

Bulk Material 1:	Product
Particle Size:	-8 mesh
Moisture Content:	8.5%

**Section 2: Bulk Density / Pressure Relationship**

$\sigma_1$ , psf	45	105	315	615	1215	1815	2415
EH, ft	2.7	6	16	30	55	78	100
$\gamma$ , pcf	67.9	72.2	77.6	80.3	82.8	83.3	84.0

**Section 3: Recommended Hopper Angles for Mass Flow**

*Material and Wall Samples at 90 °F*

<u>Hopper Span, ft.</u>	<u>Carbon Steel</u>			<u>TIVAR 88*</u>			<u>2B Stainless Steel</u>		
	$\phi'$	$\theta_c$	$\theta_p$	$\phi'$	$\theta_c$	$\theta_p$	$\phi'$	$\theta_c$	$\theta_p$
0.25	28	13	24	19	25	36	25	17	28
0.5	28	13	24	19	25	36	24	18	29
1.0	28	13	24	19	25	36	22	20	31
2.0	28	13	24	19	25	36	21	21	32
4.0	28	13	24	19	25	36	21	21	32
8.0	28	13	24	19	25	36	20	22	33

$\sigma_1$  = Major consolidation pressure, psf.

$\gamma$  = Bulk density, pcf.

$\theta_c$  = Conical hopper slope required for mass flow, deg. from vertical.

$\theta_p$  = Wedge hopper slope required for mass flow, deg. from vertical.

\*TIVAR 88 is an abrasion resistant ultra high molecular weight polyethylene liner.