



TUFF-FLO FSM

VIBRATION CAST, SELF-FLOW, PUMP CAST

General Information

TUFF-FLO FSM is a fused silica and mullite-based, low cement mix that exhibits excellent strengths, refractoriness and resistance to thermal shock. This mix may be vibration cast, self flowed or pump cast. This mix is ideally suited for installation in wet bottom ash hoppers, boiler applications requiring thermal shock resistance and pier blocks for heat treating furnaces and kiln cars.

Chemical Analysis	Maximum Use Temperature	1370°C / 2500°F
SiO ₂ 61.3%	Material Required Vibration Cast	2.20 g/cm ³ (137 lbs/ft ³)
Al ₂ O ₃ 34.8%	Material Required Pump Cast	2.15 g/cm ³ (134 lbs/ft ³)
CaO 2.1%	Grain Size	5 mm (4 mesh) and finer
TiO ₂ 1.0%	Installation Methods	Vibration Cast, Self-Flow, Pump Cast
Fe ₂ O ₃ 0.5%	Standard Packaging	25kg (55 lb) multi-wall paper bags
Alkalies 0.2%	Standard Palletizing	64 bags per pallet (1600 kg / 3520 lbs)
Other 0.1%	Note:	Bulk bags available upon request

VIBRATION CAST DATA

Temperature		Density		PLC	MOR		CCS		HMOR		Porosity	K-factor		Abrasion Resistance
°C	°F	g/cm ³	lb/ft ³	%	MPa	psi	MPa	psi	MPa	psi	%	W·m ⁻¹ ·K ⁻¹	BTU·in ft ² ·hr·°F	cm ³
110	230	2.21	138	0.00	12.2	1765	79.2	11,500	n/a	n/a	8.9	1.21	8.4	
538	1000	2.19	137	-0.08	8.7	1260	54.3	7,880	n/a	n/a	14	1.18	8.2	
815	1500	2.18	136	-0.06	6.6	960	48.7	7,070	22.7	3290	14.4	1.24	8.6	7 - 13
1100	2000	2.18	136	-0.17	5.3	770	48.4	7,030	n/a	n/a	14.5	1.38	9.6	13 - 18

PUMP CAST DATA

Temperature		Density		PLC	MOR		CCS		HMOR		Porosity	K-factor		Abrasion Resistance
°C	°F	g/cm ³	lb/ft ³	%	MPa	psi	MPa	psi	MPa	psi	%	W·m ⁻¹ ·K ⁻¹	BTU·in ft ² ·hr·°F	cm ³
110	230	2.16	135	0.00	8.8	1275	50.2	7,285	n/a	n/a	12.7	1.21	8.4	
538	1000	2.15	134	-0.06	8.3	1205	47.6	6,910	n/a	n/a	15.9	1.18	8.2	
815	1500	2.13	133	-0.08	6.1	890	46.3	6,720	17.2	2500	16.4	1.24	8.6	10 - 15
1100	2000	2.13	133	-0.15	5.4	780	45.5	6,600	n/a	n/a	16.5	1.38	9.6	15 - 20

SET TIMES AND WATER REQUIREMENTS

	External Vibration	Internal Vibration	Pump/Shotcrete	Self-Flow
Water Required %	5.0 - 5.8	5.4 - 5.8	6.6 - 7.4	7.2 - 7.8
Working Time	1 - 2 hr	1 - 2 hr	4 - 8 hr	4 - 10 hr
Initial Set	1 - 4 hr	1 - 4 hr	4 - 8 hr	6 - 10 hr
Final Set	3 - 8 hr	3 - 8 hr	6 - 12 hr	8 - 12 hr

Special Testing: n/a

Allied Mineral Products, Inc. supplies a complete line of monolithic refractories for industrial applications. For more information or a complete evaluation of your refractory requirements, please contact your local Allied representative.

Warning: Contains aluminum oxide, aluminosilicate, cement, and silica. The International Agency for Research on Cancer (IARC) has classified crystalline silica inhaled in the form of quartz or cristobalite carcinogenic to humans. Refer to Material Safety Data Sheet for additional information and disposal instructions. Avoid breathing dust. Wear NIOSH approved respirator during installation, removal, and disposal of product to prevent inhalation of dust. Avoid contact with skin and eyes. Cement powder or freshly mixed castable may cause eye and skin irritation. Steam spalling, which can lead to personal injury, may result from improper drying and firing procedures. In case of eye contact, flush immediately and repeatedly with water and consult a physician. For safest use and optimum performance, proper practices must be followed.

TUFFFSM
1/13/12
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