

**Plico Gun Mix Tuff Mix**

Product Number 14033

Date 2/10/2014

**Product Description**

An intermediate duty, high strength, refractory gun mix.

**Service limit -** 2500°F 1,371 °C

**Std. package** 55 # / 25 kg Bag

**Density to place** 120 pcf 1,922 kg/m<sup>3</sup>

**Water range per std. package:**

**Density in service** 120 pcf 1,922 kg/m<sup>3</sup>

**Casting** to qts 0.0 to 0.0 l

**Min time before firing** 24 hr

**Pumping** to qts 0.0 to 0.0 l

**Chemistry % (calcined)**

Al <sub>2</sub> O <sub>3</sub>	45.7	P <sub>2</sub> O <sub>5</sub>	
SiO <sub>2</sub>	42.1	Alk.	0.6
Fe <sub>2</sub> O <sub>3</sub>	1.7	MgO	0.2
CaO	7.5	SiC	
TiO <sub>2</sub>	2.1	ZrO <sub>2</sub>	
		Other	

**Thermal Conductivity**

	btu*in/hr*ff <sup>2</sup> *°F	w/m°C
500F / 260C	5.7	0.82
1000F / 540C	5.8	0.83
1500F / 815C	6.0	0.86
2000F / 1090C	6.5	0.93

**Abrasion Loss**

per ASTM C 704  
after 1500 F

cc

**Coefficient of Thermal Expansion**  
(reversible)

2.9 x 10<sup>-6</sup> in/in F

5.2 x 10<sup>-6</sup> m/m C

Temperature per <u>ASTM C113 / C865</u>	Linear Change per <u>ASTM C113 / C179</u>	Cold MOR		CCS		Hot MOR	
		per ASTM C133 <u>psi</u>	<u>MPa</u>	per ASTM C133 <u>psi</u>	<u>MPa</u>	per ASTM C583 <u>psi</u>	<u>MPa</u>
230 F / 110 C	-0.2%	900	6.2	3500	24		
1500 F / 815 C	-0.3%	600	4.1	2800	19	600	4.1
2000 F / 1090C	-0.4%	500	3.4		0	450	3.1
2500 F / 1370 C	1.2%	1200	8.3		0	150	1.0
			0.0		0		0.0

**Other Data**

**Heat Up Guide**

Schedule B

**ASTM Class**

C 401 Class C

Regular Castable

**Note:**

All data are averaged results of ASTM tests (where applicable) on laboratory gunned specimens. Reasonable variations in data can be expected. Data is not to be used for specification purposes. Product data is periodically updated to reflect product / raw material / process / testing changes. Please consult your Plico representative to make sure you have the most current data.

*Plico Refractories are manufactured by Plibrico Company LLC, USA.*