PLAINTIFF'S EXHIBIT

PLI-133

PLIBRICO COMPANY · Refractory Engineers ·

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Gentlemen:

We have recognized the need for a brief listing of Plibrico recommendations, in the non-metallic industry's equipment, for a long time. However, there are so many variations that any list could be misused with serious results.

With this in mind, we submit herewith a list that shows a starting point recommendation. From this starting-point, you must adjust your specifications to suit the requirements. For example, the hot end walls of a Fuller Clinker Cooler may be extremely hot and require Plicast K-L Mix instead of Tuff-Mix.

Plicast #15 is specified for the "cold end, walls" of the Clinker Coolers. Frequently, Plicast #27 will be indicated, due to a time schedule or for its faster setting. Also, a higher temperature material is sometime required.

Remember, all of the following are starting-point or "standard." They have been based on years of successful experience.

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CEMENT PLANTS

EQUIPMENT	REFRACTORY LOCATION	REFRACTORY RECOMMENDATION	STD. DRAWING
FIRING HOOD	All	8" Plibrico Standard or Super Air Bond	C-6
		2" Plisulate 201 Block Insul.	C-6
CLINKER COOLER (Fuller)	Hot end, walls	8" Plicast Tuff-Mix	C-3
		2" Plisulate 201 Block Insul.	C-3
	Middle, walls	7" Plicast Tuff Mix	C-3
		2" Plisulate 201 Block Insul.	C-3

CEMENT PLANTS (Cont'd.)

EQUIPMENT	REFRACTORY LOCATION	REFRACTORY RECOMMENDATION	STD. DRWG.
	Cold end, walls (No impact plates)	9" Plicast #15 (or #27)	C-3
	Behind impact plates (walls)	13½" Plicast LWI-20 (or #15)	C-3
	Arch	7" Plicast Tuff-Mix	C-3
		1" Insulation	C-3
NOTE: Walls may taper from 12" thick at base channel to 9" (7" + 2") at hot end at the top, and from 12" to 6" (5" + 1") at middle walls to make forming easier and for better appearance. See drawing C-3 for details			
CLINKER COOLER (Allis-Chalmers)	Hot end, walls	7" Plibrico Standard Air Bond	C-11
		2" Plisulate 201 Block Insul.	C-11
	Middle, walls	7" Plicast Tuff-Mix	C-11
		2" Plisulate 201 Block Insul.	C-11
	Cold end, walls	5" Plicast #15 (or #27)	C-11
		2" Plisulate 201 Block Insul.	C-11
	Arch, hot end	7" Plicast Tuff-Mix	C-11
		1" Insulation	C-11
	Arch, cold end	6" Plicast LWI-20	C-11
		1" Insulation	C-11
CLINKER COOLER(Rotary)	Data will be furnished upon receipt of detailed information.		
CLINKER COOLER (Hopper type)	Sidewalls	9" Plicast K-L Mix	C-
		2" Plicast Verilite	C-
	Arch	7" Plicast Tuff-Mix	C-
		2" Insulation	C-
KILN TAIL RINGS	Under 1000°F	Plicast #15-R	C-4
	Over 1000°F	Plicast Tuff Mix or KL Mix	C-4
DUST CHAMBERS (Air Cooled)	Sidewalls	7" Plicast #27 (#15 under 1500°)	C-7
	Arch	7" Plicast Tuff-Lite	C-7
DUST CHAMBERS (Solid)	Sidewalls	6" Plicast #27 (#15 under 1500°)	C-7A
		2" Plisulate 201 Block Insul.	C-7A
	Arch	7" Plicast Tuff-Lite	C-7A
BREECHINGS (Under 1000°)	Sidewalls	5" Plicast Tuff-Lite or #15	C-8
	Arch	7" Plicast Tuff-Lite or #15	C-8
	Floor	5" Plicast Tuff-Lite or #15	C-8
BREECHINGS (Over 1000°) (Air Cooled)	Sidewalls	7" Plicast #27 (#15 under 1500°)	C-8
	Arch	7" Plicast Tuff-Lite	C-8
	Floor	4" Plicast #27 (#15 under 1500°)	C-8
		3" Plicast Verilite	C-8

CEMENT PLANTS (Cont'd.)

EQUIPMENT	REFRACTORY LOCATION	REFRACTORY RECOMMENDATIONS	STD. DRWG.
WASTE HEAT BOILERS	Sidewalls (First pass)	9" Plicast Tuff-Mix, tapers to 4½"	
		2" Plisulate 201 Block Insul.	
	Sidewalls (After first)	4½" Plicast #15 (or #27)	
		1" Plisulate 201 Block Insul.	
	Hoppers	9" Plicast Tuff-Mix(#15 after first)	
	Drums	3" Plicast Verilite with hard finish	
	Baffles	4" Plicast Baffle-Mix	
STACKS (Under 1000°) (Solid)	Bottom 50'	9" Plicast #15 (or #27)	C-9
		2" Plisulate 201 Block Insul.	C-9
	Upper	5" Plicast Verilite	C-9
STACKS (Over 1000°) (Air Cooled)	Bottom 50'	9" Plicast #27 (#15 under 1500°)	C-9
	Upper	6" Plicast #27 (#15 under 1500°)	C-9
STACKS (Over 1000°) (Solid)	Bottom 50'	6" Plicast #27 (#15 under 1500°)	C-9
		2" Plisulate 201 Block Insul.	C-9
	Upper	5" Plicast #27 (#15 under 1500°)	C-9
		1" Plisulate 201 Block Insul.	C-9

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DRYER COMBUSTION CHAMBERS

REFRACTORY TEMPERATURE	SHELL DIAMETER	REFRACTORY RECOMMENDATION	STD. DRWG.
"Normal"	Over 9'	9" Plibrico Super Air Bond	D
	9' to 8'	8" Plibrico Super Air Bond	D
	8' to 7'	7" Plibrico Super Air Bond	D
	7' to 5'	6" Plibrico Super Air Bond	D
	5' to 4'	5" Plibrico Super Air Bond	D
	4' to 3'	4½" Plibrico Super Air Bond	D
	Under 3'	3" Plibrico Super Air Bond	D

ASPHALT PLANTS - See Note 5

NOTE 1: In event of known high operating temperatures, poor draft, or insufficient tempering air, use Plibrico 60 Air Bond.

NOTE 2: In event of known low operating temperatures, good draft, or sufficient tempering air, use Super Air Bond for the front wall (including burner cone) and Standard Air Bond for remainder.

NOTE 3: Air Bond is normally recommended to take advantage of air setting overnight, and as job progresses. This provides a firmer base for the next day's work.

Further, Air Bond will reduce shrinkage and permit a delay in required firing, beyond 48 hours, for installation of burner equipment, etc.

Further, Air Bond is required for low temperature installations as it provides necessary mechanical strength.

NOTE 4: The smaller shell diameters, listed above, are frequently used for throat and transition sections. Also, for some firing extensions.

NOTE 5: Asphalt plants sand dryer tuyeres (Combustion Chamber) are usually tapered with a 6" refractory lining of Plibrico 60. In some instances where real extreme combustion conditions are encountered - Plibrico 70 or 80 should be installed.

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GYPSUM CALCINING KETTLES (SUSPENDED ONLY)

Area	REFRACTORY LOCATION	REFRACTORY RECOMMENDATIONS	STD. DRAWING
COMBUSTION CHAMBER	Sidewalls	9" Plibrico Super Air Bond	G-1
		5" Plisulate 201 Block Insul.	G-1
	Floor	6½" Plibrico Super Air Bond	G-1
		6" Plicast LWI-24	G-1
		5½" Plicast Verilite	G-1
UPPER ZONE (Around Kettle)	Sidewalls	6" Plibrico Standard Air Bond	G-1
		3" Plisulate 201 Block Insul.	G-1
ROOF	With cast iron T's	6" Plicast #27	G-1
		2" Plicast Airlite	G-1

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TO REPEAT: The preceding are basic or normal recommendations. There are many exceptions and variations, with the result every job must be evaluated on its own merits as to service and price.

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We have not covered such equipment as phosphorous furnaces, lime kilns (Shaft or rotary hearth type), sulphur burners, pre-heaters, glass furnaces, brick kilns, and other extremely specialized applications. We have very successful installations on the above types of furnaces. Either plastic or castable can be installed in all or a part of any of these furnaces. Data will be furnished upon receipt of detailed information.

Sincerely,

PLIBRICO COMPANY

R. D. Verkheiser, Manager
Non-Metallics Division

RDV:ms

Distribution: Groups A, B, C, D
Tab 2