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## BINDEX™ BFM INSTALLATION GUIDELINES

Before hydraulically applying Bindex BFM (Bonded Fiber Matrix), the site shall be inspected by the Owner's Representative to ensure the area to be protected is geotechnically stable. In addition, areas to be protected should be designed to prevent run-on conditions. Bindex BFM shall not be used in channels or areas of concentrated flow. The contractor shall proceed when all satisfactory conditions are present.

Each bag [≈ 50 lb (22.7 kg)] of Bindex BFM should be mixed with approximately 100 gallons (378.5 L) of water and applied at a rate of 3,000 – 4,200 lb/acre (3,362 – 4,707 kg/ha). See “Bindex BFM Topographic Index Guide” for application rates by slope gradient and soil conditions. See “Bindex Loading Chart” for details on mixing procedures. Mixing and application rates shall always be matched to project-specific specifications.

Apply Bindex BFM from two directions for best coverage results. Bindex BFM shall not be applied immediately before, during or after rainfall, such that the matrix will have opportunity to dry for up to 24 hours after installation. Bindex BFM should not be applied to saturated soil. If conditions are marginal (or it is difficult to predict the weather) apply only a light application [about 1,000 lb/acre (1,120 kg/ha)] and reapply the remainder when conditions improve (this technique allows crews to keep busy during periods of marginal weather without risking the whole application). Bindex BFM can be very effective when built up in layers without compromising the final quality or performance.

Curlex® Sediment Log® for slope interruption should be used in conjunction with Bindex BFM when slope length exceeds 75 ft (22.9 m).

See “4 Tips for Installing Bindex BFM” for additional details on installing this product.



# BINDEX™ BFM

## TOPOGRAPHIC INDEX GUIDE

The purpose of the Topographic Index Guide (TIG) is to provide a more accurate estimate of the surface area to be treated with hydraulic applications. Using the TIG, designers and contractors can take into account surface conditions that will require an increase in hydraulic components in order to gain effective coverage at the rate of material specified.

### **Explanation of Effective Area/Effective Coverage**

It is important to understand that although the effective area increases due to the greater accuracy in estimation using the TIG, the amount of hydraulic material applied per unit area remains the same. For example:

On a 5H:1V slope of standard loam soil, a 3,000 lb/acre application of Bindex BFM is appropriate for effective coverage (See Table); however, If that same 5H:1V slope has been track-walked/furrowed, the surface area increases by 20%, which requires an additional 600 lb/acre (3,600 lb/acre total) of Bindex BFM to achieve effective coverage (See Table).

Similarly, areas estimated from plan view will always be less than actual effective area if slope gradient is not taken into consideration. A 3H:1V slope increases effective area needing treatment by 6%, a 2H:1V slope by 12%, etc. (See Table).

### **Cumulative Impact: Using the TIG to Estimate Application Rates**

As can be seen in the table, the effects of slope gradient and surface texture are cumulative; in other words, the increase in surface area due to slope gradient is added to the increase in surface area due to a topographic factor. Some adjustments have been made in the estimated based on the actual field trials. Using the TIG is a simple, three step process:

1. Estimate the slope gradient (i.e. 4H:1V, 3H:1V, 2H:1V, stepped, etc.) and find the appropriate category on the left side of the table (Slope Gradient);
2. Find the texture condition that best describes the soil surface i.e. Standard Loam, Chiseled, Sheeps-foot roller, etc. (Topographic Factor);
3. The Bindex BFM application rate and percent increase in surface area (in parentheses) are found where the Slope Gradient row and Topographic Factor column intercept.



# Bindex™ BFM

## Topographic Index Guide

Values in table are pounds per acre of Bindex BFM and (percent increase from 3,000 lb/acre)

Slope Gradient	Topographic Factor								
	Standard Loam	High Silt	Non-Cohesive Sand	Loose Gravel (C-2 in)	Chiseled or Disked	Medium Gravel (2-4 in)	Track-Walked/Furrow	Cobble (4-6 in)	Sheeps-Foot Roller
5H:1V or Flatter	3,000 (0)	3,300 (10)	3,300 (10)	3,450 (15)	3,450 (15)	3,600 (20)	3,600 (20)	3,750 (25)	3,750 (25)
4H:1V	3,100 (3)	3,350 (12)	3,350 (12)	3,500 (17)	3,500 (17)	3,600 (21)	3,600 (21)	3,800 (27)	3,800 (27)
3H:1V	3,200 (6)	3,500 (15)	3,500 (15)	3,600 (20)	3,600 (20)	3,700 (25)	3,700 (25)	3,900 (30)	3,900 (30)
2H:1V	3,350 (12)	3,550 (18)	3,550 (18)	3,750 (25)	3,750 (25)	3,900 (30)	3,900 (30)	4,050 (35)	4,050 (35)
1.5H:1V	3,600 (20)	3,600 (20)	3,600 (20)	3,900 (30)	3,900 (30)	4,050 (35)	4,050 (35)	4,200 (40)	4,200 (40)
1H:1V	4,200 (40) Split Application	4,200 (40) Split Application	4,200 (40) Split Application						
4H:1V Stepped	3,600 (20)								
3H:1V Stepped	3,750 (25)								
2H:1V Stepped	4,050 (35)								
1H:1V Stepped	4,200 (40)								



## BINDEX™ BFM LOADING CHART

Bindex ≈ 50 lb Bags	Water		Mixing Volume		Ground Coverage Based on 3000 lb/ac Rate			
	Gallons	(Liters)	Gals.	(Liters)	Sq. Feet	(Sq. Meters)	Acres	(hectares)
1	100	(378.54)	108	(408.82)	725	(67.35)	0.017	(0.007)
2	200	(757.08)	216	(817.65)	1,450	(134.71)	0.033	(0.013)
3	300	(1,135.62)	324	(1,226.47)	2,175	(202.06)	0.050	(0.020)
4	400	(1,514.16)	432	(1,635.30)	2,900	(269.41)	0.067	(0.027)
5	500	(1,892.71)	540	(2,044.12)	3,625	(336.76)	0.083	(0.034)
6	600	(2,271.25)	648	(2,452.95)	4,350	(404.12)	0.100	(0.040)
7	700	(2,949.79)	756	(2,861.77)	5,075	(471.47)	0.116	(0.047)
8	800	(3,028.33)	864	(3,272.59)	5,800	(538.82)	0.133	(0.054)
9	900	(3,406.87)	972	(3,679.42)	6,525	(606.17)	0.150	(0.061)
10	1,000	(3,785.41)	1,080	(4,088.24)	7,250	(673.53)	0.166	(0.067)
11	1,100	(4,163.95)	1,188	(4,497.06)	7,975	(740.88)	0.183	(0.074)
12	1,200	(4,542.49)	1,296	(4,905.89)	8,700	(808.23)	0.200	(0.081)
13	1,300	(4,921.03)	1,404	(5,314.72)	9,425	(875.58)	0.216	(0.088)
14	1,400	(5,299.57)	1,512	(5,723.54)	1,0150	(942.94)	0.233	(0.094)
15	1,500	(5,678.12)	1,620	(6,132.36)	1,0875	(1,010.29)	0.250	(0.101)
16	1,600	(6,056.66)	1,728	(6,541.19)	1,1600	(1,077.64)	0.266	(0.108)
17	1,700	(6,435.20)	1,836	(6,950.01)	1,2325	(1,144.99)	0.283	(0.115)
18	1,800	(6,813.74)	1,944	(7,353.84)	1,3050	(1,212.35)	0.300	(0.121)
19	1,900	(7,192.28)	2,052	(7,767.66)	1,3775	(1,279.70)	0.316	(0.128)
20	2,000	(7,570.82)	2,160	(8,176.49)	1,4500	(1,347.05)	0.333	(0.135)
21	2,100	(7,949.36)	2,268	(8,585.31)	1,5225	(1,414.40)	0.350	(0.141)
22	2,200	(8,327.90)	2,376	(8,994.13)	1,5950	(1,481.76)	0.366	(0.148)
23	2,300	(8,706.44)	2,484	(9,402.96)	1,6675	(1,549.11)	0.383	(0.155)
24	2,400	(9,084.98)	2,592	(9,811.78)	1,7400	(1,616.46)	0.400	(0.162)
25	2,500	(9,463.53)	2,700	(1,0220.61)	1,8125	(1,683.81)	0.417	(0.169)
26	2,600	(9,842.07)	2,808	(1,0629.43)	1,8850	(1,751.16)	0.433	(0.175)
27	2,700	(1,0220.61)	2,916	(1,1038.26)	1,9575	(1,818.51)	0.450	(0.182)
28	2,800	(1,0599.15)	3,024	(1,1447.08)	2,0300	(1,885.86)	0.467	(0.189)
29	2,900	(1,0977.69)	3,132	(1,1855.90)	2,1025	(1,953.21)	0.483	(0.196)
30	3,000	(1,1356.23)	3,240	(1,2264.73)	2,1750	(2,020.56)	0.500	(0.202)

### Estimate Your Number of Bags

#### Based on rates in lb/acre

- A. Multiply total square feet to be covered by the desired mulch application rate in lb/acre.
- B. Divide the answer received in A by 43,560 ft<sup>2</sup> (ft<sup>2</sup> in an acre).
- C. Divide answer received in B by lb/bag, which will be the number of bags needed for the coverage area.

#### Based on rates in kg/ha

- A. Multiply total square meters to be covered by the desired mulch application rate in kg/ha.
- B. Divide the answer received in A by 4,047 m<sup>2</sup> (m<sup>2</sup> in a hectare).
- C. Divide answer received in B by kg/bag, which will be the number of bags needed for the coverage area.



## Height (in inches) Measured from Top of Tank

Bags of Bindex	Mix Volume (gal)	FINN T60	FINN T90	FINN T120	FINN T170	FINN T280	FINN T330	Bowie 500	Bowie 800	Bowie 1100	Bowie 1500	Bowie 2500	Bowie 3000	Kincaid 425	Kincaid 700	Kincaid 900	Kincaid 1200
1	108	26.0	32.0					25.5	35.0					24.0	28.0	28.5	37.5
2	216	21.0	27.0					7.5	31.0					16.0	22.5	23.5	32.5
3	324	15.0	24.0					9.5	25.5	28.0				9.0	17.5	19.0	28.0
4	432	8.5	19.0	27.0	32.0			5.5	21.0	24.0	29.5			0	13.0	15.0	24.0
5	540	3.5	15.0	23.0	29.0			1.0	16.0	19.5	26.0				8.5	11.5	20.0
6	648		10.0	15.0	25.0				11.0	15.0	23.5				4.0	8.5	17.0
7	756		6.0	12.0	22.5	37.5			4.5	11.0	21.0	34.0				5.0	14.0
8	864		2.0	9.5	21.0	36.5			1.0	8.0	19.0	33.0				1.0	10.5
9	972			7.0	18.5	34.5				4.0	17.0	31.0					7.0
10	1,080			3.5	16.0	32.0	35.0			2.0	15.5	28.5	35.5				3.5
11	1,188				13.0	29.5	33.0				13.0	26.0	33.0				
12	1,296				10.0	28.5	31.6				10.0	24.5	31.5				
13	1,404				8.5	27.0	30.0				7.5	23.0	30.0				
14	1,512				6.0	25.0	28.5				4.5	21.0	28.0				
15	1,620				4.0	22.5	27.0				2.0	19.5	25.5				
16	1,728					20.0	25.5					16.5	24.0				
17	1,836					17.0	24.0					14.5	22.0				
18	1,944					15.0	22.5					12.5	21.0				
19	2,052					14.0	21.0					10.5	18.0				
20	2,160					12.5	18.5					9.0	16.5				
21	2,268					10.0	17.0					7.0	15.0				
22	2,376					7.0	15.5					5.0	13.0				
23	2,484					5.5	14.0					3.5	10.5				
24	2,259					4.0	12.0					2.0	9.5				
25	2,700					2.5	10.0					0.0	7.5				
26	2,808						8.5						6.0				
27	2,916						6.5						4.5				
28	3,024						4.0						3.0				
29	3,132						2.5						1.5				
30	3,240						1.0						0.0				



## Mixing Procedures:

1. Pre-mixing: Purge pump, pipe, boom, and hose with clear water .
2. Consult chart to determine number of Bindex BFM bags required to cover job site or to mix desired volume.
3. Position required bags on top of hydroseeder. Prepare for loading by opening bag ends.
4. Fill machine with sufficient water (2/3 of water needed for load).
5. Start mixing agitators and regulate throttle throughout loading process to achieve *MODERATE* agitation. Do not engage recirculation systems (FINN).
6. Add seed and fertilizer to tank (unless applying Bindex to pre-seeded site).
7. Load Bindex BFM through the Bowie bale breaker or load through loading hatch. With FINN forward and reverse paddles to break up any lumps. Each bag contains a water soluble packet of activator that requires no handling. Simply let the packet fall into the tank during loading.
8. Continue adding water to correct depth for number of bags and agitate at *MODERATE* throttle.
9. Vigorously agitate at full throttle ( $\approx 2 - 5$  minutes) until no lumps are visible. With FINN forward and reverse paddles.
10. Agitate slurry on *MODERATE* throttle for a minimum of ten minutes after loading to allow thickening. Perform the “Free Liquid” test to ensure suitability of slurry for application.

A quick quality control measurement to test the mixture is the Free Liquid Test. This test is completed in the field immediately prior to spraying/application. The Free Liquid Test checks for all of the following:

- Correct type and amount of binder was used during manufacturing.
- Correct Bindex BFM:water ratio was used (i.e., the proper number of Bindex BFM bags were counted and the correct amount of water was added during loading).
- Correct mixing procedure was followed so that no unmixed material is suspended in the tank.
- Correct stirring/agitation rate and duration.
- Correct longevity of components (product has not degraded during shipment or storage).

Free Liquid Test Method: Place an 8 in x 8 in (203.2 mm x 203.2 mm) square of plywood marked with concentric circles with radii of 1 in, 2 in, 3 in, and 4 in (25.4 mm, 50.8 mm, 76.2 mm, and 101.6 mm) on level ground (do not place on the machine to avoid vibration). Remove a cup [(8-10 fl.oz) (237-296 mL)] of Bindex BFM slurry from the tank. Center the plywood over the cup and turn over. Slowly lift up the cup to release the Bindex BFM slurry onto the plywood. Observe the slurry for one minute. Free liquid may be seen flowing away from the fibrous mass forming a ring around the Bindex BFM. The free liquid must travel less than 1 in (25.4 mm) in 1 minute for the mixture to pass the test.

11. Apply slurry in even layers, working back and forth, for uniform coverage of soil. Apply from two directions or from top and bottom (if possible) for best coverage results. Fit hose or cannon with proper nozzle to create a gentle and finely dispersed spray that “rains down” on soil.

Note: Bindex BFM is designed to be installed only with mechanically agitated hydroseeders.



## To Help Organize Your Approach When Applying Bindex BFM See the 4 Tips Below:

1. Remember that with Bindex BFM you are building an erosion control system on site (you are not only hydroseeding). The recommended application rate is 3,000 to 4,200 lb/acre (3,362 – 4,707 kg/ha), which is greater than some other mulch applications. Bindex BFM covers most soils with as little as 1,000 lb/acre (1,120 kg/ha), but you will need to apply the full recommended measure in order to achieve the required thickness. Anything thinner will not provide the protection necessary to ensure proper erosion control and plant germination.
2. Measure everything. Bindex BFM is dependent upon achieving the proper water-to-product ratio. 100 gallons (378.5 L) of water is required for every bag to yield 108 gallons (409 L) of Bindex BFM slurry. The job site area should be carefully measured as well. It is best to mark off the site area that will be covered by one full tank load (less any residual) to be sure that you have applied the requisite amount of the product. It is also vitally important that you conduct the Free Liquid Test on every tank load to ensure that proper mixing has occurred.
3. Watch the weather. Bindex BFM must dry completely to be effective. Do not apply to saturated soils. Do not apply if rain is expected within 24 hours.
4. Use only full bags. Each bag of Bindex BFM is self-contained and already includes all the ingredients necessary to build an efficient erosion control cover.

Within each bag you may notice one packet within the top section of the bag. This packet contains the activator that creates the bonding effect for Bindex BFM. This packet is composed of polyvinyl acetate (PVA) and will dissolve almost on contact with water.

Disclaimer: Bindex BFM is a system for erosion control and revegetation on slopes. American Excelsior Company (AEC) believes that the information contained herein to be reliable and accurate for use in erosion control and revegetation applications. However, since physical conditions vary from job site to job site and even within a given job site, AEC makes no performance guarantees and assumes no obligation or liability for the reliability or accuracy of information contained herein, for the results, safety, or suitability of using Bindex BFM, or for damages occurring in connection with the installation of any erosion control product whether or not made by AEC or its affiliates, except as separately and specifically made in writing by AEC. These guidelines are subject to change without notice.

