UNISORB®
INSTALLATION TECHNOLOGIES

DATA SHEET

V-1® GROUT FOR WIND TOWERS

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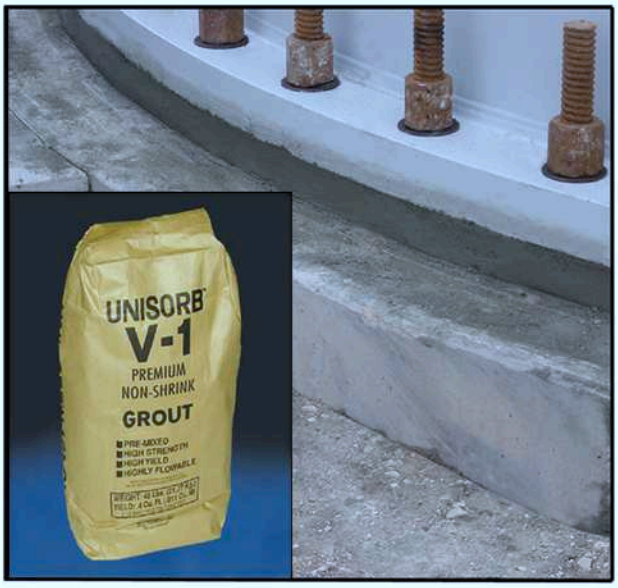
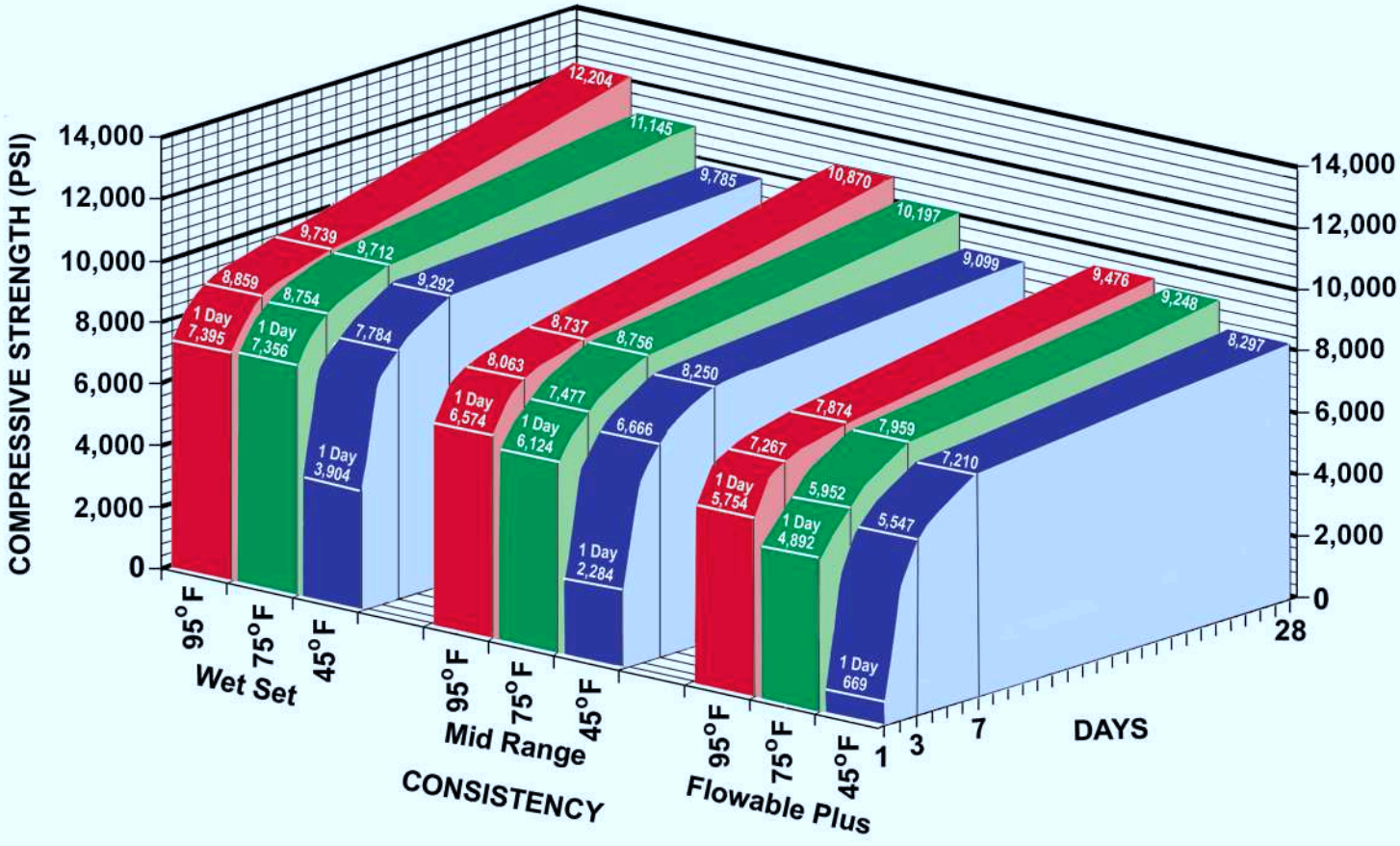


- *Exceeds ASTM C-1107 Requirements*
- *Up to 12,200 psi compressive strength*
- *Proven on thousands of wind turbine bases*
- *Controlled expansion*
- *Can be pumped and vibrated*
- *Easy mixing and clean up*
- *Qualifies for 3 LEED points*
- *Most experienced field support team in the industry*

V-1® NON-SHRINK GROUT
Typical Field Results



A cement-based, non-shrink, premixed, highly flowable grout that develops extremely high compressive strengths in a very short period of time.

This product is particularly superior for applications where ease of placement and suitability for use under high unit loads are important. Other materials such as concrete or weaker grouts may develop structural flaws when subjected to concentrated loads.

Unisorb cementitious V-1 Non-Shrink Grout is uniquely suited for Wind Farm applications. It has outstanding wet-set properties and can also be mixed flowable when used with forms. Both methods will provide superior results. Contact Unisorb to learn more about the proper methods for your application, and available training options.

V-1 Non-Shrink Grout is ideally suited for the following purposes:

- Setting wind turbine towers
- Setting turbine base plates
- Grouting of precision machinery
- Setting precision leveling wedges
- Setting high strength anchor bolts
- Grouting of large base plates
- Grouting in machine bases

This product contains a special proprietary expansion mechanism which eliminates the natural volume loss present in other cement-based products. This expansion mechanism is totally unique in the grouting industry because it expands primarily during the initial set stages of the cure, thereby yielding a very stable end product. Controlled expansion precludes the possibility of shrinkage related voids so that full bearing contact is ensured. Many grout manufacturers today use a metallic expansion mechanism that may not be completely consumed during the cure stage. This can lead to reactivation of this material in a wet environment and create strong internal pressures that can promote premature failure. Since cured V-1 grout does not contain metallic expansion agents or allow excessive air entrapment, it does not require a post-cure coating to protect it from a wet environment.

V-1 grout is well suited for use in ambient temperatures and is routinely used in areas where temperatures reach 1,000° F. It also exhibits superior resistance to attack by strong acids and chemical bases.

V-1 grout is a very dense and stable material after proper cure. It provides long life expectancy and maintains the rigid machine-to-foundation connection required to meet the precise installation requirements of today's sophisicated equipment.

PERFORMANCE ADVANTAGES

V-1 grout is composed of several carefully blended sizes of the best quality pure silica sand, "high-early" portland cement and a proprietary controlled expansion mechanism. It is chloride-free and will not shrink below its original mixing volume after the recommended water ratio is added. This grout can be extended by adding up to 50% (by weight) pea gravel, substantially reducing material costs on larger pours. V-1 grout can be pumped or vibrated without risk of separation.

SPECIFICATION CONFORMANCE

V-1 grout exceeds all the requirements of ASTM C-1107, and qualifies for 3 LEED points.

TEMPERATURE CONSIDERATIONS

Use standard high temperature concreting techniques for temperatures over 90° F and low temperature techniques below 45° F.

PACKAGING/YIELD
48# Bag = .40 cu. ft. (691 cu. in.)

Consult the specific Matrerial Safety Data Sheets (MSDS) for all safety data.

TYPICAL FIELD RESULTS

PHYSICAL PROPERTIES									
Type of Grout Mixture	**Wet Set**			**Mid Range**			**Flowable Plus**		
Mix Ratio Water per 48 lb. bag	3.1 quarts			3.6 quarts			4.0 quarts		
Ambient temperature at mixing	45° F	75° F	95° F	45° F	75° F	95° F	45° F	75° F	95° F
Flow Consistency Flow Table (5 drops) ASTM C-1437	94	45	29	145	125	80	150+	150+	123
Compressive Strength (psi) per ASTM C-109									
Test Age									
1 Day	3,904	7,356	7,395	2,284	6,124	7,356	669	4,892	5,754
2 Days	7,786	8,271	8,376	5,759	6,942	7,672	4,292	5,613	6,898
3 Days	7,784	8,754	8,859	6,666	7,477	8,737	5,547	5,952	7,267
7 Days	9,292	9,712	9,739	8,250	8,756	8,737	7,210	7,959	7,874
28 Days	9,785	11,145	12,264	9,099	10,197	10,870	8,297	9,248	9,476
Vicat Needle Test per ASTM C-191									
Initial Set	5.00 hr.	3.10 hr.	0.67 hr.	6.67	5.00	1.50	8.23 hr.	6.76 hr.	2.00 hr.
Final Set	6.50 hr.	4.60 hr.	1.10 hr.	8.10	6.50	2.10	9.75 hr.	7.25 hr.	3.10 hr.

Physical properties shown are the result of laboratory testing performed per industry recognized test procedures. Laboratory properties aid in determining suitability of the product for the intended application. Field test results may vary due to procedures or ambient conditions such as temperature and humidity. Laboratory reports are available on request.

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