



TUFF-FLO 50

VIBRATION CAST, PUMP-CAST

General Information

TUFF-FLO 50 is a coarse low cement castable designed for vibration cast or pump casting installation. This product is suited for use in mineral calcining, reheat and anneal furnaces, wood burning boilers, firebox walls and roofs, combustion chambers, ash drops, biomass boilers, kiln car tops, back-up linings for ladles, chain sections of rotary kilns, bottom ash hoppers for coal fired boilers, FCCU transfer lines, cyclones, air heaters, and as a general purpose castable.

Chemical Analysis

		Maximum Use Temperature	1650°C (3000°F)
Al ₂ O ₃	50.2%	Material Required Vibration Cast	2.32 g/cm ³ (145 lb/ft ³)
SiO ₂	44.4%	Material Required For Pump-casting	2.27 g/cm ³ (142 lb/ft ³)
CaO	1.3%	Grain Size	10 mm (3/8 inch) and finer
TiO ₂	2.0%	Installation Methods	Vibration Cast, Pump-cast
Fe ₂ O ₃	0.8%		
Alkalies	0.8%		

VIBRATION CAST DATA

Temperature		Density		PLC*	CMOR		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 ⁻¹ ·F	cm ³
110	230	2.34	146	-	13.1	1900	84.7	12300	-	-	9	-	-	-
815	1500	2.32	145	-0.2	12.1	1750	81.3	11800	23.3	3375	14	-	-	6 - 8
1100	2000	2.31	144	-0.4	13.4	1950	93.7	13600	-	-	13	-	-	-
1400	2550	2.26	141	0.5	15.8	2300	95.1	13800	-	-	14	-	-	-
1500	2732	2.19	137	0.8	15.5	2250	99.9	14500	-	-	9	-	-	-
1600	2910	0.03	2	2.1	12.4	1800	82.7	12000	-	-	11	-	-	-

*Permanent linear change after firing

**Estimated

PUMP-CAST DATA

Temperature		Density		PLC*	CMOR		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 ⁻¹ ·F	cm ³
110	230	2.31	144	-	11.0	1600	65.5	9500	-	-	11	-	-	-
815	1500	2.27	142	-0.1	10.0	1450	55.1	8000	18.9	2750	17	-	-	7 - 10
1100	2000	2.27	142	-0.4	11.4	1650	62.0	9000	-	-	18	-	-	-
1400	2550	2.24	140	0.3	13.1	1900	62.0	9000	-	-	18	-	-	-
1500	2732	2.21	138	0.4	15.5	2250	82.7	12000	-	-	13	-	-	-
1600	2910	2.05	128	1.7	14.5	2100	69.6	10100	-	-	14	-	-	-

*Permanent linear change after firing

**Estimated

SET TIMES AND WATER REQUIREMENTS

	Vibration	Pump
Water Required	5.0 - 6.0 %	5.8 - 6.6 %
Working Time	up to 1 hr	2 - 4 hr
Initial Set	2 - 6 hr	4 - 12 hr
Final Set	3 - 12 hr	6 - 18 hr

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, aluminosilicates, 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.

TUFF50
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