Solution Gypsum Specifications

Refer to the Gypsum Application Rate Chart on Page 18.

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

Gypsum Application Rate Chart

SDI's Inject-a-Cure
Solution Injection

LBS./HOUR vs. MEQ/L

1MEQ		2MEQ		3MEQ		4MEQ		5MEQ		6MEQ	
GPM	LB/HR	GPM	LB/HR	GPM	LB/HR	GPM	LB/HR	GPM	LB/HR	GPM	LB/HR
100	4	100	9	100	13	100	17	100	22	100	26
150	6	150	13	150	19	150	26	150	32	150	39
200	9	200	17	200	26	200	35	200	43	200	52
250	11	250	22	250	32	250	43	250	54	250	65
300	13	300	26	300	39	300	52	300	65	300	78
350	15	350	30	350	45	350	60	350	76	350	91
400	17	400	35	400	52	400	69	400	86	400	104
450	19	450	39	450	58	450	78	450	97	450	117
500	22	500	43	500	65	500	86	500	108	500	130
550	24	550	48	550	71	550	95	550	119	550	143
600	26	600	52	600	78	600	104	600	130	600	156
650	28	650	56	650	84	650	112	650	140	650	168
700	30	700	60	700	91	700	121	700	151	700	181
750	32	750	65	750	97	750	130	750	162	750	194
800	35	800	69	800	104	800	138	800	173	800	207
850	37	850	73	850	110	850	147	850	184	850	220
900	39	900	78	900	117	900	156	900	194	900	233
950	41	950	82	950	123	950	164	950	205	950	246
1000	43	1000	86	1000	130	1000	173	1000	216	1000	259
1050	45	1050	91	1050	136	1050	181	1050	227	1050	272
1100	48	1100	95	1100	143	1100	190	1100	238	1100	285
1150	50	1150	99	1150	149	1150	199	1150	248	1150	298
1200	52	1200	104	1200	156	1200	207	1200	259	1200	311
1250	54	1250	108	1250	162	1250	216	1250	270	1250	324
1300	56	1300	112	1300	168	1300	225	1300	281	1300	337
1350	58	1350	117	1350	175	1350	233	1350	292	1350	350
1400	60	1400	121	1400	181	1400	242	1400	302	1400	363
1450	63	1450	125	1450	188	1450	251	1450	313	1450	376
1500	65	1500	130	1500	194	1500	259	1500	324	1500	389
1550	67	1550	134	1550	201	1550	268	1550	335	1550	402
1600	69	1600	138	1600	207	1600	276	1600	346	1600	415
1650	71	1650	143	1650	214	1650	285	1650	356	1650	428
1700	73	1700	147	1700	220	1700	294	1700	367	1700	441
1750	76	1750	151	1750	227	1750	302	1750	378	1750	454
1800	78	1800	156	1800	233	1800	311	1800	389	1800	467
1850	80	1850	160	1850	240	1850	320	1850	400	1850	480
1900	82	1900	164	1900	246	1900	328	1900	410	1900	492
1950	84	1950	168	1950	253	1950	337	1950	421	1950	505
2000	86	2000	173	2000	259	2000	346	2000	432	2000	518
2050	89	2050	177	2050	266	2050	354	2050	443	2050	531
2100	91	2100	181	2100	272	2100	363	2100	454	2100	544
2150	93	2150	186	2150	279	2150	372	2150	464	2150	557
2200	95	2200	190	2200	285	2200	380	2200	475	2200	570
2250	97	2250	194	2250	292	2250	389	2250	486	2250	583
2300	99	2300	199	2300	298	2300	397	2300	497	2300	596
2350	102	2350	203	2350	305	2350	406	2350	508	2350	609
2400	104	2400	207	2400	311	2400	415	2400	518	2400	622
2450	106	2450	212	2450	318	2450	423	2450	529	2450	635
2500	108	2500	216	2500	324	2500	432	2500	540	2500	648
2550	110	2550	220	2550	330	2550	441	2550	551	2550	661
2600	112	2600	225	2600	337	2600	449	2600	562	2600	674
2650	114	2650	229	2650	343	2650	458	2650	572	2650	687
2700	117	2700	233	2700	350	2700	467	2700	583	2700	700
2750	119	2750	238	2750	356	2750	475	2750	594	2750	713
2800	121	2800	242	2800	363	2800	484	2800	605	2800	726
2850	123	2850	246	2850	369	2850	492	2850	616	2850	739
2900	125	2900	251	2900	376	2900	501	2900	626	2900	752
2950	127	2950	255	2950	382	2950	510	2950	637	2950	765

Discharge Rate Chart

SDI's Inject-a-Cure
Solution Injection

AMENDMENT APPLICATION RATE Lbs./Hour	DISCHARGE RATE in gallons per minute GPM (Discharge Gallons/Minute) @ Slurry Mix (Dry Lbs./Gallon)					
	6 lbs. Dry/Gallon	5 lbs. Dry/Gallon	4 lbs. Dry/Gallon	3 lbs. Dry/Gallon	2 lbs. Dry/Gallon	1 lbs. Dry/Gallon
60	.16	.20	.25	.33	.50	1.00
120	.33	.50	.50	.66	1.00	2.00
180	.50	.60	.75	1.00	1.50	3.00
240	.66	.80	1.00	1.33	2.00	4.00
300	.83	1.00	1.25	1.66	2.50	5.00
360	1.00	1.20	1.50	2.00	3.00	6.00
420	1.16	1.40	1.75	2.33	3.50	7.00
480	1.33	1.60	2.00	2.66	4.00	8.00
540	1.50	1.80	2.25	3.00	4.50	9.00
600	1.66	2.00	2.50	3.33	5.00	10.00
660	1.83	2.20	2.75	3.66	5.50	11.00
720	2.00	2.50	3.00	4.00	6.00	12.00
780	2.16	2.60	3.25	4.33	6.50	13.00
840	2.33	2.80	3.50	4.66	7.00	14.00
900	2.50	3.00	3.75	5.00	7.50	15.00
960	2.66	3.20	4.00	5.33	8.00	16.00

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 g.p.m. 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

SDI's Inject-a-Cure
Solution Injection

The following dry materials can be used in the SDI 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*** **- with Gypsum.**
- ***Never*** **combine Phosphate based products with Calcium.**
- ***(Always Test)*** **a small sample of any and all amendments for compatability 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.**

300 GALLON UNIT

Solution Grade Gypsum, alone: 1,500 lbs. (680 Kgs) **Max.****

	Mixed With Gypsum		*Without Gypsum*	
Description	**Lbs.**	**Kgs**	**Lbs.**	**Kgs**
Amonium Nitrate	500	227	1800	818
Amonium Sulfate	200	91	1000	455
Calcium Nitrate	200	91	2000	910
Humic Acid	15 gal		15 gal	
Milled Limestone* **	— *Do Not Mix* —		200	91
Magnesium Sulfate	50	23	50	23
Potassium Sulfate (Potash)	— *Do Not Mix* —		600	273
Potassium Nitrate	200	91	600	273
Zinc Sulfate	50	23	50	23
10-62-0	— *Do Not Mix* —		1200	546

600 GALLON UNIT

Solution Grade Gypsum, alone: 3,000 lbs. (1,360 Kgs) **Max.****

	Mixed With Gypsum		*Without Gypsum*	
Description	**Lbs.**	**Kgs**	**Lbs.**	**Kgs**
Amonium Nitrate	1000	454	3600	1636
Amonium Sulfate	400	182	2000	910
Calcium Nitrate	400	182	4000	1820
Humic Acid	35 gal		35 gal	
Milled Limestone* **	— *Do Not Mix* —		400	182
Magnesium Sulfate	100	46	100	46
Potassium Sulfate (Potash)	— *Do Not Mix* —		1200	546
Potassium Nitrate	400	182	1200	546
Zinc Sulfate	100	46	100	46
10-62-0	— ***Do Not Mix* —		2400	1092

***CAUTION:** The above amendments are compatible with the construction of the SDI Injection machine **only** when purchased in a form appropriate for direct injection. Therefore, 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. If you are unsure about an item, please call (559)SDI-5555 *prior to using the material.* 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 attached and that the free end is submerged in water. A debris screen should be attached to prevent large debris from bing 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, dirt and/or other debris from entering the pump and mixing tank.

2. With the injection 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 continue circulating, 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 ensure 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.*

An optional hinge assembly is available to disengage the auxiliary pump when not needed in applications where this might be a problem. Contact your SDI representative for details.

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

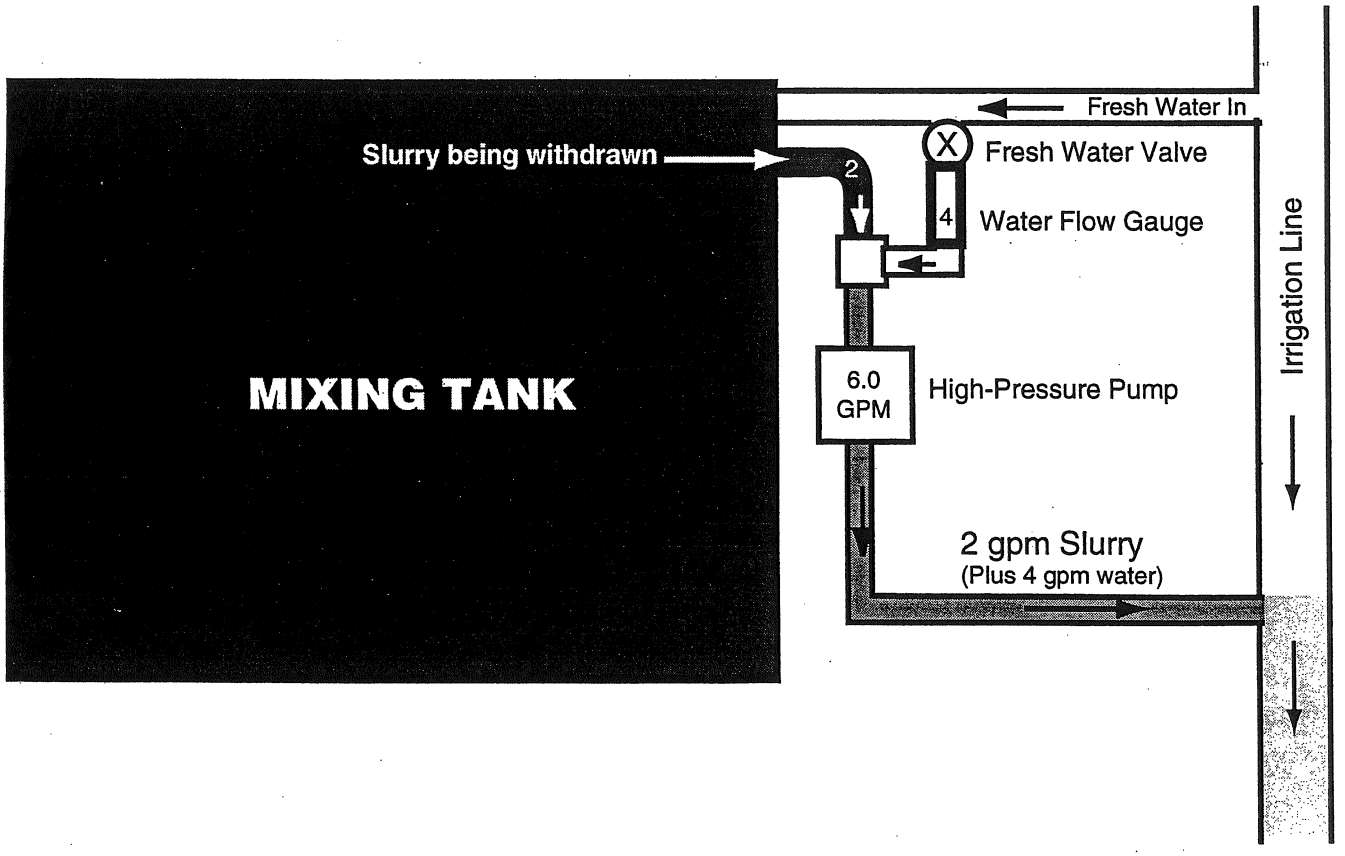
Fresh Water Bypass Operation

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 pumps maximum capacity, then reducing 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 determined to be 2 gpm. Maxium 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 gpm in this example.)
3. With the fresh water restricted to only 4 gpm, the positive displacement pump will automatically make up the difference by withdrawing 2 gpm from the Mixing Tank.



MAIN ADVANTAGES: 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.

Miscellaneous Conversion Data

General:

One Acre = 43,560 Square Feet
One Acre Foot = 43,560 Cubic Feet (ft^3)

Water:

One Cubic Foot (ft^3) = 7.48 Gallons
One Acre Foot = 325,829 Gallons
One Acre Inch = 27,152 Gallons

One 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 Inches
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/0.*x* = Total Tons Gypsum needed for injecting. (*x* = gypsum purity percentage. i.e., 50, 75, 92, etc.).
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.
Milliequivalents per liter (meq/ltr) x .000716 = Pounds Per Gallon Treatment
PPG x GPM x 60 = Pounds Per Hour Application Rate.
PPG x 325,829 = Pounds Per Acre Foot Application Rate.

Additional Information/Notes/Comments