desired application rate. Subtract this number from the total GPM flow determined in Step C above.

E. Watch Sight Glass "E" and slowly rotate the Fresh Water Bypass Valve "D" clockwise to reduce the flow of fresh water down to the newly calculated net rate determined in Step D above.

Example: With Fresh Water Bypass Valve "D" turned all the way open, sight glass indicates 6 GPM total water flow. Desired injection rate is determined to be 2 gallons per minute of slurry (6-2=4). Slowly close Fresh Water Valve "D" until the sight glass reads 4 gallons per minute. This will cause the diaphragm pump to automatically draw 4 gallons of fresh water plus 2 gallons of slurry from the holding tank.

F. Reload the machine as desired when the water runs clear or after refilling the tank in the constant rate (pump down) mode.

Maintenance

You have selected the most "user friendly", maintenance-free injection system available for gypsum and other powdered amendments. Care in selecting and using only true, high-grade solution gypsum (and other compatible amendments), will keep your injector running smoothly with minimal attention.

Your SDI machine was designed with common brand name components whenever possible to reduce replacement costs and insure parts availability when maintenance is required.

The following outlines steps to service and maintain your SDI injection system.

Before Each Start-Up:

1. Check that the oil is visible half way up on the clear sight tube on the diaphragm pump. Fill with 30W non-detergent motor oil as required.

2. Turn the redirect valve to close off the fluid in the main tank and clean the debris filter located on the front of the machine and any other screens that may be installed. Remember to turn the valve back on before starting the machine.

3. Check that the internal ball float valve(s) are adjusted and working properly.
4. Take time to check over all fittings, clamps and connections to make sure all are secure and not leaking. Be sure the belt is tight and the belt guard is in place.

5. If agitation shaft front bearing is leaking, simply tighten the adjusting nuts until the leak stops. **DO NOT OVER-TIGHTEN** the adjusting nuts. Only about 1/4 to 1/2 turn on each of the adjusting nuts should be required to stop any leak.

Over tightening will lead to rapid wear of the packing material and possibly the shaft. Occasional small adjustments are required to maintain the integrity of the seal. If one or more turn of the adjusting nuts does not stop the leak, replace the packing material or severe wear on the agitation shaft may result (See Replace Packing Material).

**Every 500 Hours:**

1. Change the oil every 500 hours or three months, whichever comes first. To drain the oil, follow these procedures:

   **D30 and D50 Pumps:** Remove the drain plug and oil sight glass covers and rotate shaft until the oil stops flowing. Install the drain plug.

   Slowly pour new oil into sight tube while turning the pump shaft. Turning the pump shaft purges all of the air out of the crank case.

   Always change oil when replacing diaphragms.

   **Safety Note:** The bypass return outlet on the discharge valve and pressure relief valve must be connected directly to the main tank without any restrictions of valves.

   **Annually or as Needed:**

   **Replacing the Packing Material.** The packing gland is located on the front of the machine where the main agitator shaft extends out of the mixing tank. Once or twice a year, or whenever excessive leaking occurs that routine tightening of the adjusting nut will not stop, the packing material in the packing gland must be replaced.

   1. Turn off injector and secure against accidental start-up.

   2. Remove fiberglass belt guard. Loosen both adjusting nuts and slide the backing plate and packing nut out away from the packing gland.

   3. Dig out and discard any remaining pieces of the old packing material.
4. Wind new packing material around the shaft; use a screwdriver to push the packing material firmly down into the packing gland. Continue this process until the packing gland is full; cut the packing rope off.

5. Slide the packing nut and backing plate back towards the packing gland; tighten the adjusting nuts down hand tight.

6. Replace the bolt guard and start the injection machine. If the packing is leaking, turn off the machine and tighten the adjustment nuts approximately 1/4 turn each. Continue this procedure until the leaking stops. **DO NOT OVERTIGHTEN!**

**Valve Replacement**

Occasionally debris can build up and cause improper seating of the valves and/or damage to the o-rings, causing the pump to pulsate. To check for damage, follow these steps:

- Remove the pump manifolds (heads). With the manifolds removed, valves can easily be removed and inspected for debris and wear. Replace valves, O-rings and manifolds as necessary.

**Diaphragm Replacement (D30)**

If pump oil becomes milky or it comes out the discharge outlet, one or more of the diaphragms have ruptured. The diaphragm material does age and should also be replaced annually or more often under heavy use. Change diaphragms every 500 hours or three months, whichever comes first.

1. Drain the oil as instructed previously.

2. Remove pump head bolts and heads.

3. Remove the bolt securing the diaphragms (See Figure below).

4. Remove the old diaphragm and the washer (See Figure above).

5. Install a new diaphragm; then turn the crankshaft to bring the piston to its down-stroke and seat the diaphragm into the sleeve groove.

6. Install the washer and bolts removed in steps 3 and 4.

7. Replace the pulsation dampener diaphragm by first bleeding the air from the dampener. Remove the bolts from the dampener cover and replace the diaphragm. Reassemble the cover in place and charge the dampener to 20% of operating pressure.

8. Refill the crankcase with 30W non-detergent oil. Rotate the shaft to distribute the oil and fill to proper level.

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**Diaphragm Replacement D50**

Change diaphragms every 500 hours or three months whichever comes first.

1. Drain the oil from crankcase as instructed previously.

2. Remove the pump manifolds and valves.

3. Remove the pump head retaining nuts and heads.

4. Turn the crankshaft to bring the diaphragm to the top of its stroke. Insert a drift pin into the hole in the retaining bolt to hold it in place. Remove the retaining nut, retaining washer and the diaphragm. (See Figure above).

5. Turn the crank shaft to bring the piston to the bottom of its stroke and seat the new diaphragm into the sleeve groove. Install the retaining washer and tighten the retaining nut while holding the retaining stud in place with the drift pin. Clean any excess oil from the area and install the heads, valves and manifolds.

6. Replace the pulsation dampener diaphragm by first bleeding the air from the dampener. Remove the cover retaining bolts from the dampener cover and replace the diaphragms. Reassemble the cover and bolts in place and charge the dampener to 20% of operating pressure.

7. Refill the crankcase with 30W non-detergent oil. Rotate shaft to distribute oil and fill to proper level.

**Winter Storage/Freezing Conditions**

1. Drain water from main tank

2. Open all valves.

3. Flush pump with a 50/50 mixture of water and antifreeze while rotating crankshaft.
<table>
<thead>
<tr>
<th>Symptom</th>
<th>Probable Cause</th>
<th>Corrective Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>The pump does not draw fluid</td>
<td>Pump is drawing air</td>
<td>Turn redirect valve handle 90°</td>
</tr>
<tr>
<td></td>
<td>One or more pump valves are not seating properly.</td>
<td>Remove valve (s) and check for debris.</td>
</tr>
<tr>
<td></td>
<td>Suction line is plugged or collapsed.</td>
<td>Examine suction hose for blockage</td>
</tr>
<tr>
<td></td>
<td>Clogged debris filter</td>
<td>Clean debris filter.</td>
</tr>
<tr>
<td>The liquid flow is erratic</td>
<td>The change in the pulsation dampener is incorrect</td>
<td>Check pressure in pulsation dampener (20-40% working pressure).</td>
</tr>
<tr>
<td></td>
<td>One or more pump valves are not seating properly</td>
<td>Remove valve (s) and check for debris. Check and clean valve seats.</td>
</tr>
<tr>
<td>Output drops and pump is noisy</td>
<td>Oil level is too low</td>
<td>Add 30W motor oil to bring level half way up sight glass.</td>
</tr>
<tr>
<td>Oil comes out the discharge port or oil is a milky color</td>
<td>One or more diaphragms split</td>
<td>Replace diaphragm (s). (Refer to Maintenance Section).</td>
</tr>
<tr>
<td>Pump seems to operate in reverse</td>
<td>Electric motor wired backwards</td>
<td>Have a certified electrician check and repair wiring.</td>
</tr>
<tr>
<td>Agitation shaft bearing leaking</td>
<td>Packing gland loose</td>
<td>Tighten packing nut on front Replace with 1/4&quot; Teflon packing.</td>
</tr>
<tr>
<td></td>
<td>Worn out packing material</td>
<td>Increase fresh water bypass GPM.</td>
</tr>
<tr>
<td>Irrigation filters plugging or require frequent flushing</td>
<td>Injecting too thick of of slurry</td>
<td>Install a screen on the incoming fresh water line.</td>
</tr>
<tr>
<td></td>
<td>Poor quality gypsum Fresh water is contaminated</td>
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Solution Gypsum Specifications

Caution: This SDI machine was designed for use with true solution grade gypsum only. Use of sub-standard gypsum:

- Causes excessive wear to the pump, pump valves, pressure relief valve, pressure orifice, ball valves, micro sprinklers, emitters, etc.
- Impacts filters—requiring more frequent flushing.
- May not go into true solution and could build up inside irrigation lines
- May void the factory warranty.

To avoid these problems, we recommend using Solution Grade Gypsum with a minimum analysis of:

Purity: Average—95%
(92% Guaranteed).

Grind: 100% thru 200 mesh,
95% passes thru 325 mesh

Never Use:

Anhydrous Gypsum (Anhydrite)
Agricultural Grade/Spreadable Gypsum
Ground up (Wallboard) Gypsum

*Refer to the Gypsum Application Rate Chart on the following page*
### Gypsum Application Rate Chart

#### SDI’s Inject-a-Cure Solution Injection

<table>
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<th>1 MEQ</th>
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Continued on following page.

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Page 18
### Gypsum Application Rate Chart

#### SDI's Inject-a-Cure Solution Injection

- **Lbs./Hour vs Meq/L**

<table>
<thead>
<tr>
<th>1 Meq GPM</th>
<th>2 Meq GPM</th>
<th>3 Meq GPM</th>
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Page 19
### Discharge Rate Chart

**SDI’s Inject-a-Cure Solution Injection**

<table>
<thead>
<tr>
<th>Amendment Application Rate Lbs./Hour</th>
<th>6 lbs. Dry/Gallon</th>
<th>5 lbs. Dry/Gallon</th>
<th>4 lbs. Dry/Gallon</th>
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Refer to the “Gypsum Application Rate Chart.” Find your irrigation flow rate (in GPM) under the desired treatment level (MEQ) to determine the gypsum application rate (LBS/HOUR). Then:

1. Find the closest Lbs./Hour rate in the left hand column above.
2. Follow the table to the right under the column which reflects the Slurry Mix in the tank (Dry Pounds/Gallon).
3. Read the number indicated as the Discharge Gallons Per Minute (the GPM of slurry to be injected).

**Sample: Setting slurry discharge for gypsum.** (Mixed in the tank at the recommended rate of 4 Lbs. gypsum/gallon of water).

Desired gypsum application = 240 Lbs./Hour. Find 240 in the left column, then follow it to the right under “4 lbs. Dry/Gallon”.

Read Discharge Gallons/Minute = 1.00. Therefore, fresh water bypass should be opened fully, then reduced by 1 gallon per minute.
Compatible Amendments—Application Chart:

** The following dry materials are compatible with the “Inject-a-Cure” Solution Injection System*

- **Always** put gypsum into mixing tank first when combining with other amendments.
- **Never** combine the listed amendments that are shown as Do Not Mix - gypsum.
- **Never** combine Phosphate based products with calcium.
- **Always Test** a small sample of any and all amendments for compatibility with gypsum, *even if known* to be compatible, before loading in the Inject-a-Cure for mixing. SDI is not responsible for any damage if you have a compatibility problem with adding any amendments with gypsum in the Inject-a-Cure. Please contact your amendment supplier for amendment compatibility assurance.

600 Gallon Unit/300 Gallon Unit

Solution Grade Gypsum, alone: 3,000 lbs./1,500 lbs. Max.**

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<th>Without Gypsum</th>
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<td></td>
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<td>Humic Acid</td>
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*Caution: The above amendments are compatible with the construction of the “Inject-a-Cure” injection machine only when purchased in a form appropriate for direct injection. Always be sure to confirm with the amendment supplier, that what you are buying is suitable for injection directly into irrigation water.

Failure to do so may cause improper operation and/or damage to the injection machine which is not covered by the manufacturer’s warranty. Use of a sub-standard quality of solution grade gypsum can reduce the maximum by as much as 25%. **Limestone must be ground to at least 325 mesh minus. Consult your supplier for details.
Optional Equipment
Operation and Maintenance

Auxiliary Fill Pump
Used to fill the main mixing tank from a ditch or pond, the auxiliary fill pump is self-priming, centrifugal style pump, providing a high volume of water at a relatively low pressure. It operates by a direct-drive belt from the motor's pulley, so the pump is working at all times when the injection unit is operating.

To fill the tank:
1. Check that a suction hose is installed and that the free end is submerged in water. A debris screen should be attached to prevent large debris from being sucked into the pump. When drawing water from a pond, use a floating suction device to pump water from near the top of the pond, to prevent sand, direct and/or other debris from entering the pump and mixing tank.
2. With the irrigation machine on, turn Fill Valve to the open position. This allows the auxiliary fill pump to begin filling the main tank.
3. When the mixing tank is full, a float valve will automatically shut off the incoming water to prevent the tank from overflowing. You may then leave the Fill Valve open, for maintaining a continuous level of fluid in the machine, or you may turn off the valve and allow the mixing tank to pump down for flood and other uncontrolled irrigation applications.

Caution:
The centrifugal pump continues to turn even if the Fill Valve is closed. A small fresh water bypass tube is connected between the centrifugal pump and the main tank, allowing a very small amount of fresh water to circulate, to prevent the pump from overheating.
You must keep the suction hose submerged at all times during operation.

Failure to do so, will allow the auxiliary pump to run dry and cause the pump to burn up. Also, check the small bypass tube on a regular basis to insure that it has not become clogged by debris. Damage resulting from running the pump dry or running too hot is not covered under the factory warranty.

For winter storage, be sure to drain all water from the pump and flush with a 50/50 mixture of water and anti-freeze.

Miscellaneous Conversion Data

General
1 Acre = 43,560 Square Feet
1 Acre Foot = 43,560 Cubic Feet (ft³)

Water
1 Cubic Foot (ft³) = 7.48 Gallons
1 Acre Foot = 325,829 Gallons
1 Acre Inch = 27,251 Gallons
1 Liter x 0.265 = Gallons
Gallons x 3.78 = Liters
Gallons/325,829 = Acre Feet
Acre Feet x 325,829 = Gallons

Water Flow
3 Acres x Depth (inches) = Acre Feet
A1 x 27,152 = Total Gallons
TG/GPM = Irrigation Hours

Gypsum Application Rates—Soil
Recommended tons/acre x acres to treat/2 = Total Gypsum Requirement

TGR/Ox = Total tons gypsum needed for injecting. (x=gypsum purity percentage. i.e. 50, 75, 92, etc.)

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TTG x 2,000 — Total Pounds Gypsum
TPG/.0043 = Total Gallons[TG/GPM/60
= Total hours of irrigation for full
application in shortest time.

**Gypsum Application Rates** — Water
Pounds Per Acre Foot/325,829 = Pounds
Per Gallon Treatment Rate
Millequivalents per liter (meq/ltr x
0.00716 = Pounds Per Gallon
Treatment
PPG x GPM x 60 = Pounds Per Hour
Application Rate
PPG x 325,829 = Pounds Per Acre Foot
Application Rate

**Fresh Water Bypass Operation**

The high pressure pump will first draw
from the fresh water line. The amount of
slurry injected is determined simply by
setting the fresh water flow to the
pump’s maximum capacity, then reduc-
ing the fresh water GPM by the amount
of slurry desired. The pump will then
automatically withdraw the difference
from the mixing tank.

**Maximum Pump Capacity-Fresh
Water Flow** = Net amount of gypsum
slurry injected.

**Example**: Desired slurry output is de-
termined to be 2 GPM. Maximum pump
capacity is 6 GPM.
1. With the machine running, the fresh
water valve is opened until the
pump’s maximum GPM rate is
achieved (6 GPM in this example).
2. Since the desired slurry output is 2
GPM, slowly close the fresh water valve until the fresh water flow
meter reads 2 GPM less (6-2=4 in this
example).
3. With the fresh water restricted to
only 4 GPM, the positive displace-
ment pump will automatically make
up the difference by withdrawing 2
GPM from the Mixing Tank.

**Main Advantage**: Able to put more
gypsum in mixing tank, less wear and
tear on pump, eliminates pressure relief
valve and makes adjusting desired output
much simpler.