

REFRACTORIES and INSULATIONS



CE/HI (F) 33097

REFRACTORY & INSULATION CORPORATION
720 WALL STREET NEW YORK 5, N.Y.

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EXHIBIT

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Foreword

Founded a quarter century ago, the Refractory and Insulation Corporation has been constantly developing refractory and insulating materials of superior quality, utility and efficiency to meet the changing requirements of the many industries it serves.

IN THE REFRACTORY FIELD, this Company originated and manufactured the first castable refractory cements, expanding their volume from a small quantity to the large tonnage now being used in modern furnaces, steam generators and coke oven plants, always meeting the new operating conditions set up by changing designs in equipment.

Other refractory products, such as Super Bonding Cements and Chrome Base Cements have been developed through field contact of R & I sales engineers with heat generating problems and backed by careful laboratory research to meet the conditions presented by industry.

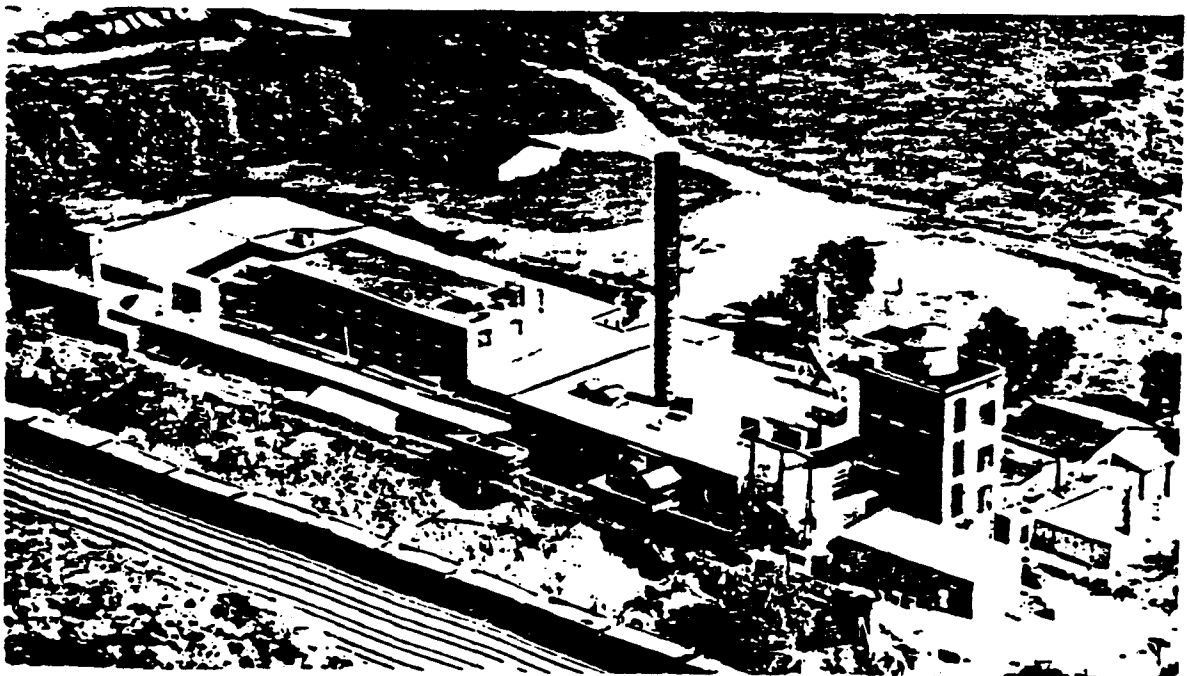
IN THE INSULATION FIELD, the same cooperative, on-the-spot engineering investigation, laboratory studies and practical production methods have resulted in such products as Monolithic Insulations, Water-Resistant High Temperature Block and Intermediate Type Insulating Block, which eliminate the need for double layer construction. Castable, pouring, filling and plastering type insulations are also manufactured to meet growing and ever changing requirements.

New and improved types of R & I Refractories and Insulations have aided materially in the development of the modern steam generating units, from small boilers to large power steam units in the million pound unit class now used in the larger plants.

Our large plant at Port Kennedy, Pa., with its modern production, handling and storing equipment makes R & I an important, assured and ready source of supply for refractory and insulation products of uniform high quality.

It is the purpose of this catalog to help you select materials that will best serve your requirements.

Where unusual conditions prevail, R & I technical facilities and engineering information are available to help solve your refractory and insulation problems.



Aerial view of Refractory & Insulation Corp. plant at Port Kennedy, Pa.



Manufactures

REFRACTORY MATERIALS

	Catalog No.		Catalog No.
Castable Cements		Bonding Cements — Air Setting	
Moldit-A	R-52	#3000 Cement	R-53
Moldit-D	R-52	Super #3000	R-53
Moldit Pier	R-52	Reeco	R-53
Super Moldit	R-52	Jamb Patch	R-53
Moldit-B	R-52	Furnace Cement	R-56
Light Weight Moldit #80	R-52		
Light Weight Moldit #55	R-52		
Moldit-N	R-56	Bonding Cements — Heat Setting	
Molding Mix	R-56	#2700 Cement	R-55
Baffle Mix	R-56	Fire Check	R-55
Oven Door Facing	R-56	#3250	R-55
Hy-Temp Flexible Cement	R-56	#3450	R-55
Chrome Base Castable Cements		Ramming Type Refractories	
Moldit Chrome	R-54	Plastic Fire Brick	R-57
Low Temperature Chrome	R-56	Super Plastic Fire Brick	R-57
Chrome Patching Cement	R-56		
Gun Cement	R-56		
Mix #100	R-56		

INSULATING MATERIALS

Blocks and Blankets		Loose Fill Dry Filler		I-90
#14 and 18 Insulating Block	I-86	Pakinsul Mineral Wool Mixture		I-90
Mineral Fibre Insulating Blankets	I-87	Loose Wool		I-90
Inside Duct Lining	I-91	Mix A, B and C Dry Filler		I-90
"Krack-Pruf" Combination Insulation	I-92	Expansion Joint Caulking Material		R-56
Plastic Heat Insulations		Electrical Insulations		
Stic-Tite Insulating Cement	I-88	Condu-Seal Cable Packing	I-93	
Super Finish Stic-Tite Insulating Cement	I-89	Arc-Resisting Cement	I-93	
Guninsul Cement	I-90	Coil Cement	I-93	
#1800 Cement	I-90	Surface Protective Coatings		
Block-Stick	I-86	Weatherkote Asphaltic Finish	I-89	
Fill Insulations		Mastic Coating for Refractories & Insulations	R-56	
Pourinsul Cement	I-90	Aluminum Paint	I-92	

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Catalogs are filed in numerical order according to the number to be found in the lower right-hand corner on the first page of each catalog.

CE0114034



CASTABLE REFRACTORY MATERIALS

MOLDIT REFRACTORY CEMENTS

*for Monolithic Linings, Facings and Refractory
Shapes of Any Size*

A complete line of dry, fine granular, hydraulic setting materials of outstanding quality for molding monolithic refractory construction and casting shapes of all types such as burner blocks, furnace tile, etc.



Moldit Refractory Cements, when mixed with water to proper consistency, can be poured like ordinary concrete into any monolithic shape, or shoveled, tamped, or shot into place with a cement gun. No pounding or ramming is necessary. Because of their uniform fine grain size, Moldits are ideal for precasting into special shapes of tile, blocks or other simple or complicated sections. They are suitable for smooth surface troweling, and for numerous delicate patching jobs.

Moldit refractory shapes, cast into place, actually cost considerably less than fire brick construction. Moldit construction can be prepared and applied at the point

of installation. No expensive fire clay shapes are necessary, nor is there need to wait for their special manufacture and delivery. No inventory need be carried of those special shapes which may be used only irregularly. It takes less time and labor to install Moldit. Any replacement or repair can be made and equipment put back into service in less than 24 hours.

STRONG — HARD — IMPERVIOUS HEAT-RESISTANT

R & I Moldit Cements are uniformly prepared dry, granular mixtures of aluminum silicate base materials which when mixed with water and cast, "air set" to burned refractory hardness. They set sufficiently hard in about 4 to 12 hours at ordinary temperatures. "Baking out" to prevent shrinkage or disintegration is unnecessary. Since Moldit Refractory Cement "air set," they have high strength at low temperatures. Furthermore, they do not spall due to temperature changes or rapid cooling. Moldit surfaces are entirely water-resistant, and may be readily sprayed or washed for long periods without disintegration.

Furnace linings built from Moldit refractory shapes have about twice the insulating value of fire brick or fire clay linings. They are also lighter and have lower coefficients of expansion. Hence they can be used in somewhat thinner sections, thereby effecting worthwhile economies.



Special shapes of all sizes can be made quickly and easily.

REFRACTORY & INSULATION CORPORATION

MANUFACTURERS OF REFRACTORY BONDING AND CASTABLE CEMENTS, INSULATING BLANKETS, BLOCK AND CEMENTS

120 WALL STREET

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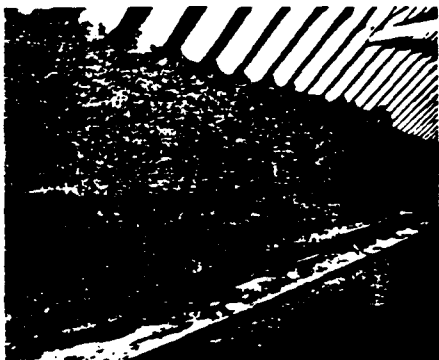
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Large, flat, monolithic baffles made of Moldit-A, installed in a 400,000 lb./hr. steam boiler. These baffles have been in service for a long time without repairs.



Cement gun applicator shooting R & I Moldit-D in place in ash hopper of large public utility boiler.



Surface of R & I Moldit-D after shooting in place with cement gun in ash hopper above.



Moldit-A used to line these coke oven standpipes—still in good service after 18 years.

PROPERTIES OF MOLDIT

The user is not limited to one type of Moldit Refractory Cement. There are seven different Moldits, each possessing special advantages as to physical characteristics, workability, density and durability with respect to particular applications. The following table shows the wide range of properties offered by the Moldit family:

Product	Fusion Point	Working Qualities	Storage of Dry Material	Installed Weight
Moldit-A	2552°F.	Smooth, trowels well, pours well. O.K. to use with cement gun.	6 months Maximum	108# : cu. ft.
Moldit-D	2552°F.	Very smooth, trowels very easily. Pours well. O.K. to use with cement gun.	8 months maximum	115
Moldit Pier	2450°F.	Same as Moldit-A.	6 months maximum	108
Super Moldit	3002°F.	Very smooth, fine, needs agitation when poured. O.K. to use with cement gun.	4 months maximum	108
Moldit-B	2552°F.	Trowels and pours well.	6 months maximum	110
Light-Weight Moldit #80	2462°F.	Trowels well; with 33% water will go through 1.8 lath and stick to itself. O.K. to use with cement gun.	4 months maximum	80
Light Weight Moldit #55	2345°F.	Same as Light Weight Moldit #80.	4 months maximum	55

Product	Crushing Strength on Cylinders (p.s.i.)	Modulus of Rupture When Fired and Cooled at °F. (p.s.i.)				
		Cured	1000	1500	2000	2400
Moldit-A	2844	850	450	425	550	2280
Moldit-D	3200	1050	734	542	620	2580
Super Moldit	600	310	310	387	554	2518
Light Weight Moldit #80	760	310	222	361	336	—

SIMPLE CASTING PROCEDURE

Complete instructions for mixing are printed on colored tags attached to each bag of Moldit Cement. Water must be added slowly while continuously mixing with a shovel or hoe. Moldit which has been mixed with water and allowed to partially set should never be used.

Since the actual hardening of Moldit depends on chemical combination of water with the dry constituents, proper conditions of moisture must be maintained. Therefore, care must be taken to prevent rapid evaporation of water while the mixture is setting in the mold. In the case of a dry atmosphere or where an individual casting or patched area has a large surface area exposed to the atmosphere, sufficient moisture for hardening may be assured by one or more of the following methods:

- By placing the mold in a room or chamber with a humid atmosphere.
- By covering the mold with waxed paper or other suitable covering.
- By spraying water on the exposed surface just enough to counteract the deficiency caused by evaporation.

Temperature is an important factor in determining the time required for hardening of Moldit to maximum strength. At ordinary room temperature (60-75°F.), curing or hardening proceeds satisfactorily. At lower temperatures the time of hardening is greatly increased. The thinner the cast section, the longer is the time required for strength sufficient for handling. While thick, massive sections harden sufficiently in 4-5 hours, thin, upright sections require 24 hours before it is safe to remove them from the mold. Generally overnight is a convenient period for hardening Moldit in wet pour molds.

A TYPE FOR EVERY NEED

MOLDIT-A

Moldit-A Refractory Cement is a specially prepared, dry granular material of uniform consistency. It has a fusion point of 2552°F. (Orton Cone Test) and may safely be used at temperatures up to 2400°F. It has practically no firing shrinkage.

Moldit-A weighs only 108 lbs. per cu. ft. molded into shape and dried. There may be a slight variation in weight (never more than 5 per cent) from the average, due to molding pressure, shape of molded piece or quantity of water used.

For best results in pouring or casting, the dry refractory material should be mixed with from 22-23 per cent of its weight of water, or 11 qts. of water per 100 lbs. of Moldit-A, which is just enough so that the mix will just flow. Using excessive water may increase fluidity but will produce weaker molded shapes. For tamping, 9 qts. of water should be used, but tamped refractories should be "cured" by water spray at regular intervals. Where metal rod reinforcements are required, they should be painted with tar or thick paint to allow for the metal's expansion and contraction.

Moldit-A is packed in 100-lb. quantities in heavy, water-resistant bags. Directions for use are given on a BLUE TAG attached to each bag.

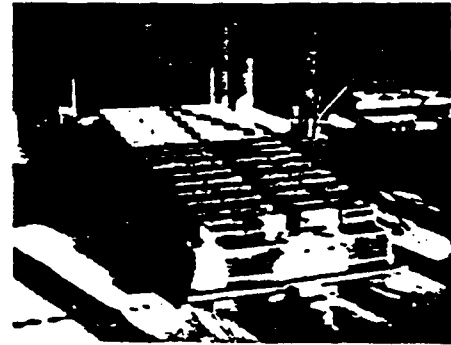
MOLDIT-D

Moldit-D Refractory Cement is the strongest of the Moldits, with a cold crushing strength of 3200 lbs. per sq. in., which is far in excess of the thermal and mechanical load put on any refractory. Its strength averages 15 to 20% higher than that of any other castables. It has a fusion point of 2552°F. (Orton Cone Test), and may be safely used at any temperature up to 2400°F. If used with water-cooled sections, it can be exposed to higher temperatures. Up to 2200°F., Moldit-D has no shrinkage, and above that its shrinkage is less than 1 per cent. Therefore, because of its high strength and its resistance to heat, abrasion, acids, water and gases, it is especially useful in the walls, baffles and arches of high temperature furnaces and boilers of all types, in coke oven doors where it can take considerable shock and abrasion, and especially in ash pits under stoker-fired boilers which are constantly bombarded with falling clinkers and ashes, intermittent spray of water or salt water to flush out the ashes. Cold water sprayed on red hot Moldit-D refractory surfaces does not harm it.

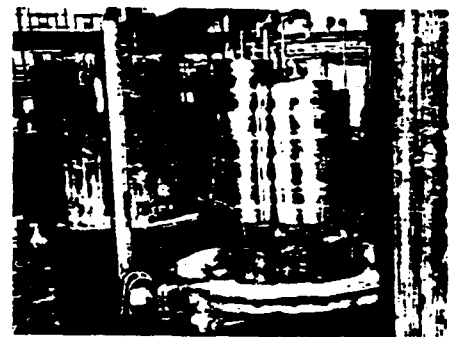
Extensive successful experience with Moldit-D shows reductions in labor cost of as much as 90 per cent because of the ease of its installation and reduction in boiler outage for repairs.

Like Moldit-A, described above, Moldit-D can be poured, troweled, shoveled into place and trowel-finished smooth and abrasion-resistant in large, monolithic sections and in special shapes such as burner blocks, boiler tile, baffles or other shapes. It is particularly suitable for use with a cement gun because, when shot into place at high pressure, it forms a very dense, monolithic mass which gives extra service and wear. For example, by way of contrast, it takes 661 man-hours to pound and hammer 18 tons of plastic refractory in place. The same quantity of Moldit-D can be shot in place in 35 man-hours.

Moldit-D weighs approximately 115 lbs. per cu. ft. molded into place and dried. It is packed in 100-lb. quantities in heavy water-resistant bags. General instructions for mixing, pouring and "curing" are much the same as those for Moldit-A and are given on a GRAY TAG attached to each bag.



Car bottom and pier of large steel annealing furnace, cast from R & I Moldit Pier Cement. More than 200,000 lbs. of this Moldit Cement were used.



Base of bell type annealing furnace made of Moldit-D has a smooth, hard, flat surface that does not bulge or crack due to intermittent firing.



Coke oven door lined with blocks made of R & I Moldit Pier Cement. Moldit block doors of this type last three to four years—and even longer.

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Moldit Pier

Moldit Pier Cement has unusual strength for building refractory piers, bases, hearths, car bottoms and other structures in furnaces and boilers which must withstand abrasion mechanical and thermal shock and be resistant to moisture or acid. It can be used at all temperatures to 2300°F.

Moldit Pier is mixed and cast or applied in the same way as Moldit-A. For pouring it should be mixed with about 22% of its weight of water or with about 11 qts. of water per 100 lbs. of dry cement. It weighs 108 lbs. per cu. ft. in place. Directions are given on GREEN TAG attached to each bag.

Super Moldit

Super Moldit Cement is used for installations to be exposed to temperatures up to 2900°F. Its fusion point (Orton Cone Test) is 3002°F. Its cold crushing strength is considerably below that of Moldit-A or Moldit-D, however, when fired at temperatures of 2400°F. and higher, it becomes very strong. It is particularly suitable for such refractories as burner cones.

Super Moldit is handled in much the same manner as is Moldit-A. In pouring, it requires agitation to assure a homogeneous casting. It can be troweled to a very fine, smooth finish. Super Moldit weighs approximately 108 lbs. per cu. ft. molded in place, cured and dry. It is packed in 100-lb. bags. A PINK TAG, attached to each bag, gives directions for mixing.

Moldit-B

Moldit-B Cement is made especially for use as a plaster for large patching jobs. It has the same non-shrinking, mechanical and thermal characteristics as Moldit-A and is slightly adhesive. Water has no harmful effect on Moldit-B surfaces.

Mixed with 11½ qts. of water per 100 lbs. to a thick, pasty mass, it becomes particularly suitable for tamping into large holes or areas broken away or eroded in service as in patching back of water walls and tubes of boilers. It weighs 110 lbs. per cu. ft. of construction. Directions for mixing are on ORANGE TAG attached to each bag.

Light Weight Moldit #80

This cement combines refractory and insulating qualities to produce a castable refractory concrete or low thermal conductivity and relatively light weight, with consequent savings in supporting steel work and lower fuel costs. Its heat conductivity and storage capacity are but a small fraction of those of fire brick. Because of its good mechanical strength and resistance to spalling, it is a very satisfactory material for casting special shapes, door linings and furnace sections which will be used at temperatures up to 2200°F. Its fusion point is 2462°F. (Orton Cone Test). It is prepared in the same way as Moldit-A.

Light Weight Moldit #80 weighs 80 lbs. per cu. ft. installed. It is packed in 100-lb. bags. Directions for mixing are shown on a BROWN TAG, attached to each bag.

Light Weight Moldit #55

This cement has somewhat lower refractory but better insulating properties than Light Weight Moldit #80. Otherwise, its thermal properties are much the same as those of Light Weight Moldit #80.

Light Weight Moldit #55 weighs about 55 lbs. per cu. ft. installed. It is packed in 60-lb. bags. Directions for mixing are shown on a WHITE TAG, attached to each bag.

GENERAL APPLICATIONS

Specific Recommendations Made on Request.

Boiler Furnaces

Making one-piece linings in inspection doors, clean-out doors, explosion doors.

Boiler door arches and rear arches—stronger than plastic rammed refractory—cheaper and easier to install than special shapes.

Flat horizontal baffles over tubes of water tube boilers; oblique or vertical baffles; eliminates gas leakage through joints in tile construction.

Walls above the tube line (used instead of fire brick); can be anchored to the common brick wall. Patching large wall, arch or other refractory sections. Ash pit walls; ash hoppers; gate tile for chain grate stokers; supports for stokers; burner blocks; header tile and special refractory parts which can be cast on the premises instead of ordering precast special shapes.

Air Preheaters

Monolithic refractory floors.

Stacks and Breechings

Monolithic lining of stacks, relief stacks and off-takes of any shape.

Incinerators

Walls and arches—where strength and resistance to abrasion and moisture are important.

By-Product Coke Ovens

Lining doors in monolithic, sectional or block form; also repairing worn door refractory. Lining standpipes.

Industrial Furnaces, Kilns, Retorts

Arches, wall sections and door linings of annealing and heat treating furnaces and kilns; car bottoms of heat treating furnaces; linings for pot-type melting furnaces and pit fire covers; other large and small special shapes.

Oil Burners—Gas Burners—Stokers

Precast linings and shapes of any kind; combustion chambers; rotary hearths, stoker hearths; gas burner blocks, etc.

Special Refractory Shapes and Blocks

for Water Gas Generator doors; cracking coils in oil cracking furnaces, door linings for steel mill furnaces; damper doors of lime and cement kilns, etc.

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CE/HI (F) 33103



REFRACTORY BONDING CEMENTS

Make New Refractory Brickwork Permanent Reduce Frequency and Cost of Repairs

R & I "Air Setting" Bonding and Patching Cements are scientifically prepared refractory materials for:

1—Bonding fire clay brick, refractory tile or monolithic sections with air-tight, strong, thin (or thick) joints without fear of shrinkage or separation from the bonded brick or sections because of thermal movement.

2—Adding protection to refractory surfaces by wash-coating to provide smooth surfaces which better resist the destructive action of flame, gases, slagging and clinkering.

3—Hot or cold patching broken down or eroded refractory sections, without shutdown.

These cements are ready-prepared, pure, plastic mixtures of uniform granular texture. They air set to full strength. Their shrinkage before firing is very small. Their resistance to heat penetration and spalling due to sudden temperature changes is very high.

R & I Bonding Cements are matchless for adhesiveness. They produce joints that are stronger than the brick itself. There is no cracking or breaking of the bond to cause heat losses through refractory wall and destruction of backing insulation, or to allow heat to get in between joints, one of the causes of spalling.

Thus, because of their ability to withstand severe firing conditions and flame erosion, the use of R & I Bonding Cements assures increased life of refractories and reduced "outage" and maintenance cost.

Several types of R & I Refractory Cement are available to best meet specific physical and thermal conditions.



The jambs of a coke oven down for repairs, being patched with Super #3000 Cement. The new brickwork is also being bonded in place with Super #3000 Cement.

PHYSICAL DATA

R & I Product	Base	Highest Working Temp. *F. No Water Cooling	Softening Point *F.	Fusion or Melting Point *F.	Dipped-lbs. per 1000 Fire Brick	Washcoat Lbs. per 100 sq. ft.	Maximum Storage Months
#3000-B	Aluminum Silicate	2650	2600	Cone 18 2714	390	15	3
#3000-C	Aluminum Silicate	2850	2800	Cone 23 2876	390	12	6
Super #3000	High Alumina	3000	3000	Cone 31 3056	300	12	4
Reeco	Silica	2750	2750	Cone 20 2786	390	15	4
Jamb Patch	Aluminum Silicate	2700*	—	2800*	—	—	—

*When mixed with silica flour.

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Catalog No. R-53

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SERVICE DATA

R & I Product	Consistency As Shipped	% by Wt. of Water to Add for Trowelling	Stickiness	Working Qualities	Wt. Lbs./Cu. Ft.	Net Wt. Lbs. per Container
#3000-B	Medium Thick	0	Very Sticky	Good—Cement creamy	130	80 and 200
#3000-C	Fairly Thick	3	Fairly Sticky	Good—Cement thick paste	135	80 and 200
Super #3000	Very Thick	5	Sticky when mixed with water	Heavy consistency for patching. Good when mixed with water	136	200
Reeco	Fairly Thick	5	Sticky	Good—Cement thick paste	140	200
Janib Patch	Heavy Paste	—	Very Sticky	Good	126	200

R & I SUPER #3000 REFRACTORY CEMENT

For Severe Service at High Temperature

The most remarkable Refractory Cement developed to date, R & I Super #3000 Refractory Cement, meets severe conditions at both high and low temperatures. Where other refractories fail, this Cement is giving extraordinary results in cases of abrasion and other severe refractory service conditions.

This ready-mixed, plastic, dense, air-setting mortar sets extremely hard and bonds very strong. With a fusion point above 3000 deg. F. and its remarkable resistance to wear at both high and low temperatures, it has found wide acceptance for applications where service is severe.

R & I Super #3000 Refractory Cement is excellent for setting new fire brick and fire tile and for hot or cold patching of worn fire clay, silica or other super brick in walls, floors and arches of furnaces, in soaking pits, ladles, etc.

When laying refractory brick or tile, joints can be made as thick as desired because R & I Super #3000 sets hard with little or no shrinkage, holding the brick weld-tight. It can also be thinned to a creamy mix to make the thinnest possible joints. A still thinner mix permits its use as a wash coating which preserves and extends the life of refractory surfaces.

Super #3000 is used extensively in coke ovens for both hot and cold patching of cracks and spalls in liner bricks, leaks in roofs, and for laying up or rebuilding the ends of the regenerator division and front face walls.

The floors in coke ovens are a continuous source of trouble in practically all coke plants and Super #3000 has proved successful for patching or pouring a new surface on the floors of troublesome ovens. It can also be used around charging holes, gas gun blocks, regenerator faces and lasts two to three times as long as other refractory cement in jamb patches.

It has also proved a valuable protective refractory covering over the insulation of inside duct lining to provide the best possible resistance to high temperature, abrasion and erosion of gases. Troweled as a thick paste to the required thickness over expanded metal lath and insulation, it dries to a flint-like hardness.

Because of its abrasion-resistant qualities, Super #3000 has given excellent service when applied over expanded metal wire, which has been welded to the worn plates of induced draft fan housings where the abrasion is most severe. This method of taking care of this kind of wear has reduced the expense of maintenance to practically nothing.

Coke oven floor where Super #3000 Cement has been poured into worn joints by means of a ladle mounted on a long pipe handle.



R & I #3000 REFRACTORY CEMENT

A pioneer and one of the most extensively used refractory cements in industry, R & I #3000 is a top quality, aluminum silicate base, ready mixed, plastic refractory material that air sets at normal temperatures and gains full strength without heat. It maintains its full strength under all operating conditions, withstanding intermittent firing and the expansion and contraction of refractory walls, high temperatures, flame impingement and other destructive heating conditions better than the fire brick, tile, block or other linings for which it is used.

The bond produced by a thin joint of #3000 Cement is actually stronger than the brick itself. The finely milled particles of #3000 penetrate into the brick pores and set extremely hard. It withstands high temperatures as well as #1 Fire Brick. Even for repairing worn or broken brickwork, the application of #3000 adds long periods of service since its strong bond prevents bulging, breaking or falling out of the patch.

Spraying of the refractory surface with an easily diluted coat of #3000 or wash-coating with a corn broom before firing, greatly prolongs the life of brick and joints.

As shown in the table of physical data two types of #3000 Cement are available: Type B has a somewhat lower working and fusion temperature but is stickier, creamier and generally easier material to use for thin joints. Type C is preferred by many users for its advantage of higher temperature resistance and its thicker consistency more suitable for trowelling.

Conveniently Packed — R & I #3000 Refractory Cement is a soft, plastic material packed in air-tight, heavy gauge steel drums containing 200 and 80 lbs., and in steel pails containing 50 and 30 lbs., ready for immediate use. Opened drums need only have the remaining contents covered with one-half inch of fresh water and then covered to retain the cement's full bonding quality.

HOW TO USE R & I #3000

For Thin Joints — Dilute R & I Refractory Cement to a heavy cream (batter) by adding about two quarts of water to every hundred pounds of cement. Mix thoroughly. Dip brick in the batter, so the surfaces of brick which come in contact with other brick or parts of the furnace structure will be covered with a thin coating of cement. Lay the brick in place and tamp with a trowel or mallet to obtain a good thin joint.

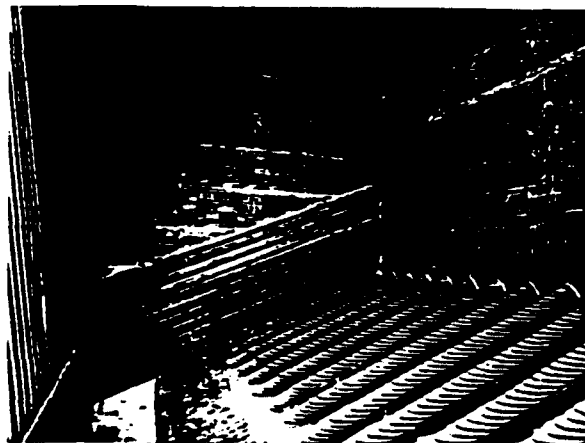
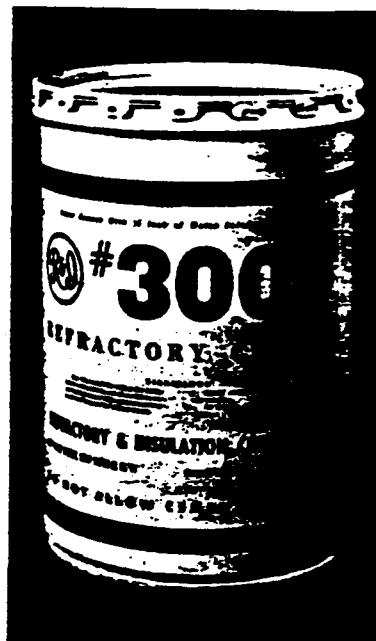
Cement that squeezes out of the joints should be troweled back over the brick as an added protection against firing temperatures. After the brickwork is complete, dip an old broom in the batter and wash-coat the entire refractory surface of the brickwork. This will fill up the pores in the brick and materially retard spalling.

For Repair Work — Walls of combustion chambers, fire doors and other brickwork that have become eroded by flame impingement should be patched with R & I #3000 Cement. If the erosion has just started prompt action will frequently save the setting.

For either hot or cold patching, clean the burned out section by chipping away all slag, old cement or foreign

matter. If a cold patch is to be made, wet the chipped out section with water and apply R & I #3000 Cement, being sure to press it firmly into place. If a hot patch is to be made, apply #3000 with a slice bar or patching tool and press it into place firmly. If cement spraying equipment is available, spray the cement into place until it reaches the desired thickness.

For Loose or Falling Brick — If the brick are still in good condition, clean them thoroughly of all dirt, slag, old cement, etc. Re-lay these same brick with R & I #3000 Cement, being careful to place the "unused" side on the working surface of the new wall. When the re-laying is complete, wash-coat the entire surface.



Interior of large boiler showing fire brick walls bonded with R & I #3000 Refractory Cement.



At left—Typical refractory wall of a large boiler in a bad state of repair, showing how broken and loosened joints have caused fire brick to fall out. At right, the same wall reset with new firebrick and #3000 Refractory Cement, thin joints being made, excess cement troweled back and the surface then entirely washcoated.

R & I REECO CEMENT

Because of its acid resisting properties, Reeco Cement has been developed for use with standard firebrick and silica shapes, where acid conditions exist. It is used extensively in acid type electric furnaces for patching jambs and spouts, and for ladles and on other steel mill furnaces where acid slag is produced.

For such patching work, Reeco is diluted with water and mixed in the proportion of 40% Reeco with 60% Ganister. For patching under the roof of electric furnaces, the brick must be first washcoated with a Reeco batter and then patched with a mixture of 50% Reeco and 50% Silica sand.

For lining large ladles, the brick should be set with Reeco Cement and then washcoated.

R & I JAMB PATCH

Jamb Patch is a very sticky plastic cement specially made for patching the cracks which develop between the jamb castings and the ends of the first walls of coke ovens. It may be rammed or troweled in place or mixed with water to the consistency of a heavy cream and shot into these cracks with a cement gun. For best results the cement should be first mixed with silica flour in equal proportions.

Jamb Patch bonds readily with iron jamb castings and the brick work at the end of the first oven flue wall. Surfaces of castings and brick should be free of loose or foreign material before Jamb Patch is applied.

APPLICATIONS

of R & I Refractory Bonding Cements

Laying brickwork, lining and settings in walls, floors, arches, baffles, jambs, doors of

Boilers	Coal Gas Retorts
Blast Furnaces	Water Gas Superheaters
Soaking Pits	Water Gas Generators
Heating Furnaces	Cupolas
Forge Furnaces	Oil Stills
Enameling Furnaces	Gas Producers
Melting Furnaces	Incinerators
Bake Ovens	Fire Boxes
Coke Ovens	Hot Blast Stoves
Kilns	Flues
Glass Tanks	Valves
Glass Lehrs	Varnish Kettles

Repairing—Hot or Cold Patching of any boiler, furnace or other equipment, walls, floors, arches, linings, baffles, joints, leaks, etc.

Surfacing—troweling, wash coating or spraying over refractory surfaces before firing.

Patching furnace and boiler walls and linings—using #3000 with crushed, reclaimed fire brick for monolithic construction.

Lining foundry ladles and spouts.



CASTABLE REFRACTORY MATERIALS

MOLDIT CHROME REFRACTORY CEMENT

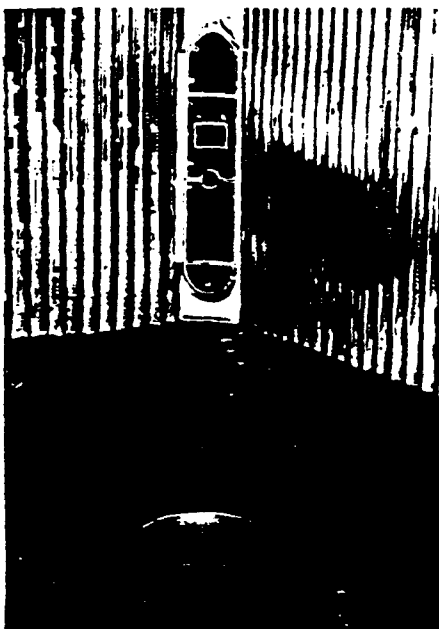
*A Chrome Base High Temperature Refractory
Easily Castable in Any Shape or Form*

*Highly Resistant to Slag
and Molten Metal*

*Can Be Poured, Troweled
or Applied with a
Cement Gun*



Moldit Chrome packed in heavy burlap bags containing 100 lbs. Material is of dry, granular, uniform quality.



Corner of slagging bottom boiler, showing water wall tubes and taphole in center of Moldit Chrome floor.

Unlike plastic chromes, R & I Moldit Chrome does not have to be pounded or hammered in place. It is simply mixed with water and poured or trowelled in place or can be applied with a cement gun, saving a great deal of time, labor and money in installation cost over the plastic type of chrome refractory. It weighs approximately 160 lbs. per cu. ft. molded in place and has a melting point of 3092°F. R & I Moldit Chrome may be sprayed, washed or submerged in water for any period of time without disintegration. It is resistant to molten slag, molten metal and spalling.

HOW TO INSTALL

R & I Moldit Chrome is furnished in dry form. It should be mixed with five quarts of clean fresh water per 100 lb. bag. After mixing with water, according to directions on red tag on bag, shovel the Moldit Chrome mix into place, and with a trowel work the mixture into corners and crevices so as to fill all voids.

Ramming the mixture in place is not necessary, just trowel to a smooth finish. Excessive trowelling is not recommended and trowelling of the surface should be kept to a minimum.

R & I Moldit Chrome also lends itself to installation in large areas with a dry Cement Gun, mixing with water at the nozzle. This is a very desirable way of installing the material both as to labor cost and the quality of the finished product.

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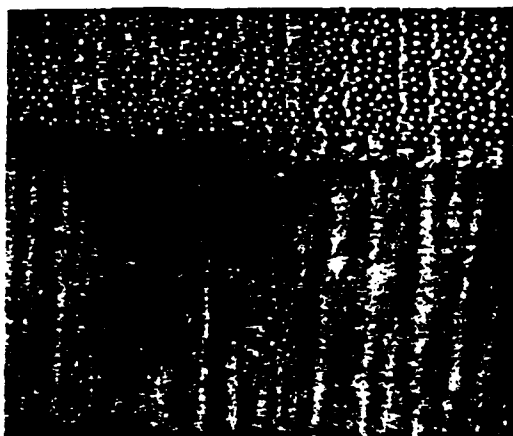
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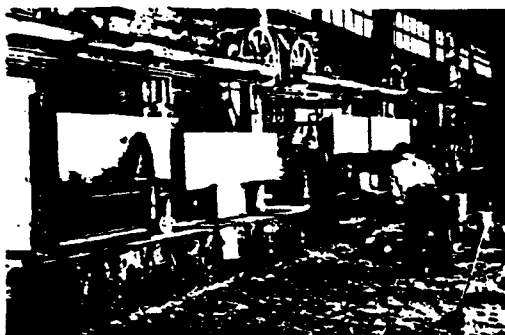
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R & I Moldit Chrome applied with a cement gun to the studded tubes on the inside of boiler wall as a protection against slag, corrosion and erosion.



Battery of forge furnaces the hearths of which were made with Moldit Chrome.

APPLICATIONS

Studded side walls and floors of slagging type boilers.

Floors of coal and oil fired boilers.

Monolithic hearths and bottoms in forging, rolling mill and tube mill furnaces.

Bolt and nut, bar, plate, angle and other steel heating furnaces.

Furnace tap holes.

Burner blocks and special shapes.

It is important, when placing Moldit Chrome in a furnace hearth, to build up the full thickness with each batch of material. Do not spread batch over batch over the area. Avoid layers. The proper way is to place the material in sections to the full thickness. R & I Moldit Chrome can be installed in any furnace cool enough for a man to work in.

HOW TO CURE

R & I Moldit Chrome should be allowed to set three to five hours until the surface has become hard and firm. The surface of the cement should be kept damp by spraying for 12 to 24 hours before putting it into service. Moldit Chrome should be fired slowly from five to six hours until regular operating temperatures are reached.

TECHNICAL DATA

Base—Chrome

Shipping Weight—100 lbs./ bag.

Installed Weight—160 lbs./cu. ft.

Melting Point—3092 F.

Highest Working Temperature—3000°F. (no load).

Working Qualities—Pours easily; trowels smooth; easily shot with gun.

Volume Shrinkage—None.

Storage—3 months maximum.

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REFRACTORY BONDING CEMENTS

HEAT SETTING CEMENTS

for Laying Fire Brick, Repairs and Washcoating



R & I general purpose dry heat setting cements have been developed for conditions where the bonding cement will allow for some movement of the brick walls during strains and expansion in heating up. This is true especially of very high refractory walls. As a rule they have higher refractory resistance than that of plastic bonding mortars recommended for use for severe firing service.

Mixed with water, they develop a uniform, plastic, easy workability so that good thin joints can be made in setting new brick, repairing eroded brick or replacing old brick and washcoating over brickwork.

Several types of R & I Dry Heat Setting Cements are available, each compounded to meet special conditions.

R & I #2700 CEMENT

Recommended for working temperatures to 2800° F., R & I #2700 is a semi-heat setting aluminum-silicate base refractory cement which possesses strong bonding qualities after start of vitrification at 900° F.

This Cement is shipped in dry form and, when mixed with water, is an exceptionally good fire brick setting mortar. 500 lbs. is required to set 1000 standard fire brick. It can be used with a gun or paddles, with a mixture of 70% of #2700 and 30% Reeco and applied to furnace baffles. This results in worthwhile fuel saving.

Weight—125 lbs. per cu. ft. installed. Packed in 100 lb. bags.

R & I FIRE CHECK CEMENT

R & I Fire Check is a heat setting mortar possessing exceptional physical and thermal resistance. Although its lowest working temperature is 1400° F., it is fully durable and serviceable up to 3090° F.—melting at 3142° F.

Where Fire Check is used as a brick bonding material, the usual stresses and strains which take place in brick being heated up to 1400° F. are neutralized before vitrification begins. In this way spalling and cracking of the brick are practically eliminated. Approximately 500 lbs. of Fire Check is required to lay 1000 standard fire brick.

A Fire Check and water mixture is uniform, plastic and easily workable. Ordinarily troweling will produce a good joint. Fire Check may also be used as a wash coat over refractory walls in which case it is mixed to a thin consistency and applied with a corn broom.

Weight per cu. ft. 125 lbs. Packed in 100 lb. bags.

R & I #3250 CEMENT

R & I #3250 Refractory Cement is a very finely milled, dry heat setting mortar for use up to 3090° F.

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PHYSICAL DATA

<i>R & I Product</i>	<i>Base</i>	<i>Highest Working Temperature (°F)</i>	<i>Lowest Working Temperature (°F)</i>	<i>Vitrification Temperature (°F)</i>	<i>Melting Point °F. (Orton Cone Test)</i>	<i>Lbs. to Set 1000 Fire Brick</i>
≡2700	Aluminum Silicate	2800	900	900	2939	500
Fire Check	Aluminum Silicate	3090	1400	2400	3142	500
≡3250	Aluminum Silicate	3090	1400	2400	3142	400
≡3450	Chrome	3000	1400	1400	3450	600

SERVICE DATA

<i>R & I Product</i>	<i>Form in Which Shipped</i>	<i>Lbs. per Cu. Ft. of Construction</i>	<i>Net Weight per Bag—Lbs.</i>
≡2700	Dry-Finely Ground	125	100
Fire Check	Dry-Finely Ground	125	100
≡3250	Dry-Finely Ground	125	100
≡3450	Dry-Finely Ground	160	100

It makes an exceptionally plastic mortar when mixed with water that keeps the material in uniform suspension and is easy to handle. Its lowest working temperature is 1400° F. #3250 Cement is readily absorbed by a refractory surface and is therefore a perfect cement for making very thin brick-to-brick joints and for washcoating refractory linings. When washcoating with #3250, a stiff broom should be used to loosen clay particles from and to scratch the brick surface in order to increase its porosity and effect greater adhesion.

In laying brickwork, figure on approximately 400 lbs. of ≡3250 to set 1000 standard firebrick with thin joints. Weight per cu. ft. installed—125 lbs. Packed in 100 lb. bags.

R & I #3450 REFRACTORY CEMENT

A chrome base cement of very fine texture and high melting point, R & I #3450 is ideal for the construction of those monolithic linings which must withstand molten metal and slagging conditions. For such work, the dry cement should be made just barely moist with about 3-4% of water by weight. Excessive moisture must be avoided as this will cause the cement to shrink. Linings prepared with ≡3450 are far more durable and resistant to erosion than those made with most ordinary alumina-silicate base cements.

R & I #3450 is also recommended for setting fire brick or chrome brick where a chrome base refractory joint is required.

When used to lay brick, about 600 lbs. of ≡3450 is required to set 1000 standard firebrick with joints of medium thickness.



REFRACTORY AND INSULATING SPECIALTIES

MOLDING MIX

R & I Molding Mix is a castable, hydraulic setting refractory cement for molding special tiles and intricate shapes in quantity. This cement is shipped dry and must be mixed, before using, with clean water, according to directions on the tag attached to each bag.

No pounding or ramming is necessary to obtain a dense, uniform refractory casting which has practically no firing shrinkage.

For molding special shapes in quantity, Molding Mix is quicker drying, allowing the forms to be removed more quickly, leaving an exceptionally smooth surface.

A high fusion point of 2552° F. permits R & I Molding Mix Refractory shapes to be used at temperatures up to 2400° F.

Molding Mix weighs 110 lbs. per cu. ft. molded in place. It is packed in 100 lb. moisture resistant bags.

BAFFLE MIX

R & I Baffle Mix is a hydraulic setting, castable refractory cement used to patch holes, cracks and loose tile in boiler baffles.

When mixed with water, the cement is very plastic and easy to handle by troweling or pouring. It may be safely used at temperatures up to 1500° F. and will materially increase the efficiency of boilers where holes or dry joints are found in baffles, which allow leakage of furnace heat into the other passes of the boiler.

When installed and dry, the cement weighs approximately 110 lbs. per cu. ft. It is packed in 100 lb. bags.

OVEN DOOR FACING

R & I Oven Door Facing is an adhesive type of castable refractory material for patching oven and furnace doors in one coat of not over 1½" in thickness. Keys should be provided for patching with this material.

Oven Door Facing should be applied when the door is as cool as possible to get the very best strength. It may be used at any temperature up to 2400° F.

All loose particles must be removed and joints raked out before applying this refractory.

The brick to be patched or coated should be soaked with water before the application of this patch.

For very best results, the cement should be allowed to dry 36 hours before the door is put back in service.

R & I Oven Door Facing is shipped in 100 lb. moisture resistant bags.

GUN CEMENT

R & I Gun Cement is a special refractory cement used for hot and cold patching with a pressure cement gun.

R & I Gun Cement is exceptionally useful where a large number of furnaces are in service and it is necessary to make emergency repairs when the furnace is either hot, cold or warm. This type of cement is usually used in large volume in steel mills, etc. where large operations are going on and a crew of cement gun operators are at the service of the various furnace divisions for emergency repairs.

It is recommended for temperatures between 2000° F. and 2800° F., and weighs approximately 100 lbs. per cu. ft.

Gun Cement is strong when used with a pressure gun. Considerable time and labor are saved when applied in this manner.

LOW TEMPERATURE MOLDIT CHROME

R & I Low Temperature Moldit Chrome is a chrome base castable refractory which is designed for use in forge furnaces and heating equipment where slag is present, but where the operating temperatures are not high enough to call for the use of regular R & I Moldit Chrome.

Low Temperature Moldit Chrome gains high strength at lower temperatures than ordinary chrome base castables and is therefore suitable for use in furnaces where temperatures are not high enough to bring the ordinary chrome cements up to full strength.

Low Temperature Moldit Chrome does not bloat and is very resistant to abrasion.

Simply mix each 100 lb. bag with 7 qts. (14 lbs.) of clean, cool, fresh water and then pour in place. After pouring, it should be kept damp for at least 15 hours and if possible, 24 hours to insure proper curing. It should be used within a half hour after mixing.

When ready for firing Low Temperature Moldit Chrome should be thoroughly dried out with a slow fire. It should then be fired up to a temperature of 2200° F. for a short period, after which the temperature can be dropped back to furnace operating temperature. It is then ready for use.

MIX #100

R & I Mix #100 is a chrome base cement used for hot patching by means of a gun. It has a melting point over Cone 30 and can be used at temperatures up to 3000° F. when no load is present. Being of chrome base, it is ideal for use where slag is present.

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CHROME PATCHING CEMENT

R & I Chrome Patching Cement is very similar to Mix #100 in that it is a chrome base refractory designed for hot patching purposes. The chief difference between the two refractories is that Chrome Patching Cement is made of large granules, not designed for application with a gun.

It is excellent for use where high temperatures and slag are present. It simply has to be mixed with water and shoveled or troweled in place.

BLACK FURNACE CEMENT

R & I Black Furnace Cement is a ready-mixed, plastic, air-setting refractory cement, ideal for application on metal surfaces, which can be used at temperatures up to 1500° F. It adheres to metal better than ordinary refractory cements and is not subject to excessive cracking which usually takes place in quick drying, fast setting cements of this type.

It is used extensively in residential boilers for sealing sections against gas leakage; also around smoke pipes, etc. In industrial boiler plants it is used around stokers and where contact between brick and metal surfaces requires sealing.

Packed in 4# cans (12 cans per carton)
15# cans (6 cans per carton)
30# pails
50# pails
80# drums

HYTEMP FLEXIBLE COMPOUND

This product is an adhesive flexible material which can be used up to 600° F. for battens and other metal sliding surfaces where air leakage must be eliminated and a material is required that will not harden and bind the metal surfaces together against movement.

Coverage—about 86 lbs. per cu. ft.

Packed in 2, 3½ and 5 gal. metal containers, about 10 lbs. per gallon.

EXPANSION JOINT MATERIAL

R & I Expansion Joint Material is a high temperature, fibrous, expansion joint material which can be caulked in place.

When used at temperatures within its limit of 2000° F., this product has a certain amount of springiness and give-and-take. It will not push out of expansion joints where it has been caulked in place.

It gives much better service than the ordinary asbestos rope commonly used for this purpose—is much lighter, is far less costly to use and is, overall, a much more satisfactory product.

Weight per cu. ft.—8 lbs. Packed in 25 lb. paper bags.

MASTIC COATING

R & I Mastic Coating is an asphalt water-proof coating used as a protection against corrosion of metal surfaces at temperatures which are usually too high for most coatings. Its resistance to mild acid solutions makes it particularly useful for coating ash hoppers, underneath refractories.

Mastic Coating is also recommended for painting of steel reinforcing used inside of castable refractory materials to take up expansion of the metal when heated, so that this expansion will not crack the refractory.

R & I Mastic Coating is also used as a coating for Insulating Block, where castable refractory cement is poured over the Block. It prevents the block from absorbing moisture from the castable refractory thereby reducing the cement's strength.

Application—Metal surfaces to be coated with Mastic Coating must be clean of all scale, rust, dirt, oil and grease and must be completely dry.

Preparation of surfaces is similar to that employed in any ordinary good painting practice.

Coverage—One gal. of Mastic Coating will cover 250 to 300 sq. ft. of clean, smooth, steel surface.

Over R & I Insulating Block, one gallon will cover approximately 25 sq. ft. of surface.

Packed in 5 gal. and 1 gal. containers.

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CE0114048



RAMMING REFRACTORY MATERIALS

PLASTIC FIRE BRICK

**EASILY RAMMED OR POUNDED
DIRECTLY INTO PLACE
SOLID • JOINTLESS • DURABLE**

R & I Plastic Fire Brick eliminates the troubles inherent in certain fire brick construction and makes quick repairs of worn-out, broken or eroded refractory sections, large or small. It can be economically pounded or rammed into many shapes and into any repair job.

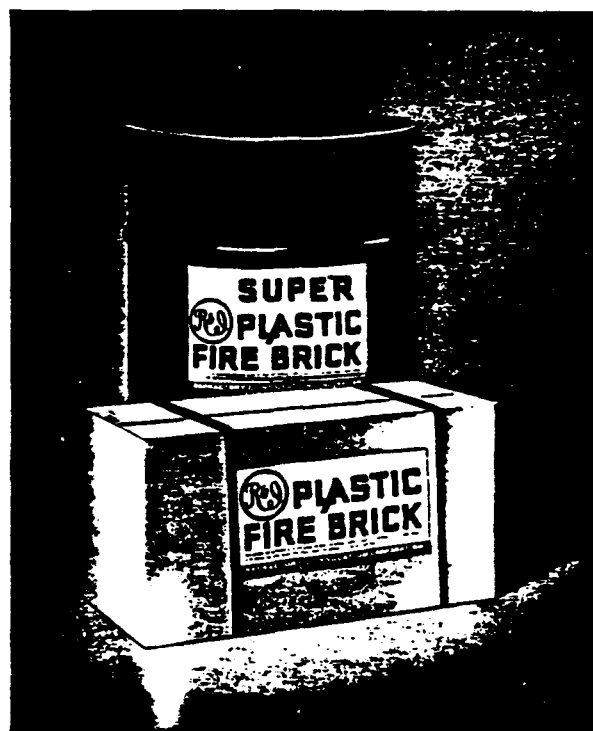
R & I Plastic Fire Brick is a ready mixed, extremely dense, uniform refractory mixture of the best grades of clay and crushed calcined fire clay with just enough moisture to make it thoroughly plastic. No water need be added to make it workable. It is durable—withstands great loads. Since it can be rammed into a single monolithic section, it offers no joints or openings for flame or gases to leak through or erode. It is highly resistant to spalling. Not only does it make a rugged installation which withstands thermal abuse, but it actually strengthens the refractory construction adjacent to it.

Because of its density, plasticity and ease of application, R & I Plastic Fire Brick is readily workable into small or large areas with the assurance of long service and low maintenance costs.

Being jointless, R & I Plastic Fire Brick is not subject to the service weaknesses inherent in fire brick. There are no joints to crack open under expansion and contraction, no fusion or spalling of the edges, no loosening of fire brick, no bulging walls.

EASY TO INSTALL

R & I Plastic Fire Brick can be installed by unskilled labor. It may be applied by ramming or pounding the material with a wooden mallet or steel hammer, knitting the small pieces firmly into place to make a solid, homogeneous, rigid refractory structure. Where the equipment is available or the size of the construction or repair job warrants it, the use of pneumatic or electric hammers is perfectly safe and justifiable on the basis of labor savings.



For complete settings, old linings, all loose material and dust should be removed, leaving a clean section. Then coat the outer wall with a layer of R & I #3000 Refractory Cement to assure perfect bonding of the material to the wall. Monolithic walls should be built to a minimum of 4" and preferably greater thickness. After ramming in place, the material should be punctured with a 6 penny nail on 4" to 6" centers to a depth equal to half its total thickness.

After drying out and cooling, a wash-coating of the surface with R & I #3000 Refractory Cement helps fill in any minor pores or imperfections and makes a perfect heat resisting refractory surface.

Where only a part of the contents of a carton of Plastic Fire Brick is used, the material should be covered with wet rags and kept in a cool place to prevent drying out.

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Six ready cut slices of R & I Plastic Fire Brick each 2" thick, removed from carton, easy to handle and apply.



Pounding Plastic Fire Brick into place along refractory boiler wall.

TWO TYPES OF MATERIAL

R & I Plastic Fire Brick is made in two types to meet working and temperature conditions, in accordance with the following data:

Plastic Fire Brick

Vitrification at 1400° F.
 Highest working temperature—3000° F.
 Melting point—3142° F.
 Weight per cubic foot of material installed—135 lbs.
 Packing—in heavy, moisture proof, air tight cartons containing 100 lbs. of material, sliced into 6 equal slabs, each 2" thick.

To dry out the refractory, after installation, a slow fire should be started, increasing it gradually until the moisture is removed and the vitrification temperature is reached. It then may be considered definitely dried out and ready for service.

Super Plastic Fire Brick

A super duty, plastic fire clay refractory.
 Vitrification at 2100° F.
 Highest working temperature—3100° F.
 Melting point—3245° F.
 Weight per cubic foot of material installed—135 lbs.
 Packing—in steel drums suitable for ocean shipment; approximate net weight—200 lbs.

Immediately after installation, the refractory should be dried at from 200° F. to 300° F. until the water has been removed (for approximately 12 hours), when it will cease steaming. Then a hot fire can be started and raised as rapidly as possible to a minimum of 2200° F., and held there for 3 to 4 hours. It can then be put into service.

APPLICATIONS

R & I Plastic Fire Brick is used extensively in both large and small industrial boilers and furnaces for

- Oil or Gas Burner Fire Box Linings
- Burner Arches and Ports
- Boiler Refractory Wall Repairs
- Sealing Dead-Plates on Stokers
- Protecting Boiler Rivets in Water-Leg Boilers
- Packing Around Stoker and Boiler Pipes
- Monolithic Bridge Walls
- Door Arches and Jambs
- Refractory Backing for Water Walls

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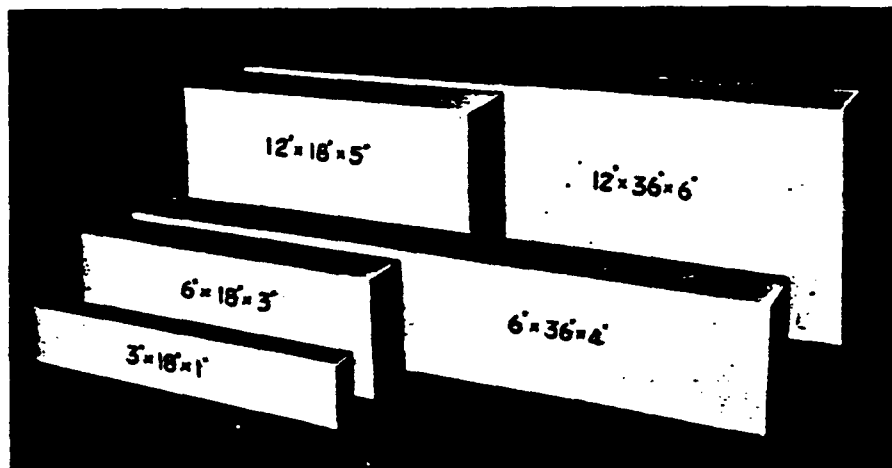


HEAT INSULATING MATERIALS

INSULATING BLOCK

for Efficient Insulation and Heat Resistance to 1800°F.

Strong - Light
Resilient
Resistant to
Steam and Water
Low Thermal
Conductivity
Easy to Handle
Easy to Apply



The Ideal Single Layer Insulation for High or Low Temperatures



R & I Block can be easily cut or sawed at any angle, into rectangular or irregular shapes, and made to fit without cracking, splitting, fraying at the edges or crumbling.

R & I Insulating Block is a material of superior insulating quality, which provides the highest thermal efficiency consistent with good structural strength and low application cost. Because of its low heat conductivity at high or low temperatures, its single layer construction eliminates the need for combination or two-layer construction, thereby saving materially on application costs. R & I Block is made to withstand temperatures up to 1800°F.

Strong — Easy to Install

R & I Insulating Block is molded from chemically stable, inert, heat-resistant materials and long fiber asbestos. Bonded, cured, molded and dried, it provides a block that is exceptionally strong, non-sagging, non-crumbling, yet light, easy to handle and easy to cut into any size and shape. R & I Block is of uniform thickness, has firm, sharp edges which make close, square butt joints, when installed. It resists vibration, compression, impact and abrasion to a remarkable degree.

Two Types of Block

#14 Insulating Block for continuous contact with hot face temperatures to 1400°F. Its flexural strength shows an average modulus of rupture of 60 p.s.i. Density—24 lbs. per cu. ft.

#18 Insulating Block for continuous contact with hot face temperatures up to 1800°F. and for intermittent contact of 1900°F. Its flexural strength shows a modulus of rupture average of 60 p.s.i. Density—25 to 26 lbs. per cu. ft.

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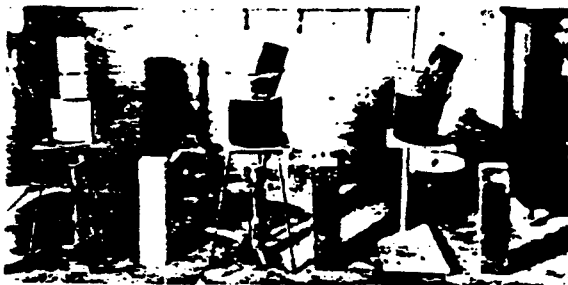
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Comparative water resistance test: R & I Insulating Block in boiling water (beaker at left) stands firm and rigid. Mineral wool block in boiling water (middle beaker) and in cold water (beaker at right) deteriorates almost immediately upon immersion.



Condition of R & I Block and mineral wool block, after water has been drained out.



Refractory tile of boiler wall in place behind boiler tubes being backed up with R & I #14 Insulating Block.

R & I #14 Insulating Block applied to boiler wall in back of refractory and held temporarily in place by R & I Block-Stic Cement, prior to installing boiler casing.

Moisture-Resistant

This block is not affected by moisture. A steam-filled room, a dripping pipe joint, or even complete submersion in boiling water has no ill effects on this remarkable insulation. It dries out without shrinkage to its original shape, sound and strong without structural deterioration of any kind.

SPECIFICATIONS

Both R & I Insulating Blocks are made in:

Thicknesses — 1" to 12".

Standard Sizes: Block up to 2" thick—3" x 18", 6" x 18" and 12" x 18" only. All greater thicknesses—3" x 18", 6" x 18", 6" x 36", 12" x 18" and 12" x 36".

LIST PRICES

Subject to Discount

Block Thickness	Price Per Sq. Ft.	Block Thickness	Price Per Sq. Ft.
1/2"	\$0.27	2-3/4"	\$0.83
3/4"	0.27	3"	0.90
1"	0.30	3-1/4"	0.98
1-1/4"	0.38	3-1/2"	1.05
1-1/2"	0.45	4"	1.20
1-3/4"	0.53	4-1/2"	1.35
2"	0.60	5"	1.50
2-1/4"	0.68	5-1/2"	1.65
2-1/2"	0.75	6"	1.80

Prices on thicknesses greater than 6" and on segmental (curved) block and special sizes, on request.

THERMAL CONDUCTIVITY

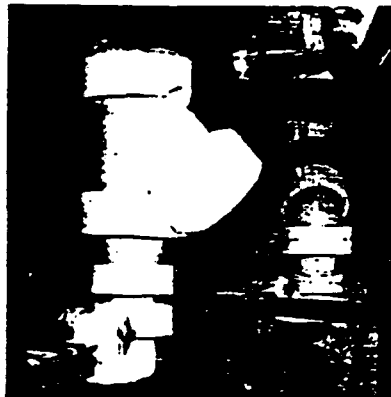
B.t.u./Sq.Ft./Hr./1" Thick/1°F. temperature difference

Mean Temperature °F.	Conductivity
200	0.40
400	0.48
600	0.58
800	0.69
1000	0.80
1200	0.93
1400	1.06

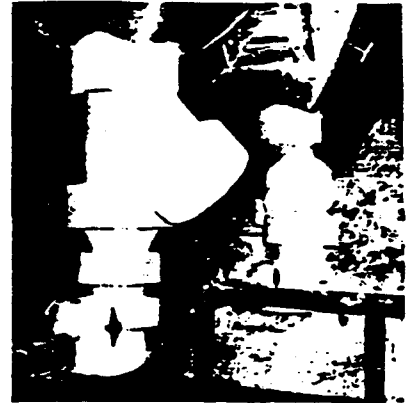




First step—Stic-Tite Cement roughed, followed while still wet with 2" wire mesh.



Second step—Flanges blocked in with #14 Insulating Block, mitre cut and wired in place.



Third step—Finish rough coat of Stic-Tite applied over insulated surface, ready for final hard finish.

These three views show how valves of precipitators were insulated with R & I Stic-Tite Insulating Cement and #14 Insulating Block to prevent condensation and freezing of particles within the valves.

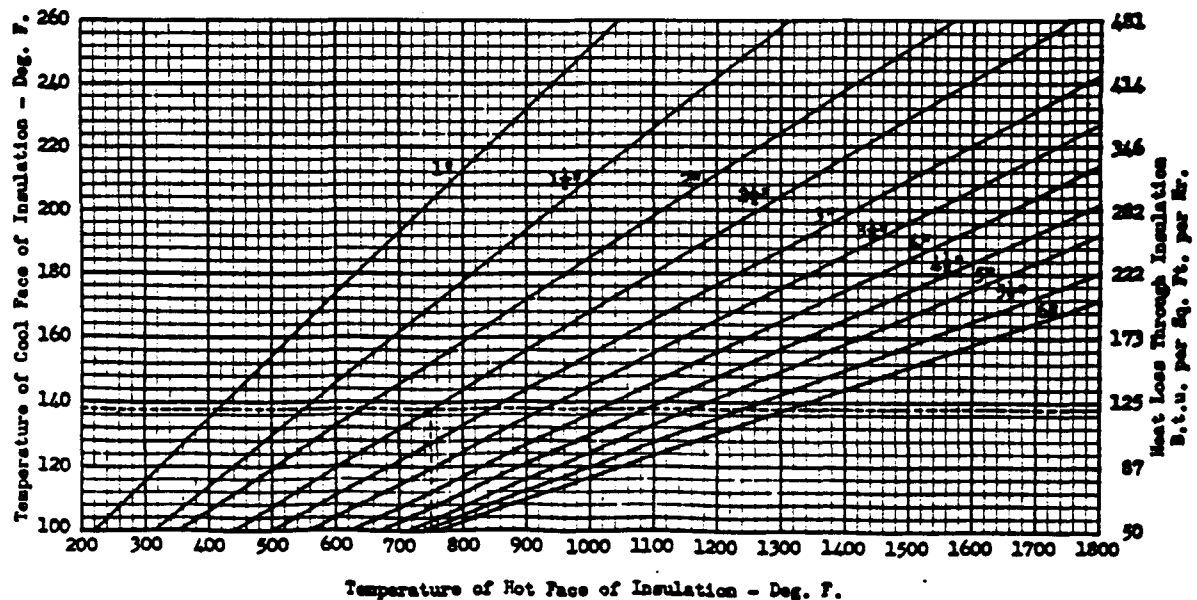
HOW TO SELECT REQUIRED BLOCK THICKNESS

The thickness of insulating block to use depends on the temperature of the surface to be insulated, on the temperature on the outside surface of the block and the heat saving desired, within reasonable economic limits.

For example, on the heat transmission chart (below), if a hot face temperature of 750 deg. F. is assumed and

a cool face of insulation at 138 deg. F. is wanted, follow 750 deg. on horizontal scale of chart upward to horizontal line from 138 deg. at left. Where the two lines intersect, find 2½" of block as the nearest covering thickness required. To find the heat loss, extend horizontal line to right and read about 121 B.t.u. per sq. ft. per hr.

HEAT TRANSMISSION R & I INSULATING BLOCK





Steel panel wall of large heat treating oven insulated with R & I Insulating Block.



Recirculating tank in steam dryer system covered with 2" of R & I Insulating Block and $\frac{1}{2}$ " of Super-Finish Stic-Tite Insulating Cement.

HOW TO APPLY AND FINISH

R & I Insulating Block may be applied to flat or curved refractory surfaces by one of several methods:

By spotting R & I Block-Stick, a very adhesive material, on the Block in about three places and firmly rubbing the Block against the Refractory or steel contact surface in order to spread the Block-Stick somewhat over the surface. This will hold the Block safely in place until the necessary permanent reinforcement is provided.

Tie wires are often used to hold the Block in place permanently. These are previously anchored into the joints or behind the refractory and are long enough to project through the refractory and beyond the Block. The Insulating Block is then applied, and over the surface of the Block mesh wire can be tied tightly against the Block with these tie wires. The mesh wire also provides reinforcement for the finish cement.

When Insulating Block are used on metal surfaces, either inside or outside, tie wires or whiskers are welded to the metal surface to be insulated. These tie wires or metal whiskers should extend about $1\frac{1}{2}$ " beyond the thickness of the Block and can then be bent over either mesh or expanded metal lath to hold the Block in place as well as provide a holding agent for the finishing material.

Where block is laid in steel panels or back of furnace walls which have a steel plate casing, no tie wires are necessary.

To provide a hard, durable finish coat, the application of R & I Super Finish Stic-Tite in one coat directly on the metal lath or mesh is recommended. A $\frac{3}{4}$ " thickness provides a good protection.

For service outdoors, the application of a coat of R & I Weatherkote, a tough, waterproof material is recommended.

INDUSTRIAL APPLICATIONS

In Power Plants

Accumulators, Steam
Boilers: Fire Tube, for boiler shell, wall or settings
Boilers: Round, Sectional or Water Tube
Boiler Drums, Air Cooled or Water Cooled Walls
Boiler and Engine Room Ceilings
Breechings and Ducts
Fan Housings
Heaters, Feed Water
Heaters, Hot Air
Heaters, Hot Water
Storage Tanks
Turbines

Industrial Drying Equipment

Dryers
Enameling Ovens
Heat Treating Ovens
Core Ovens

Metallurgical and Metal Working

Hot Blast Stoves
Open Hearth Regenerators
Steel Mill Furnaces
Heat Treating Furnaces

Cement and Lime Plants

Producer Gas Mains
Rotary Kilns

Ceramic Plants

Glass Tank Generators
Glass Lehrs
Kilns, all kinds

Oil Refineries

Oil Field Boilers
Oil Still and Cracking Unit Furnaces
Steam Stills
Towers, Condensers, Heat Exchangers
Hot Tanks

Gas-Making Equipment

Insulating between Shell and Carburetor
Generators and Superheaters
Producer Gas Mains
Pulverizers
Tanks
Steam Accumulators

Chemical—Food—Brewing

Hot Kettles and Cookers
Hot Tanks and Process Piping
Rubber Vulcanizers

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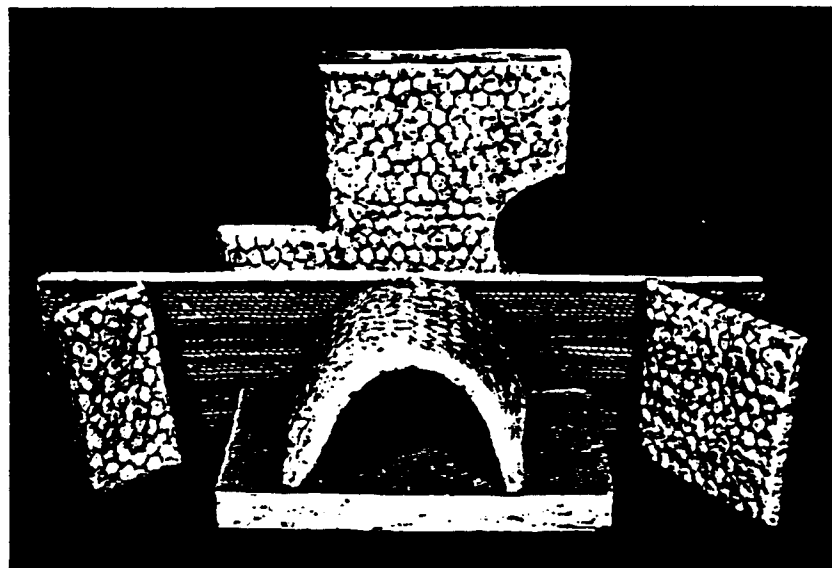
HEAT INSULATING MATERIALS

MINERAL WOOL BLANKET INSULATION

for Large or Small Surfaces — Flat or Curved

Laminated for Greater Insulating Efficiency and Strength.

R & I Blanket Insulation is made in both standard and special sizes. Curved or irregular shapes and blankets with cut-outs can be furnished in accordance with blueprints.



For operating temperatures to 900 deg. F., R. & I Mineral Fibre Blankets offer a most economical, efficient insulation for flat or curved surfaces, large or small. Experience shows that this type of insulation combines the advantages of lower heat conductivity, greater durability and flexibility of application at lower cost than other types of insulation in the temperature range for which it is recommended.

HIGH QUALITY

R & I Insulating Blankets are made of long mineral fibres which aggregate into a soft, flexible, clean white wool of uniform consistency. This wool is treated to improve its resilience and flexibility and then is laminated and rolled into sheets about $\frac{1}{2}$ " thick. A blanket is built up to the desired thickness by a series of layers of these laminated sheets, then compressed and wire stitched under pressure so as to make it uniformly dense, smooth and firm. This exclusive R & I method produces a superior insulation because

- 1—It avoids the usual unevenness of wool distribution through packing of bulk loose wool onto expanded metal or of single slabs of wool inserted between layers of wire mesh or lath.
- 2—The laminated or precompressed layers of R & I Blankets cannot slide or open up holes which produce hot spots when in service.
- 3—The edges of the R & I Blanket are sharp and can be butted closely against each other for tight fit over the hot surface.

4—The R & I Blanket is light in weight—containing no inefficient binder; yet it is strong and flexible. It is so tough that the wires could be removed and the inserted wool handled without tearing.

5—R & I Blankets are clean, white and attractive in appearance.

LOW HEAT CONDUCTIVITY

R & I Blanket Insulation has a greater overall efficiency over a greater range than other types of insulation, whether they be in the low or high temperature class. Its conductivity per inch of thickness at mean temperature is less than that of air cell, 85% Magnesia or high temperature insulating block and is about 10% more efficient than other types of mineral wool blankets.

STRONG — DURABLE

R & I Blankets combine strength and serviceability through proper packing, laminating and reinforcement with tie wires between either wire mesh, expanded metal lath or special rib lath, depending on whether flexibility or rigidity is required in the finished blankets. They do not fray at the edges, peel, crack, break, dust or settle down in shipment or installation, maintaining their full body and thickness under all normal service conditions.

R & I Blankets are fireproof, verminproof, resistant to moisture and to sound transmission.

REFRACTORY & INSULATION CORPORATION

MANUFACTURERS OF REFRACTORY BONDING AND CASTABLE CEMENTS, INSULATING BLANKETS, BLOCK AND CEMENTS

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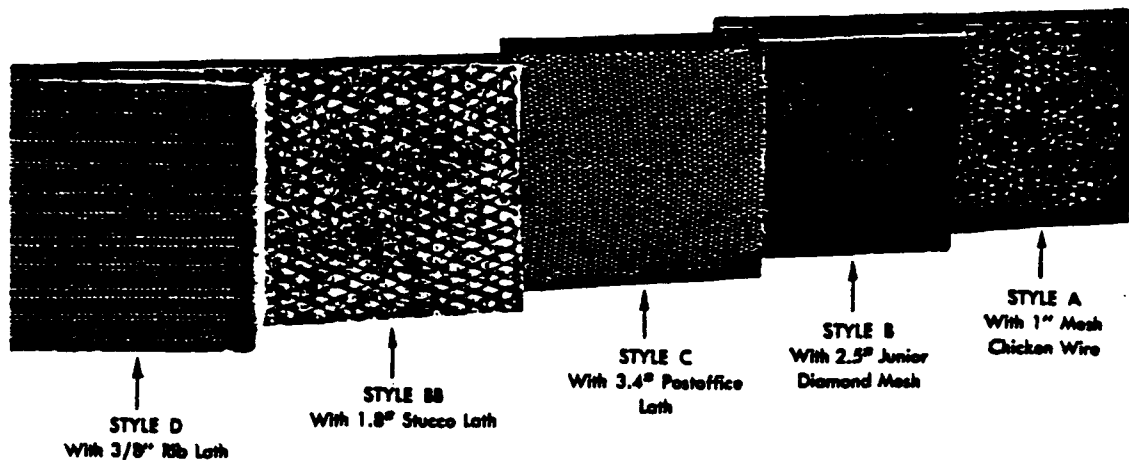
1001 Broad St.
Newark 2, N. J.

1836 Euclid Ave.
Cleveland 15, Ohio

Catalog No. I-37

CE0114055

CE/HI (F) 33120



STANDARD TYPES AND SIZES

R & I Insulating Blankets are sewed with galvanized wire between several different types of metal fabrics, depending upon the service for which they are intended. They are held to uniform thickness with overall dimensions true and square and with edges cut smooth. These types are:

- Style A — 1" wire mesh both sides of blanket.
- B — 1" wire mesh one side, metal lath other side.
- BB — 1" wire mesh one side, 1.8" stucco lath other side.
- C — Metal lath both sides.
- *D — 1" wire mesh one side, $\frac{3}{8}$ " rib lath other side.
- *E — Metal lath one side, $\frac{3}{8}$ " rib lath other side.
- *F — 1" wire mesh one side, $\frac{3}{4}$ " rib lath other side.
- *G — Metal lath one side, $\frac{3}{4}$ " rib lath other side.
- *H — $\frac{3}{8}$ " rib lath both sides.
- J — No. 12 mesh fly screen both sides.
- Z — Wire mesh one side, fly screen and expanded metal lath other side and edges.

* In the rib lath reinforcement, all ribs are turned in and run lengthwise unless otherwise specified. Where the application calls for an air space between the hot surface and insulation, a turned out rib lath is used to provide that air space.

Size—R & I Blankets are made in 2 ft. by 4 ft., and 2 ft. by 8 ft. sizes. Special sizes are manufactured to desired specifications.

Thickness—Any blanket thickness from 1" to 6".

Packing—All R & I Blankets are packed in heavy, fibre board (500 lb. test) cartons, which provide ample protection in shipment. On overseas shipments, sturdy, wooden boxes circled by steel straps can be provided.

LIST PRICES PER SQUARE FOOT

Subject to Discount

Thickness in Inches	Style A	Style B	Style BB	Style C	Style D	Style E	Style F	Style G	Style H	Style J	Style Z
1	\$0.40	\$0.45	\$0.45	\$0.55	\$0.60	\$0.60	\$0.70	\$0.75	\$0.75	\$0.60	
1 $\frac{1}{4}$	.45	.53	.53	.60	.65	.65	.75	.83	.83	.65	
1 $\frac{1}{2}$	.50	.60	.60	.65	.70	.70	.80	.90	.90	.70	
1 $\frac{3}{4}$	.55	.65	.65	.70	.75	.75	.85	.95	.95	.75	
2	.60	.70	.70	.75	.80	.80	.90	1.00	1.00	.80	
2 $\frac{1}{2}$	.70	.80	.80	.85	.85	.90	1.00	1.10	1.10		
3	.80	.90	.90	.90	1.00	1.00	1.10	1.20	1.20		
3 $\frac{1}{2}$	.88	.98	.98	1.03	1.08	1.08	1.18	1.28	1.28		
4	.95	1.05	1.05	1.10	1.15	1.15	1.25	1.35	1.35		
4 $\frac{1}{2}$	1.03	1.13	1.13	1.18	1.23	1.23	1.35	1.45	1.45		
5	1.10	1.20	1.20	1.25	1.30	1.30	1.45	1.55	1.55		
5 $\frac{1}{2}$	1.18	1.28	1.28	1.33	1.38	1.38	1.55	1.65	1.65		
6	1.25	1.35	1.35	1.40	1.45	1.45	1.65	1.75	1.75		

Prices on application

HOW TO SELECT THE PROPER THICKNESS

The minimum thicknesses of blanket insulation to use on the hot surface are as follows:

Temperature—deg. F. of Equipment		Thickness of Blanket				
200	300	500	700	900		
1"	1½"	2"	2½"	3"		

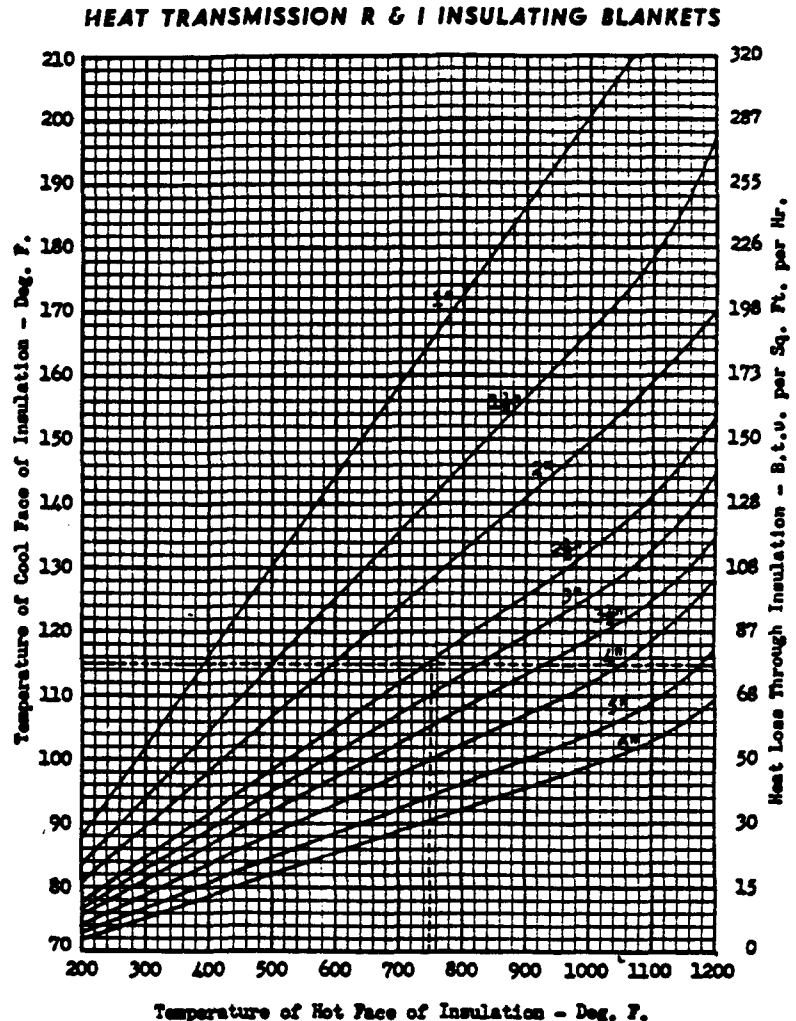
It is obvious that the greater the thickness for corresponding temperatures the greater is the heat saving. There is, however, an economic limit to insulation thickness vs. heat saving. To determine the thickness of insulation required, two factors must first be determined:

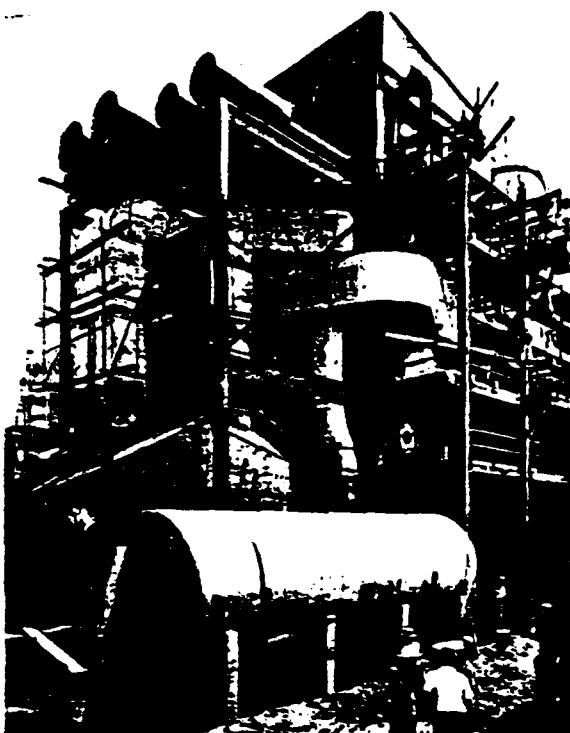
- The outside surface (or face) temperature desired.
- The heat loss through a given thickness.

The chart above shows the relationship between the hot face of the metal or refractory equipment under the insulation and the cool face on the outside of the insulation. If, for a given hot face temperature, a certain cool face temperature is desired, the correct thickness of insulation to specify is determined by drawing a line vertically from the hot face temperature scale to intersect at right angles with the horizontal line drawn from the cool face temperature scale.

Example:—If the hot face temperature is 750 deg. F. and the cool face of insulation desired is 115 deg. F., the thickness of insulation to use is 2½". By reading straight across to the extreme right, the heat loss is given, which, in this case is 78 B.T.U. per sq. ft. per hour.

Conversely, if it is desired to insulate for a heat loss of 50 B.T.U. per sq. ft. per hour, trace the line at 50 B.T.U. horizontally to where it meets the vertical line at 750 deg. F. hot face and read 4" thickness (approximately); then extend line to left to read a cool face temperature of 100 deg. F.

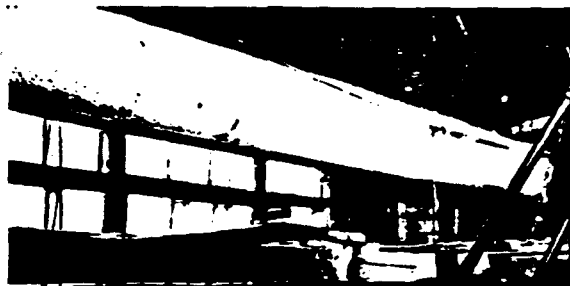




R & I Style B Mineral Fibre blankets installed on the ducts of a large boiler.



Storage tanks covered with R & I Insulating Blankets, over which is applied a coat of R & I Super Finish Stic-Tite Insulating Cement, and protected by R & I Weather-kote against rain and weather.



A 25' section of tie line to power plant boilers covered with precurved blanket insulation.

INDUSTRIAL APPLICATIONS

Power Plants

Accumulators, Steam
Boilers, Water Cooled Walls
Boilers, Round or Sectional
Boilers, Waste Heat
Breechings, Externally
Ceilings, Boiler Room
Ducts, Hot Air
Fan Housings
Heaters, Feed Water
Heaters, Hot Water
Stacks, Steel, Externally
Tanks, Hot Water Storage
Turbines

Heaters, Air
Spray Dryers

Paper Mills

Digesters, Pulp
Boilers
Evaporators

Breweries

Brew Kettles
Cookers
Lauter Tubs
Tanks, Hot Water

Oil Refineries

Boilers, Oil Field
Boiler Breechings
Condensers
Heat Exchangers
Still
Tanks
Towers

Transportation

Boilers, Locomotive
Railway Tank Cars
Tank Trucks

Domestic Equipment

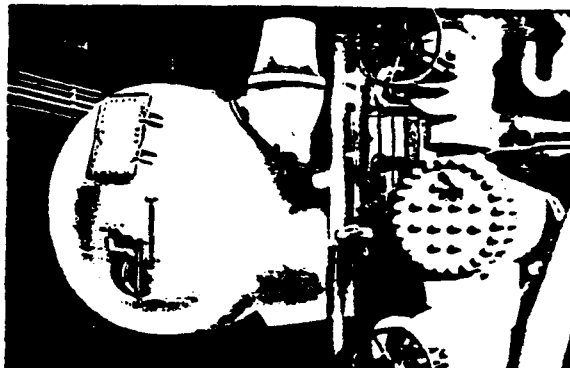
Oven Panels and Doors
Ducts

Industrial Ovens

Insulating between steel
panels of
Ovens, Enameling
Ovens, Core
Ovens, Drying

Chemical Processing

Precipitators
Reactors
Tanks
Vulcanizers



Hot water tank in large power plant insulated with 2" of R & I Blankets and a hard, protective coat of Super-Finish Stic-Tite Insulating Cement.



HEAT INSULATING MATERIALS

STIC-TITE PLASTIC INSULATION

Strong • Light • Adhesive

Easy to Apply

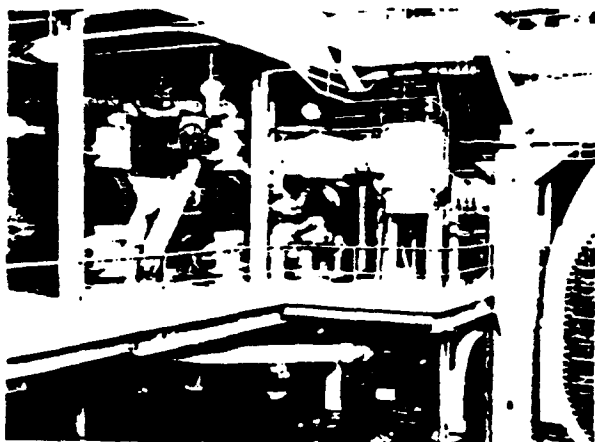
Gives Maximum Coverage

Durable • Reclaimable

Very Efficient to 1800°F.

Stic-Tite is a plastic material that is outstanding for its economical coverage of heating and heat transfer equipment and for its superior insulating efficiency. It is a special R & I mineral and diatomaceous earth fiber, dry granular composition which requires only mixing with clean water to be ready for easy use. It adheres to any clean surfaces and stays on under practically all conditions to 1800°F.

In compounding Stic-Tite, every consideration was given to combining into one insulating cement the important physical properties of plasticity, ease of application, lightness, adhesiveness and strength over a wide range of temperature to provide an insulation of maximum thermal efficiency.



Piping, valves, flanges, etc. fittings in a power plant heating equipment system covered with Stic-Tite and troweled to a smooth finish.



Bag of Stic-Tite showing uniform, dry material (left) and ready-to-apply plastic mass. Packed in 25. and heavy lined paper bags containing 50 lbs.

HIGH INSULATING EFFICIENCY

Stic-Tite's high insulating value lies in the distribution of billions of minute dead-air cells, uniform in size, which are imprisoned in the spongy, porous mass, after the material has been applied. These resilient cells, which remain intact even after the material has dried out, are well isolated from one another, providing a firm and positive check against air infiltration.

AN ALL-PURPOSE INSULATION

Stic-Tite has been tested and proven over the years in extensive service in power plants and industrial heat processing equipment of all kinds, ducts, piping and fittings. With its efficient coverage for heat insulating requirements up to 1800°F., it is truly an all-purpose insulation that precludes the need for several types of insulation that are limited in temperature and application. It can be used on metal, tile, brick, glass or any other clean surface, hot or cold, adhering permanently, without lifting off or shaking loose even when subjected to severe vibration, abrasion or impact. For greater thickness or for covering large, unsupported areas, wire mesh or pencil rod reinforcement is advisable to give the Stic-Tite insulation greater rigidity and durability.

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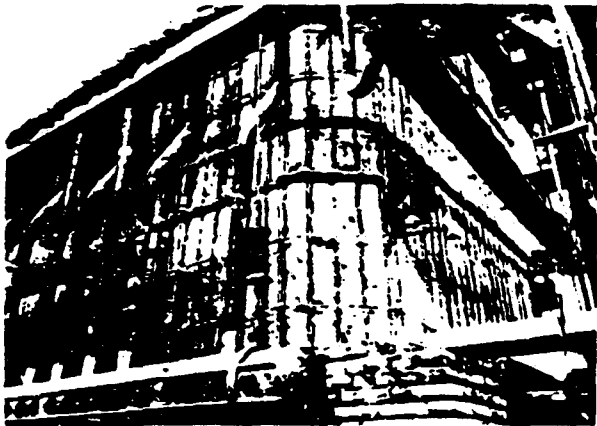
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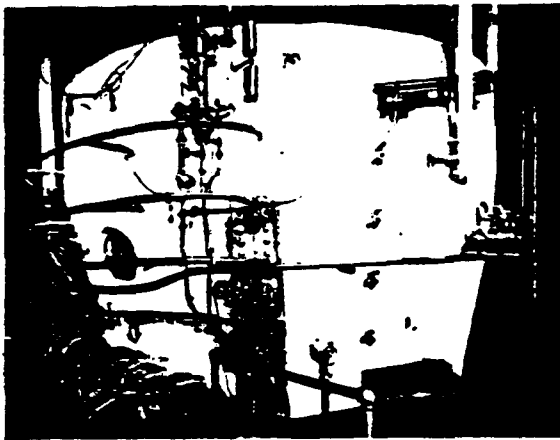
Catalog No. 1-52

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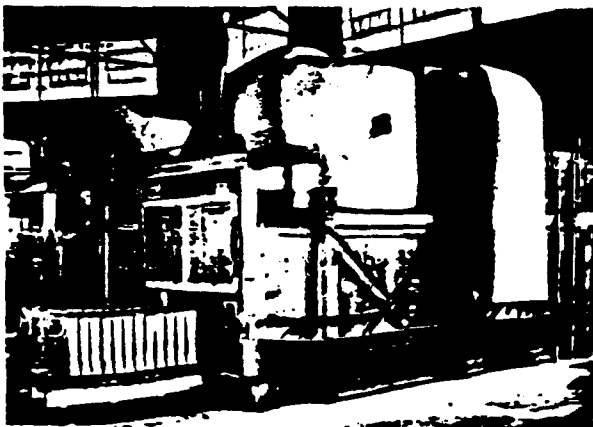
CE/HI (F) 33124



Water walls of large boiler in a pulp and paper mill insulated with 6" of Stic-Tite over pencil rod reinforcement. Rough coat shown later covered with a smooth finish coat of cement.



Stic-Tite can be readily applied over the surface to the desired thickness. Note how smoothly and completely it is molded around the fittings and openings of this water gas generator.



Two aluminum annealing ovens with oil fired air heaters, recirculating fans and ducts insulated with Stic-Tite.

EASY TO APPLY

Its plastic consistency makes it easy to mold Stic-Tite around pipes, flanges, over or under equipment, difficult places and into difficult shapes. It may be molded by hand or troweled. No special skill is needed to apply. Stic-Tite contains no harmful ingredients, hence it is perfectly safe to handle with bare hands.

Stic-Tite dries to a one-piece, seamless, jointless covering which does not permit loss of heat. It makes a clean, smooth finish requiring no other finishing coat. It may be sized or painted. It can be first applied as a roughing coat and later troweled to a smooth finish with the same material from the same batch. While not waterproof in itself, Stic-Tite may be easily and efficiently waterproofed with R & I Weatherkote.

BETTER COVERAGE

Because Stic-Tite dries with a minimum of shrinkage in thickness, less of it is required to provide the required insulation than of other insulating cements. An inch of Stic-Tite applied wet remains practically an inch thick when dry. Since it remains tough, flexible and resilient as it dries out, any tendency to contract, shrink and crack is minimized.

Mixed and applied as directed, Stic-Tite covers 45 sq. ft. per inch of thickness per 100 lbs. of material used.

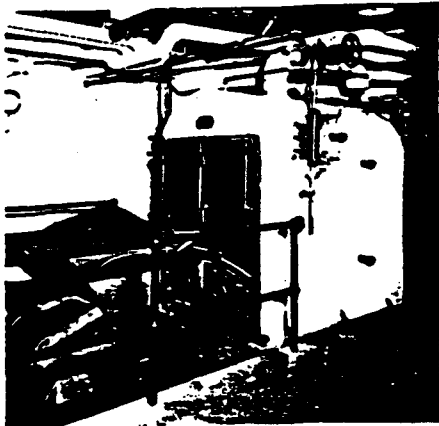
FULLY RECLAIMABLE

Stic-Tite need never be discarded, even when removed from equipment for repairs or alterations because it can be used over again without loss of material or insulating efficiency. Where previously used for temperatures up to 900°F., it is only necessary to crush and mix the old Stic-Tite with clean water and the cement is ready for remolding. Where used at higher temperatures, it is advisable to add an equal part of new Stic-Tite to the reclaimed material.

MORE ECONOMICAL

Because of Stic-Tite's ease of application on irregular surfaces, as well as large or small flat or curved surfaces or for patching other insulations, labor cost is relatively low. It sticks to hot or cold surfaces readily, hence the expense of supporting or reinforcing wires is eliminated in most cases, making a uniformly efficient covering that keeps heat losses at a minimum and assures maintenance of desired temperatures in the equipment insulated.

Stic-Tite is an indestructible investment. It is much lower in cost than insulating blankets or block.



Stoker-fired, industrial boiler insulated and smooth-finished with Stic-Tite.



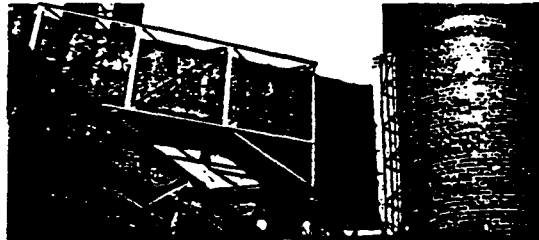
No matter how irregular the surface, as in this job, Stic-Tite is put on without reinforcement or expensive labor. Note how easily it can be roughed out to any desired thickness.



The same job with the same Stic-Tite mixture put over the dry roughing coat and smoothed off with a trowel. In the event of repairs, both roughing and finishing coats are reclaimed, without separation or loss.

PACKED CONVENIENTLY

Stic-Tite is shipped dry in heavy lined, dustless paper bags containing 25 lbs. and 50 lbs. each. It does not deteriorate in dry storage and can be kept indefinitely if damp or wet places are avoided.



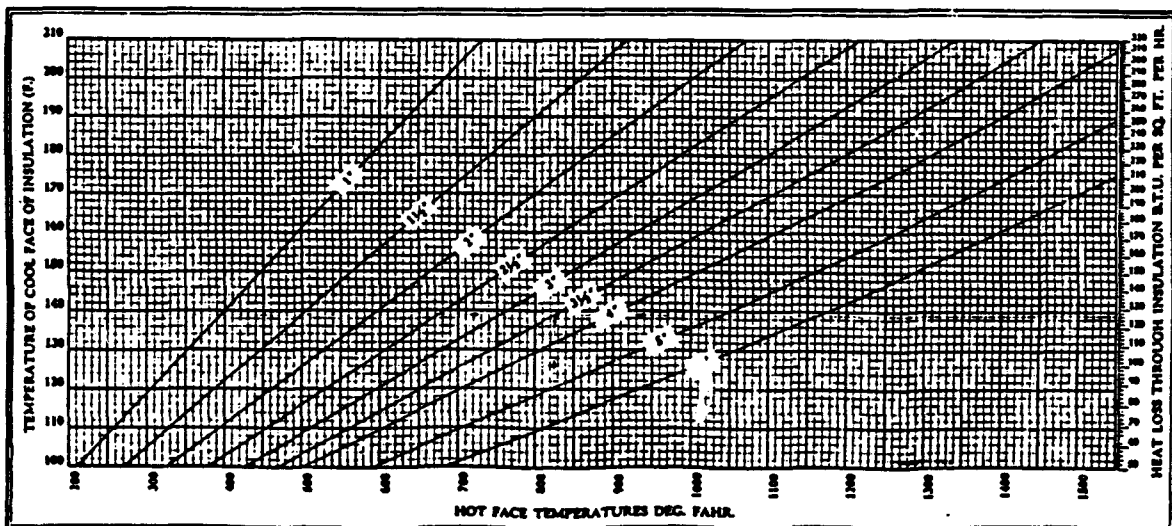
Stic-Tite applied over R & I Krackpruf Blanket Insulation on a large outside boiler stack breeching, 12 ft. x 10 ft. x 60 ft. long and protected with Weatherkote Cement.

HOW TO SELECT PROPER THICKNESS

Estimate the operating temperature of your installation, (hot face). Follow the hot face temperature (bottom of chart) vertically until it intersects the line connecting the cool face (left hand column) or B.t.u. loss (right hand column). Use the amount of Stic-Tite indicated on the Stic-Tite curve nearest the point of intersection.

For example, assume operating temperature is 825° F. and a cool

face of 139° or 126 B.t.u. loss is desired. Follow the 825° line vertically until it intersects the horizontal 139° and 126 B.t.u. loss lines. The intersection is nearest the 3½" Stic-Tite curve. Therefore, 3½" of Stic-Tite should be used. At the same operating temperature if a cool face of 121° or B.t.u. loss of 96 is desired, the intersection would be nearest the 5" Stic-Tite curve. Therefore, 5" of Stic-Tite should be used.

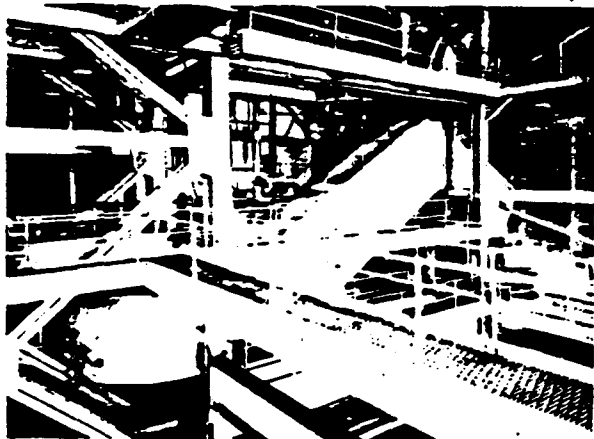




Stic-Tite troweled to a smooth, attractive finish on the casing of a large public utility boiler provides efficient, durable insulation and reduces air leakage to a minimum.



First rough application coat of Stic-Tite to an air pre-heater in a power plant.



Large primary air duct leading to pulverized coal furnace, covered with Stic-Tite over R & I Insulating Block.

HOW TO APPLY STIC-TITE

1. Each 50# bag of Stic-Tite should be mixed with 12 gallons (100 lbs.) of fresh water per 50# bag.
2. After thoroughly mixing, Stic-Tite Insulation Cement can be applied immediately, but better results can be obtained by allowing it to soak for at least half hour or longer.
3. All surfaces to be covered, should be free of paint, dust, dirt and grease.
4. Roughing coats can be applied by hand or trowel or combination of hand and trowel.
5. If hot surfaces are to be insulated with Stic-Tite, the material should be spotted in place with a trowel and dragged down to a feather edge. The spotted material will dry quickly and then a rough coat about 1" thick can be applied over and between the spots.
6. On cold surfaces for covering up to 1½" thick, after being mixed according to directions on the bag, Stic-Tite should be applied by spreading it over the surface to as even a thickness as possible. After rough coat has dried out, a finish coat up to ½" thick can be applied over the rough surface and finished with a trowel to a smooth, attractive finish. Stic-Tite can be used up to 1½" thick without reinforcing.
7. For covering over 1½" thick, apply a rough coat about 1" thick. When rough coat is dry apply another 1" coat and continue until desired thickness is obtained. Each coat should be dried before additional coats are applied. Prior to application of finish coat, we recommend reinforcing with #20 gauge 1" mesh chicken wire.
8. Finish coats should be applied from ¼" to ½" thick troweled to a smooth hard finish. Where desired, Stic-Tite finish can be painted. Best results are obtained by painting with a glue sizing and paint over this.
9. If more Stic-Tite is mixed than can be used, the left over material can be laid aside and remixed with water at a later date when it is required.

WHERE TO USE STIC-TITE

Air Heaters	Hot Air Ducts
Burner casings	Hot Air Lines
Boiler front, side and rear walls	Hot Piping
Breechings	Hot Water Heaters
Cookers	Kettles
Drum Heads	Reaction Vessels
Elbows	Regenerator Faces
Flanges	Steam Heaters
Feed Water Heaters	Steam Pumps
Furnace and Oven Doors, Walls, Floors, Roofs	Tanks
Gas Generators	Tube Doors
	Uptakes
	Valves and Fittings
	All Irregular Surfaces

CE0114062



HEAT INSULATING MATERIALS

SUPER-FINISH STIC-TITE

A One-Coat Finish Plastic Insulation

Smooth Finish • No Cracks

Very Adhesive

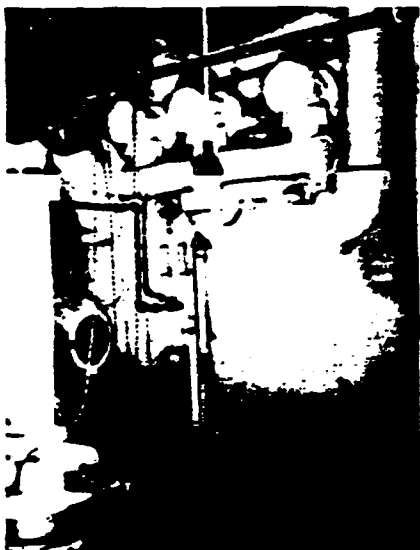
*Hard Surface Resistant
to Abrasion and Water*

Light • Efficient • Economical

R & I Super Finish Stic-Tite is a dry mixture of mineral wool and diatomaceous earth base forming a fibrous insulation that provides a strong, hard finish covering for insulating blankets, block and other insulating cements.



Bag of Super Finish Stic-Tite showing uniform, dry material (left) and easy to handle plastic after mixing with water. Packed in 25 lb. bags.



Condenser type heater, valves, flanges, etc. covered to a smooth, white surface with Super Finish Stic-Tite.

Because it is exceptionally adhesive, Super Finish Stic-Tite can easily be applied to full thickness over other insulations in one coat, finishing very smooth without need for supplementary pointing up or patching after the cement has dried out. Being a finish that can be troweled smooth in one coat, considerable time and labor are saved in eliminating the roughing coat.

Super Finish Stic-Tite has little or no shrinkage; hence it dries hard, without cracking, in about 2 hours. It can be applied directly to cold or warm metal or brick surfaces up to 175°F. When applied to hotter surfaces, a base coat of regular Stic-Tite is recommended.

Super Finish Stic-Tite truly sticks tight the moment the wet cement is troweled on, even on overhead surfaces, so that the workman can easily work the material to a smooth finish. And it stays on for keeps, bonding to the insulating blankets, block or other insulation surfaces permanently.

Its hard finish provides good resistance to moderate impact and abrasion and to moisture. Hence it is used extensively on outside equipment. For protection against weather, however, a covering of R & I Weatherkote is desirable. The surface of Super Finish Stic-Tite is well suited to painting.

Unlike ordinary insulation finishes, Super Finish Stic-Tite is light, weighing only 30 lbs. per cu. ft. It provides excellent insulation at temperatures up to 1700°F.

In material economy, it goes a long way. One hundred lbs. will cover an 80 sq. ft. surface $\frac{1}{2}$ " thick or 120 sq. ft. $\frac{3}{8}$ " thick or 160 sq. ft. $\frac{1}{4}$ " thick. This is considerably greater coverage at much lower overall cost than with any other durable one coat finish insulation available.

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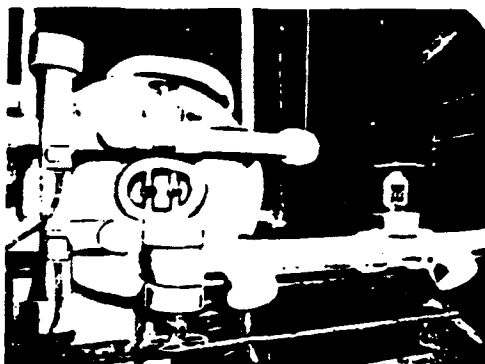
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Catalog No. I-29

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CE0114063



Drum head, piping, flanges, ella, valves, insulated with Stic-Tite and then troweled to a smooth, white, hard finish with Super Finish Stic-Tite.

HOW TO APPLY SUPER FINISH STIC-TITE

1. Mix Super Finish Stic-Tite thoroughly with 5 to 6 gals. fresh water per 25 lb. bag.
2. Allow the cement mix to soak for one-half hour before using to insure maximum workability.
3. Mix no more than will be applied in 4 hours.
4. If any of the batch has dried out, do not remix it with water or fresh, dry material as the resultant finish will not be hard. Use only fresh batches.
5. For smoothest finish, trowel the cement to at least $\frac{1}{8}$ " thickness.
6. Where used as a finish coat over an insulating cement roughing coat, be sure the undercoat has set overnight before applying Super Finish Stic-Tite.
7. Where a given area cannot be finished in a continuous application, the joints should be feathered.

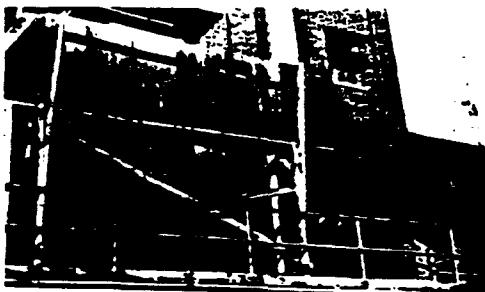
R & I WEATHERKOTE

A Protective Coating Over Insulation for Outdoors

Weatherproof • Waterproof • Resistant to Abrasion



These large insulated storage tanks are protected from the weather by R & I Weatherkote.



Chicken wire was stretched over a neat coat of R & I Weatherkote covering insulation on this large outside duct. To the right is seen an additional light coat of Weatherkote mixed with sharp sand, troweled to a smooth finish.

Weatherkote is a mixture of asphalt emulsion and long fibred asbestos of heavy plastic consistency for applying over the insulation of heating equipment exposed to the outdoors. Its elasticity prevents cracking even under extreme variations in temperature. It serves as an added means of insulation and for preventing air infiltration.

Weatherkote is easy to apply. The surface to be covered should be swept clean and free of loose particles. Then apply chicken wire directly over the insulated surface drawing it tightly to the insulation before applying Weatherkote.

Weatherkote should be mixed with 25% clean sharp sand and applied over the wire to a thickness of approximately $\frac{1}{4}$ " and troweled off smooth. Where a very smooth surface is desired, plain Weatherkote can then be lightly troweled over the material which has been mixed with sand for a very smooth finish.

For a coating which must be resistant to abrasion, hard use and even walking, Weatherkote can be mixed with one part by volume of clean sharp sand.

Applied plain, Weatherkote covers 50 sq. ft. approximately $\frac{1}{4}$ " thick per 100 lbs. Mixed with 25% clean sharp sand by volume, Weatherkote covers approximately 64 sq. ft. $\frac{1}{4}$ " thick per 100 lbs. Mixed one part clean sharp sand by volume with one part Weatherkote it covers approximately 75 sq. ft. $\frac{1}{4}$ " thick per 100 lbs.

Weatherkote is packed in steel drums containing:

- 5 gallons—approx. 50 lbs.
- 30 gallons—approx. 270 lbs.
- 55 gallons—approx. 500 lbs.

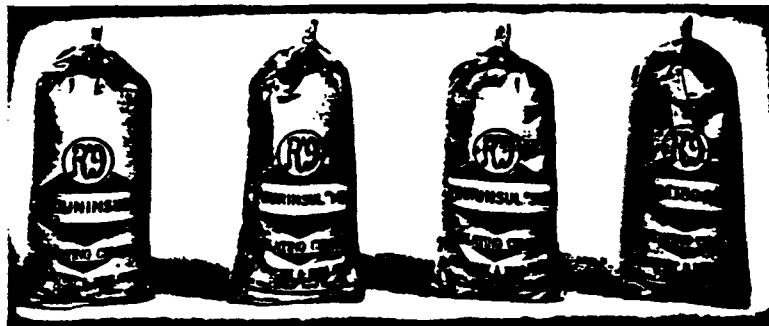
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HEAT INSULATING MATERIALS

INSULATING CEMENTS

**For Gunning,
Pouring or
Trowelling to
Insulate Open
Spaces and Prevent
Air Infiltration**



R & I GUNINSUL *Gunning Type of Insulation*

R & I Guninsul is a mixture of fibrous, medium and small granular insulating materials and proper binding materials, specially compounded to give it the right qualities for application by means of a pressure gun.

There are several advantages in shooting or gunning the cement on the hot surface of certain types of equipment such as regenerator faces, walls of open hearth furnaces, checker seal and other areas where both insulation and an ability to help prevent air infiltration are required.

By gunning the mix, the dry cement is mixed with water at the nozzle. Thus, preparatory mixing is not required. If necessary, this insulating cement can be applied by trowel.

Guninsul sticks tight to the surface against which it is shot. It builds up readily to the required thickness giving a monolithic coating that possesses an excellent insulating value as well as preventing air infiltration much better than the large granular materials commonly used.

R & I Guninsul is a structurally strong material after drying out and is durable at temperatures up to 1800 deg. F.

Where a smooth finish is desired, it may be troweled.

For outdoor work it can be weather-proofed with a coating of R & I Weatherkote Cement.

R & I Guninsul is packed in heavy lined paper bags containing 50 lbs. net.

R & I #1800 *Insulating and Refractory Cement*

R & I #1800 is an insulating cement with certain refractory qualities. It is manufactured of suitable

binder and both fibrous and small granular insulating and refractory materials. When mixed with water it can be easily troweled in place.

R & I #1800 is mixed with 10 to 12 gallons of clean, fresh water per 50 lb. of cement and may be used immediately after mixing, but more satisfactory results can be obtained if the material is allowed to temper for an hour or more.

A slightly refractory surface develops when troweled sufficiently, which provides resistance to temperature and abrasion. R & I #1800 can be used at temperatures up to 1800° F.

Weight 35 lbs. per cu. ft. installed.

Conductivity at 493.6° F.

mean—0.96 Btu/hr./sq.ft./deg. F./in.

Conductivity at 975.2° F.

mean—1.24 Btu/hr./sq.ft./deg. F./in.

Packed in 50 lb. triple-lined paper bags.

R & I POURINSUL

R & I Pourinsul is composed of mineral fibre and fine granular insulating materials combined with the proper binder to make it an ideal castable type of insulation.

It may be poured in place as an insulating backing for refractory material exposed to heat or between panels where it would be impossible to use insulating block.

While Pourinsul is not adhesive, it does provide an absolutely non-shrinking backing for refractory that does not separate where the two materials are joined. This is particularly true when Pourinsul is used with Moldit-A Refractory Cement.

It is air-setting and simply has to be mixed with fresh water and poured, molded or troweled in place. Pourinsul can be used over irregular surfaces where adhesive properties are not required, and it will dry without shrinking, into a block that conforms precisely to the irregular surface on which it is placed.

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There are two types of R & I Pourinsul: #14 and #36, data on which is given on the next page.

#14 Pourinsul

Density—44 lbs. per cu. ft. molded in place and dry.
Requires—25 qts. of fresh water per 50 lbs. of material for mixture.
Maximum temperature of service—1400° F.
Conductivity—1.1 B.T.U. at 467.8° F. mean temperature.
1.34 B.T.U. at 1093° F. mean temperature.

#36 Pourinsul

Density—36 lbs. per cu. ft. molded in place and dry.
Used where a lighter type of pouring insulation is preferred.
Requires 32 qts. of fresh water per 50 lbs. of material for good mixture.
Maximum temperature of service—1400° F.
Conductivity—0.86 B.T.U. at 298.7° F. mean temperature.
1.01 B.T.U. at 644.6° F. mean temperature.
1.25 B.T.U. at 1109.5° F. mean temperature.

DRY INSULATING FILLERS

Packing
and
Filling
Types



R & I LOOSE-FILL

For Pouring and Filling

R & I Loose Fill Insulation is composed of long and short fibres and fine granular material all having excellent insulating value. It is shipped in dry form and can be used dry as it comes from the bag at temperatures up to 1800° F.

Loose Fill is easy to pack in spaces which are inaccessible for other types of insulation and where this type of insulation is economically warranted.

Loose Fill Insulation fills and packs tightly into required places quite readily. It does not flow or sift through crevices or cracks.

Conductivity at 270° F. mean 0.61 Btu.

R & I Loose Fill Insulation is light in weight and easy to handle. Weight per cu. ft. is 17 lbs., packed in place. Packed in heavy paper bags containing 50 lbs.

R & I PAKINSUL

Granulated Mineral Fibre

R & I Pakinsul is a specially processed fibrous material that can be easily packed in place and used at temperatures up to 1200° F. It is especially useful in confined or relatively inaccessible spaces.

This light fibrous material not only has excellent heat resistance and insulating value, but withstands shock and vibration with little settling when properly packed. It will also allow for a certain amount of expansion.

Pakinsul can be packed to a density of approximately 14 lbs. per cu. ft. Supplied in bags containing 40 lbs.

R & I LOOSE WOOL

This is another form of R & I superior mineral wool insulation, light, soft, clean and downy. It does not break down, dust or settle; is fireproof, verminproof and moisture resistant. Useful and efficient up to 1200° F. This material is an ideal bulk filler insulation for furnaces, boilers, ovens and other equipment where blanket or block insulation cannot be conveniently applied.

R & I Loose Wool weighs approximately 10 lbs. per cu. ft. installed and is packed in sturdy paper bags containing 40 lbs. net.

SEMI-EXPANSION INSULATION

R & I Semi-Expansion Type Materials meet the demand for insulation which has adhesive qualities and still has resilience to take care of a certain amount of contraction and expansion.

These products have to be mixed with water for troweling or to be packed firmly in place. There are three grades with varying degrees of resilience and insulating properties.

Mix A in place weighs about 21 lbs. per cu. ft. and is recommended for use where strength is not important, but expansion and contraction of the equipment takes place. It is designed to fill such a space, compressing and expanding, as the equipment expands and contracts.

Mix B is recommended where slightly more strength is required and less resilience. It weighs about 24 lbs. per cu. ft.

Mix C has the greatest strength of the three and a minimum of resilience, weighing 27 lbs. per cu. ft.

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HEAT INSULATING MATERIALS

KRACK-PRUF INSULATION

*An Improved Method of Applying a Combination
Insulation to Withstand the Expansion and Contraction
of Hot Metal Surfaces without Cracking the Finish Cement*

for

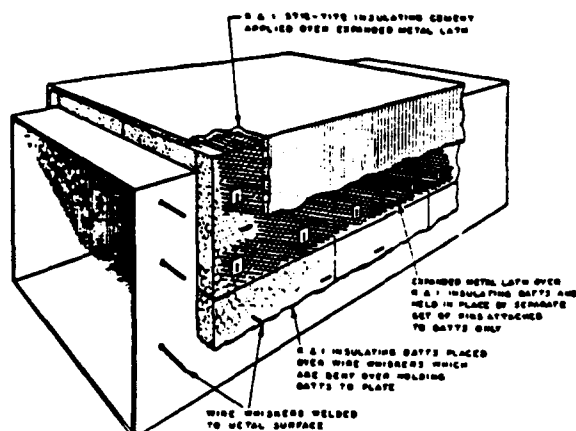
Ducts • Flues • Breechings
Tanks • Heaters • Boilers
Ovens • Furnaces

The insulating efficiency, mechanical strength, ease and low cost application of R & I Mineral Wool Blanket Insulation is well recognized. The need for covering this insulation with a monolithic finishing cement in order to provide a hard, smooth surface is likewise readily appreciated. But no matter how firmly the finishing cement adheres to the wire mesh of the insulating blanket or how resistant to mechanical stresses, the contraction and expansion of the hot metal surfaces causes the attached blankets to move which, in turn, cause the cement finish to crack.

R & I Krack-Pruf is designed to eliminate the checking and cracking of the cement finish over blanket type insulation. A separate set of whiskers which are attached to the blanket only to hold the 1.8 hexagonal wire to the outside surface are not attached to the metal surface that is being insulated. This does not allow expansion, contraction and any bulging of the insulated area to crack the cement finish which is always the case where the blankets are attached directly to the whiskers of the metal surface being insulated.

Krack-Pruf blankets themselves are furnished in batt form, 24" x 24", of any required thickness (from 1" to 6") with 20 gauge hexagonal mesh wire covering on both sides and edges. Each batt has four #8 gauge, soft annealed whiskers to hold the hexagonal wire for the cement finish. This makes one whisker through the batts for every sq. ft. of blanket surface.

These #8 wire whiskers have a quick nut on top of the blanket and another quick nut is furnished in



Sectional view of Krack-Pruf applied over duct.

order to attach the 1.8 expanded metal to the protruding whisker. This also gives a slight sliding surface for the 1.8 wire at the point of the whisker.

The 24" x 24" batt blanket is applied to the surface to be insulated by first spot welding #8 gauge wire whiskers to this surface, about 1 1/2" longer than the thickness of the insulation on 9" centers. The Krack-Pruf Batt Blanket is then impaled upon the #8 wire whiskers which are bent over tightly holding the Krack-Pruf Batt Blanket in place.

Next the 1.8 metal lath is applied over the Batt Blankets which gives a stiff flat surface for the application of the finish insulating cement. This allows the expanded metal to carry the finish cement and will not allow the metal walls of the casing or duct to affect the outside finish.

R & I Stic-Tite Insulating Cement which has advantages of adhesiveness, high insulating efficiency, strength and durability as well as ease of application, is recommended for the covering of Krack-Pruf.

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R & I ALUMINUM PAINT

***A High Reflective Paint for Asphalt Coatings,
Insulating Cement Surfaces, Primed Steel and Masonry***

- **Does Not Shrink or Corrode**
- **Resists Heat and Cold and Wet Weather**

R & I Aluminum Paint is an asphalt base finishing paint recommended for use over insulation which has been covered by an asphalt type weather-proofing such as R & I Weatherkote.

It forms a highly weather resistant, flexible film covering which, since it is readily compatible with bituminous coatings, bonds strongly to the Weatherkote.

It is also ideal for coating asphalt base roofs or primed steel, but is not recommended for use over wood.

R & I Aluminum Paint is a combination of selected asphalts, the finest grade aluminum flake, all physically and chemically combined to give a brilliant, durable decorative finish. It is factory mixed and ready to apply by spray or brush.

Recommended Uses—For protecting and brightening insulation exposed to the weather, R & I Aluminum Paint is ideal for use over Weatherkote, an insulation protective coating. For decorating purpose alone, R & I Aluminum Paint may be applied directly to the insulation.

R & I Aluminum Paint applied to steel increases its corrosion resistance. When applied to steel, the

surface must first be primed with red lead, zinc chromate or other inhibiting agent.

Due to its high reflectivity, R & I Aluminum Paint applied directly to a smooth surface or a granule-coated roof, or insulated surface, reduces the temperature inside buildings. By minimizing direct contact with the sun, wind and rain, it adds greatly to the life expectancy of the surface.

Coverage—As a rule, the smoother the surface to be painted, the less R & I Aluminum Paint will be required to cover a given area. Metal or asphalt surfaces require about 1 gallon per 300-500 sq. ft., while insulation, mineral surfaced roofing or masonry require 1 gal. per 150-350 sq. ft.

Application—Before applying Aluminum Paint, all surfaces must be thoroughly dry and free from dirt and dust. Asphalt coatings should dry for at least a week before being painted.

After thorough stirring, the paint may be sprayed or applied with a brush. Brush applications, however, require at least two coats in order to avoid weaknesses in the film due to brush marks.

Caution: R & I Aluminum Paint is inflammable before drying and should not be applied near open flames. When applying in closed areas and unventilated spaces, adequate draft should be provided.

Containers—5 gallons and 1 gallon.

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CE0114068



ELECTRICAL INSULATING MATERIALS

R & I CONDU-SEAL

**A Positive, Water-Proof, Gas Tight Seal Against
Fumes • Vapors • Gases • Salts of Soil Water**

**Prevents Seepage into Manholes
and Buildings
Resistant • Effective • Permanent**

As its name implies, R & I Condu-Seal provides a positive protective seal between conduits and cable against water, fumes; marsh, sewer and illuminating gas; and salts of soil water.

It has the consistency of stiff putty, is permanently plastic and is easy to handle.

Condu-Seal conforms to any surface by hand molding pressure without flowing or shrinking. It is clean, not sticky to the touch and non-corrosive.

Compared with the involved procedure of tar and oakum sealing, Condu-Seal protection requires only three simple steps.

1. Space evenly the individual conductors in the conduit with rope about 6" back of the conduit opening.

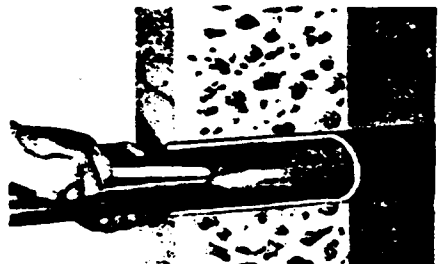
2. Next pack about 3" of oakum into the conduit (up to rope space). If bare "neutral" is employed, open the strands and squeeze in Condu-Seal to about 3" from the conduit opening. This prevents seepage through the neutral strands.

3. Fill up all remaining space in the conduit with Condu-Seal. Press firmly at first, but not hard enough to dislodge the oakum. Then, as filling progresses, pack in Condu-Seal hard to form a perfect air, gas and water-proof seal. Condu-Seal and conduit opening can be molded off neatly with the fingers.

R & I Condu-Seal is packed in paper containers of about 5 lbs. each, with ten rolls to the carton.



Inserting Rope Spacer.



Packing Condu-Seal In Place.



Cross-section of Finished Seal.

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R & I ARC RESISTING CEMENT

R & I Arc Resisting Cement is a refractory material that is used for fireproofing and to resist arcing of individual cables in manholes and conduits. It helps confine the fire to one cable and prevent burning of other cables. The cement is used as follows:

1. Paraffin tape is first wrapped around the cable to protect it against the free lime in the cement.

2. Over the paraffin tape, plain gauze is wrapped and Arc Resisting Cement is troweled between the folds.

The cement, when dry, weighs approximately 125 lbs. per cu. ft.

Direction for use are as follows:

For tamping, mix 100 lbs. of cement with 9 quarts of water.

For troweling or plastering, mix 100 lbs. of cement with 11 quarts of water.

For pouring, mix 100 lbs. of cement with 14 quarts of water.

R & I COIL CEMENT

For use in electric furnaces or in appliances where electric wires are wrapped around a smooth core with no separators. R & I Coil Cement is troweled or painted over and between the coils of wire, depending upon the size of the wires. For this purpose, the wires are usually wrapped with even spaces between each coil.

An application of Coil Cement acts as an effective insulator and prevents short circuiting of the wires.

R & I Coil Cement is packed in 20 lb. pails ready for use.

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