

REFRASIL®

High temperature industrial insulation

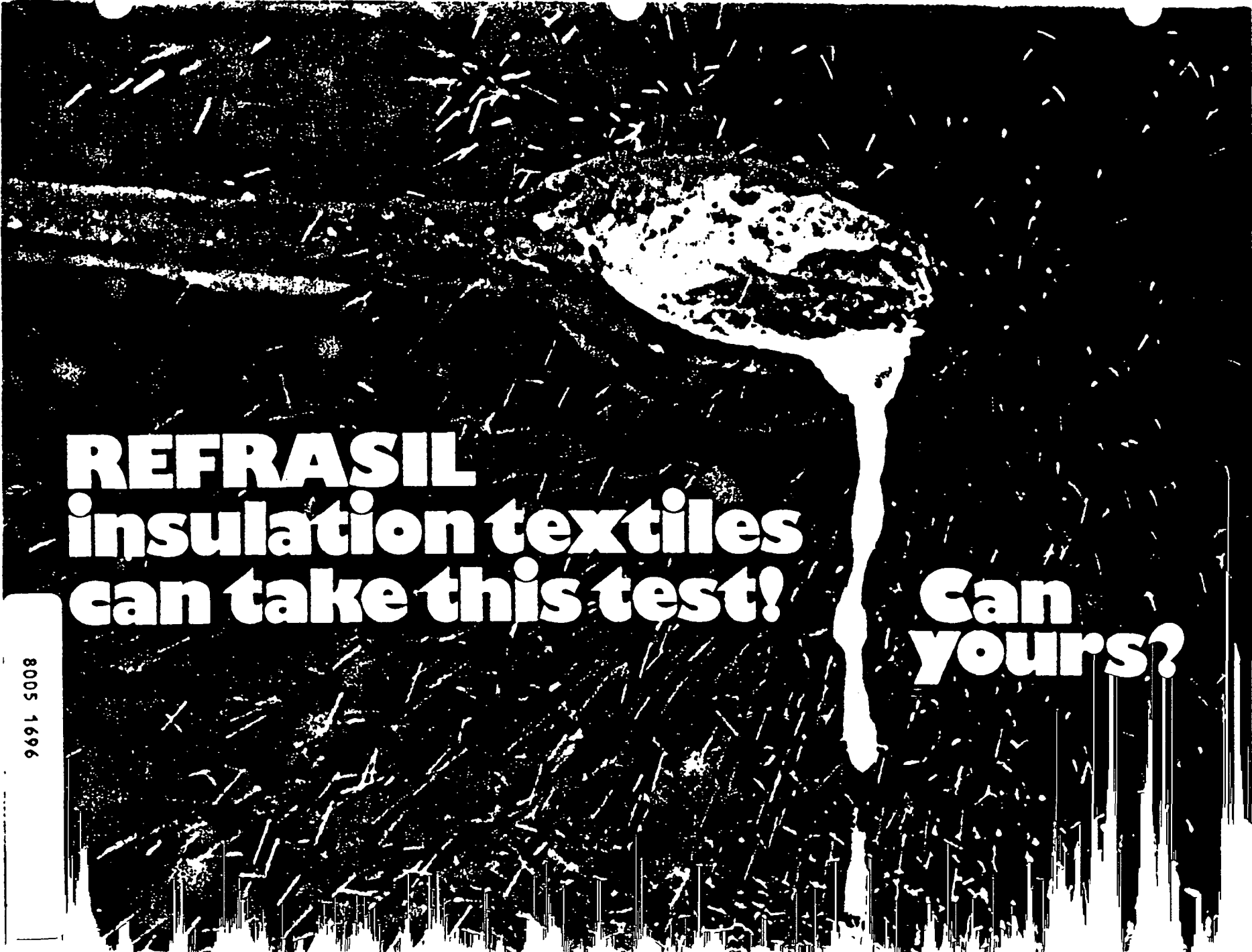


Materials Division **HITCO** • subsidiary of Armco Inc.



8005 1695 SCF-ALLF-00063

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**REFRASIL
insulation textiles
can take this test!**

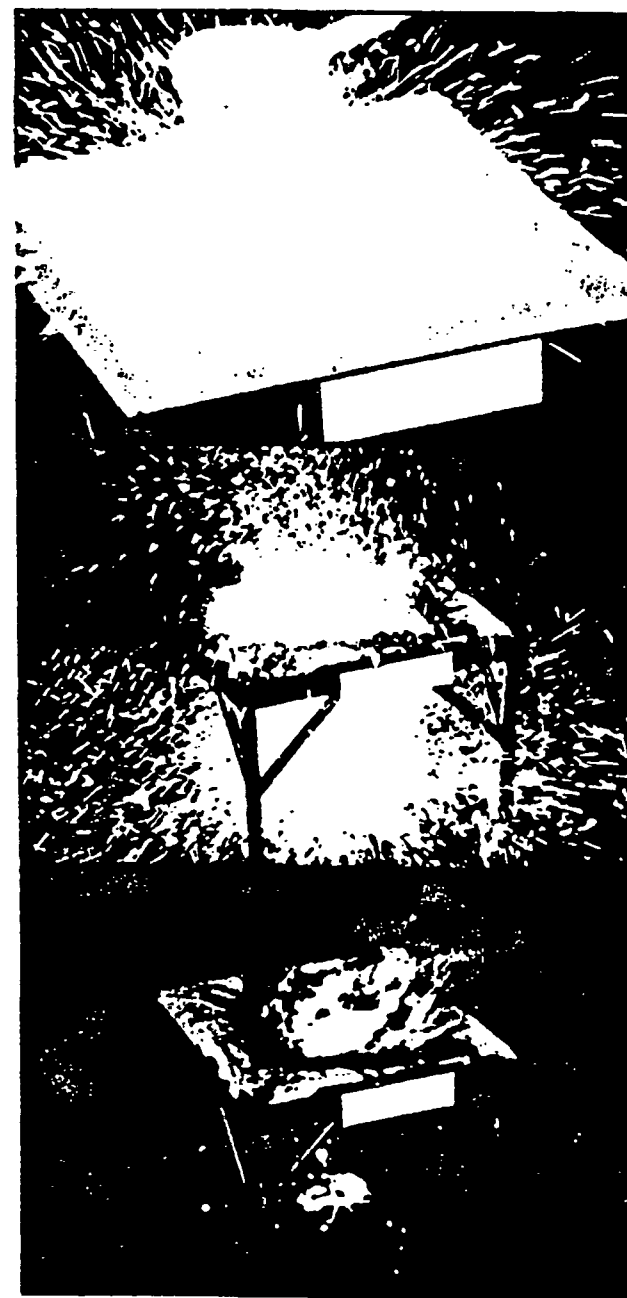
**Can
yours?**

8005 1696

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REFRASIL cloth (UC 100-96, .054" thick)



Asbestos cloth (Underwriter's Grade, .052" thick)

8005 1697

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REFRASIL insulation... a superior alternative to asbestos

This comparison of REFRASIL® industrial insulation cloth and Underwriter's Grade asbestos cloth clearly shows the superior high temperature performance of REFRASIL cloth.

Molten metal approaching 2800°F was poured on both materials. The asbestos was destroyed in seconds. But, even after three successive pours and cooling of the metal (last REFRASIL photo), REFRASIL resisted breakthrough.

In fact, REFRASIL insulation will provide thermal protection to 3100°F, although some embrittlement and shrinkage may occur beyond 1800°F. Up to 1800°F REFRASIL will insulate continuously and retain its strength and flexibility. A specially treated REFRASIL cloth called "Irish" retains strength and flexibility to 2300°F.

In addition to protecting at higher temperatures than asbestos and glass fiber products, REFRASIL exhibits minimal dusting and fly-off of fiber particles, is very low in chlorides and helps avoid the health hazards associated with asbestos.

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REFRASIL® trademark of HITCO
REFRASIL manufactured by HITCO, subsidiary of Armco Steel Corporation,
1600 W. 135th St., Gardena, CA 90249

Cloth

The standard UC 100 series cloth is the most popular form of REFRASIL textiles. It is available in 50 lineal yard long rolls, 36 inches wide in three thicknesses. It is also available as preshrunk cloth (C100 series) for applications where shrinkage cannot be tolerated. For improved abrasion resistance, durability and handling characteristics, it is available with a tough, sacrificial coating (2220 series).

Irish REFRASIL Cloth

"Irish" REFRASIL Cloth (treated with chromia from which it derives its greenish color and name) retains strength and flexibility to 2300°F and exhibits up to 10% lower thermal conductivity than other forms of REFRASIL. It is available in 50 lineal yard rolls, 33 inches wide in two thicknesses.

Slit tape

REFRASIL slit tapes are cut from Standard, Treated and "Irish" cloths and are available in 100 lineal feet rolls, 2 and 4 inches wide in two thicknesses. The Standard tape has an adhesive with release paper on one side to aid in installation. There is no adhesive on Treated or "Irish" tapes.

Woven tape

REFRASIL woven tapes have selvaged edges to prevent raveling. They are available as standard or pre-shrunk in 285 lineal feet rolls (265 feet for pre-shrunk), 1 and 1½-inch widths, all .015-inch thick.

Sleeving

REFRASIL sleeving is available as standard (.032-inch) or heavy (.065-inch) wall. Five nominal diameter sizes available in each. The looser weave of standard sleeving can accommodate a larger variety of diameters to about 3.30 inches. Heavy wall sleeving has a very tight weave for maximum thermal protection and can accommodate diameters to 1.6 inches. Both are available in 50 lineal feet rolls.

Yarn & Cordage

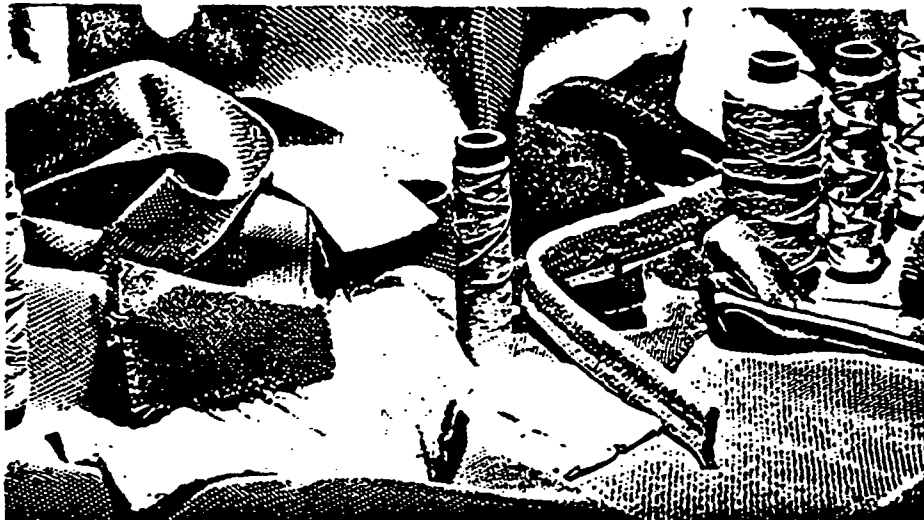
All REFRASIL yarn and cordage is pre-shrunk and is coated for improved handling and abrasion resistance. Yarn is available on 4½-inch braider spools, ¼-pound per spool. Cordage is available on either the 4½-inch braider tube or 3" x 10" cores.

Bulk fiber

Bulk fiber—chopped REFRASIL yarn in ¼-inch lengths—is available in Standard or "Irish" treated fibers. They are pre-shrunk and are packaged in 25-pound cartons.

Batt

Standard batt is comprised of loose felted, self-bonded, random interlocking fibers with no binders. It is packaged two blankets of 48 square feet each to a box. Nominal blanket size is ½" x 40" x 174".



Where can you use REFRASIL?

REFRASIL has been used successfully to shield and protect hydraulic lines, motor leads, hoses, water-cooled pipes and machinery from extreme radiant heat and molten metal splash. REFRASIL textiles have also been used successfully as insulating blankets in heat-treating and high temperature processing operations as refractory lining, aluminum pot line hood skirts, flexible expansion joints, furnace curtains, flue sleeves and numerous other electrical and thermal insulation applications. As

a weld protection or pre-heat cloth, REFRASIL guards equipment and finishes against damage from sparks and weld deposits, thus improving total welding performance.

For more information

These are just a few. New applications are continually being discovered. REFRASIL insulation can cut maintenance time and costs, reduce energy consumption and help protect parts, materials, men and machinery from potential damage caused by extreme heat.

Send for a free REFRASIL sample or contact your local REFRASIL distributor:

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REFRASIL®

Refractory silica in textile form

INSULATION

APPLICATION
BULLETIN
R-1

REFRASIL tape curtains on brazing furnace save up to 1/3 on natural gas requirements



Photo of the silver brazing furnace at Aeronutronic Ford Corporation in Connersville, Indiana, shows automotive parts exiting. The REFRASIL tape curtains perform in temperatures of 1400-2000° F.

By installing twin REFRASIL tape curtains at entrance and exit ends of three Sunbeam brazing furnaces, Aeronutronic Ford Corporation's Refrigeration Products Division reduced total natural gas requirements for the furnaces approximately one-third. The curtains serve both as a combustion chamber to burn off escaping gases and as a barrier to further escaping gases. Each curtain is made of six double rows of 17-inch-long, 1-inch-wide REFRASIL tape material.

The REFRASIL tape curtains used by Aeronutronic Ford perform in a temperature estimated to be 1400-2000° F. In this application, the curtains last an average of one week.

"That is a good service life," Howard Bowers, Maintenance General Foreman for the Connersville plant, says. "It's the best product for the application we could find and we've evaluated a number of other materials. Asbestos curtains, for example, have been tried, but they soon burn to a powder. This then flakes on the parts going through the line, contaminating them. Service life for asbestos curtains is two days. We also tried a glass fiber filament tape, but it too would flake and contaminate the products going through the line. Its service life was less than one 8-hour shift. A metal foil tape was tried, but it rapidly deteriorated in the high temperatures it was exposed to."

The brazing lines at Aeronutronic Ford are used in sub-assemblies of automotive air-conditioning components. The hydrogen-copper brazing line, for example, treats accumulators, receiver/dryers, and hose fittings. Another furnace is used for nitrogen vacuum brazing of evaporators. The furnaces run 24 hours a day.

"The natural gas savings are very significant to us," Bowers says. "We found the REFRASIL tape was a little more expensive than asbestos and filament tape, but its added service life coupled with the natural gas savings make it very attractive to us."

REFRASIL textile is an amorphous silica in a continuous filament fiber. It stands up in continuous use at temperatures to 1800° F with little or no change in properties and will not melt or vaporize until temperatures exceed 3100 F. REFRASIL products are available as fabric, yarn, cordage, bulk fiber, sleeving and batt.

For information, write HITCO, 1600 W. 135th St., Gardena, California 90249. Telephone (213) 321-8080.

REFRASIL® trademark of HITCO
Armco and the Armco Triangle® trademarks of Armco Steel Corporation
Middletown, Ohio



Litho in U.S.A.

LHT/MD-675 (Repr. of LHT/MD-274) SM CP 6-75

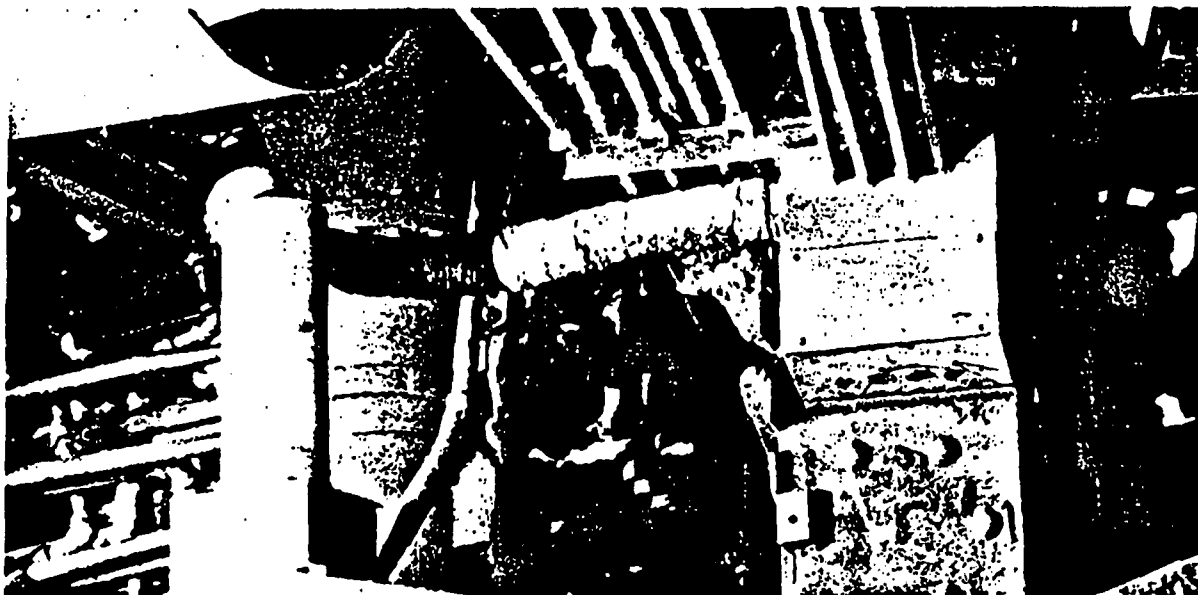
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REFRASIL® Refractory silica in textile form INSULATION

APPLICATION
BULLETIN
R-2/3



REFRASIL tape helps cut blast furnace maintenance costs

At the blast furnace in Armco's Ashland, Kentucky Works, the power lead for the mud gun, insulated with asbestos wrapping, had to be replaced every 7 to 8 weeks. High temperatures and flexing were the culprits.

The same lead wrapped with a single layer of REFRASIL tape, has lasted 6 months already without failure. True, the REFRASIL costs about five times as much as asbestos, but based on other savings it makes possible, this is insignificant.

Savings mount

Each new power lead costs about \$200. For every REFRASIL wrapped lead, more than nine asbestos-wrapped leads could be required.

If a lead is replaced when not in action, it takes one man to replace it at a cost of about \$12.50 per hour for two hours. But if, as is more often the case, it fails in use, it becomes much more costly. It takes about 3 man-hours for 6 men to finish sealing the blast furnace taphole. This added half hour is delay time for the furnace at a cost of over \$850 per hour. Plugging the taphole when a failed lead puts the mud gun out of commission, is a very unpopular job. Six

men, in teams of two, must take turns going to the taphole with mud and scrambling back to escape the heat. Another good reason for cutting way back on the number of times it's necessary.

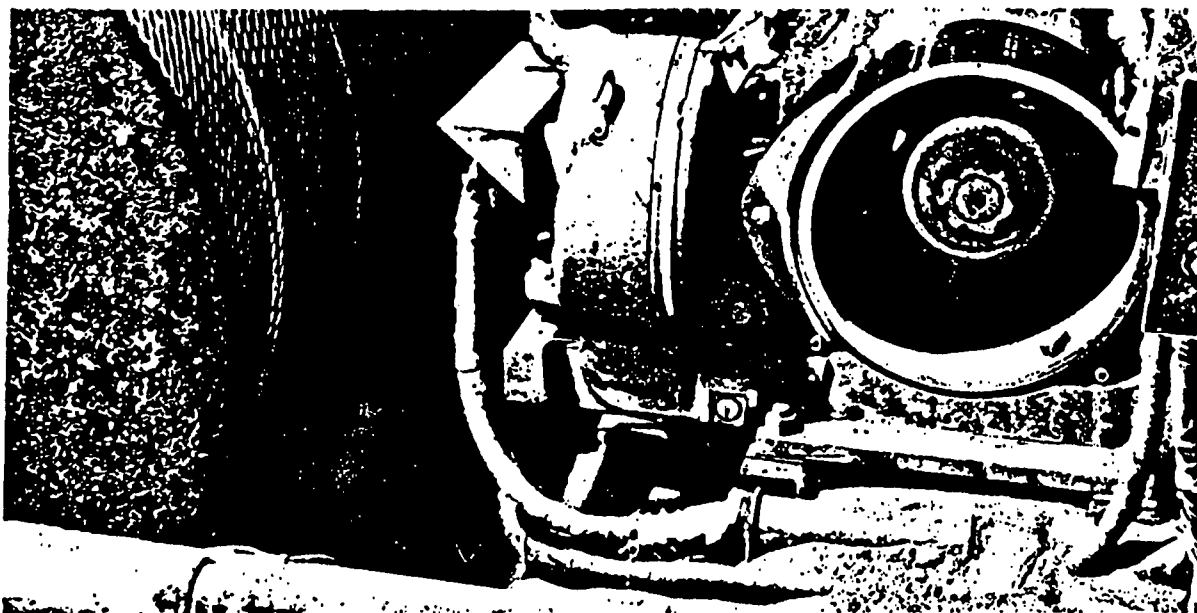
A typical job for REFRASIL tape

REFRASIL tape is one of the forms of REFRASIL textiles. It's a refractory textile prepared by chemically converting glass textiles. It continues to serve at temperatures where glass, asbestos and other textiles fail. It contains no binders or finishes, but can be provided with various coatings for improved abrasion resistance and ease of installation.

This outstanding thermal insulation will operate continuously at temperatures to 1800 F with little or no change in properties and does not melt or vaporize until temperatures exceed 3100 F. The same benefits that make it ideal for mud gun motor lead insulation make it a good choice in many other applications where heat is a maintenance headache. It's well worth looking at for those jobs in your plant.

8005 1701

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Read how REFRASIL tape cuts melt shop costs

Over 800 F environment

Wrapped with REFRASIL tape, motor leads on an overhead crane are protected from heat well over 800 F and flames at the Basic Oxygen Shop of the Ashland Works of Armco Inc.

The 240-ton crane is utilized to charge the furnaces and to move the ladle filled with molten slag when furnaces are tapped.

Old problem

A longtime problem has been vulnerability of the crane electrical lead from the limit switch to the motor itself. This lead supplies power to the motor that operates the lifting movement of the crane.

The electrical lead is subject to radiant heat from the BOM vessel and to direct flame and smoke when charging. When the furnace is charged the molten pig iron is 2400-2500 F. The lead, directly above where the pig iron is poured, is subject to a temperature estimated at 800 F.

Mill practice has been to replace leads and wrap them with asbestos about every three weeks. When heat degraded the asbestos, the lead itself would burn,

causing the motor to shut down. When the electric motor lead failed, it required a maintenance team 9 man-hours at a cost of \$12.50 per man-hour about three hours to replace the lead and rewrap it. This "delay time" costs over \$850 per hour in lost production.

New solution, big savings

During engineering evaluation the same crane motor lead was wrapped with two layers of REFRASIL tape. Although the cost of REFRASIL tape was 5 to 6 times that of the asbestos wrap, the REFRASIL wrapped lead has now been in service over 9 months and is still in good condition. Eliminating "delay time" every 3 weeks has resulted in a saving of more than \$12,000.

REFRASIL textile is an amorphous silica in a continuous filament fiber. It stands up in continuous use at temperatures to 1800 F when initial devitrification begins but will not melt or vaporize until temperatures exceed 3100 F.

For information, write HITCO Materials Division, 1600 W. 135th St., Gardena, California 90249. Telephone (213) 321-8080.

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REFRASIL • trademark of HITCO.



REFRASIL[®]

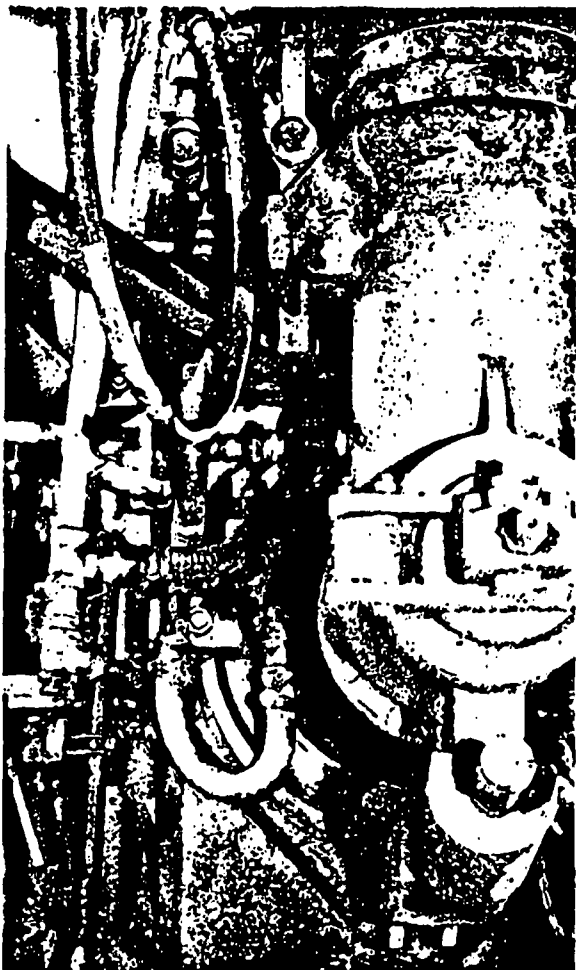
Refractory silica in textile form

INSULATION

APPLICATION
BULLETIN
R-4

Materials
Division of
HITCO
Subsidiary of
Armco Steel
Corporation

REFRASIL[®]-insulated tuyere hose
cuts blast furnace delay time



At the Ashland Works of Armco Steel, cooling water to relieve heat stresses and extend life of blast furnace tuyeres flows through 1¼-inch flexible hoses. For hoses on tuyeres located over the iron and slag notches, special insulating protection is a must because of extreme heat and actual splashing of molten metal and slag.

Hose protected with REFRASIL insulation promises 6-months life in service above the slag notch. Because of conditions, maintenance people had tried carbon steel pipe instead of hoses. Pipe was replaced when tuyeres were changed. However, at installation, tuyere and the solid pipe had to be perfectly aligned—an exacting job that stretched furnace delay time to 2 hours at over \$850 per delay hour. In addition, this required a maintenance team at \$25.00 per hour.

REFRASIL-insulated hose—installed by one man in 15 minutes

Flexible hose can be installed in 15 minutes. Even after 6-months' service, the REFRASIL-insulated hose is covered with splashes of slag, but hasn't leaked.

REFRASIL textiles do more

REFRASIL insulation is a refractory textile prepared by chemically converting glass textiles. It continues to serve at temperatures where glass, asbestos and many other textiles fail. It contains no binders or finishes, but can be provided with various coatings for improved abrasion resistance and ease of installation.

This outstanding thermal insulation will operate continuously at temperatures to 1800 F with little or no change in properties and does not melt or vaporize until temperatures exceed 3100 F. The same benefits that make it ideal for tuyere hose insulation make it a good choice in many other applications where heat causes expensive problems.

For information, write HITCO, 1600 W. 135th St., Gardena, California 90249. Telephone (213) 321-8080.

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REFRASIL [®] trademark of HITCO.

LMT/MD-674 2 SM CP 2-75



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REFRASIL®

Refractory silica in textile form

INSULATION

APPLICATION
BULLETIN
R-9

ITCO



REFRASIL cloth protects welder and surrounding equipment from weld spatter.

REFRASIL outperforms asbestos, glass fiber textiles in welding applications

Adaptable REFRASIL cloth has found growing use in various welding operations across the country because of its excellent performance under extreme high temperatures and its outstanding characteristics as an insulator. It has been used in welding and cutting operations as weld pre-heat and stress-relieving blankets, weld protection utility cloths and weld station curtains and shields to protect personnel and adjacent components during fabrication, repair and assembly.

Recommended in U.S. Navy Shipyard Operations

The United States Navy now specifies REFRASIL cloth as a substitute for asbestos welding blankets and cutting/burning safety shields in accordance with its Asbestos Replacement Program. REFRASIL not only outperforms asbestos in welding operations, but also eliminates the health hazards associated with asbestos.

The Navy's Asbestos Replacement Program is in effect at all Naval shipyards and repair facilities, and at some commercial shipyards with Navy contracts.

REFRASIL also meets the U.S. Coast Guard re-

quirements of 49 CFR 164.009 "Incombustible Materials," and Military Specification MIL-I-24244 "Insulation Materials, Thermal, with Special Corrosion and Chloride Requirements."

Insulation blankets

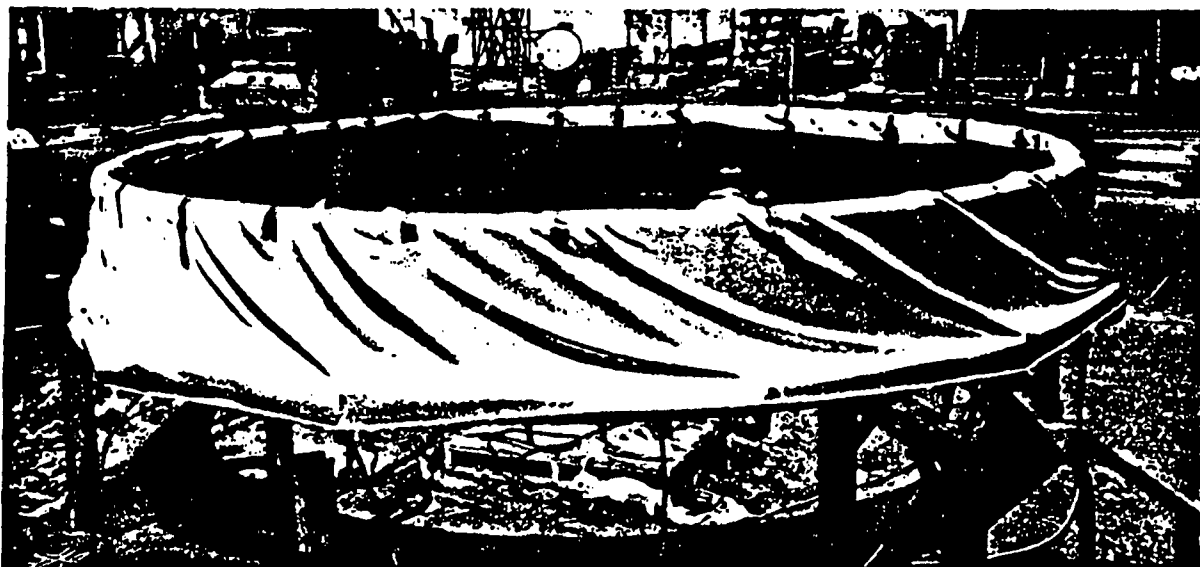
REFRASIL has been used effectively as an insulation blanket to retain and control heat in metal parts prior to welding, and to control the cooling rate of welded parts. It also is used as a stress-relieving blanket in post-weld heat treating operations. In the above applications, REFRASIL fabric is often combined with batt to increase insulating ability or a metal mesh for additional protection. REFRASIL UC100-48 and UC-100-96 most often is used in these cases.

Curtains or shields

REFRASIL 2220-96 and 2220-48 have found wide use as curtains or shields protecting personnel and equipment from weld spatter, and as a heat shield. REFRASIL curtains and shields normally are hung vertically to surround the entire welding area. Grommets may be installed to facilitate hanging.

8005 1704

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REFRASIL cloth draped over large steel component to help retain weld pre-heat temperatures.

Utility cloth

Many other firms use REFRASIL 2220-96 as a utility cloth, draping it over equipment for protection against spatter created by welding, cutting, gouging and similar operations where liquid metal or flux is created. REFRASIL is supplied in 50-foot rolls so users can cut lengths as desired, or the 2220-series can be ordered in specific sizes with sewn edges.

Product guidelines

Because of the great variety of REFRASIL applications in welding and cutting operations, it is recommended that these guidelines be followed:

- UC100-96 Cloth: An all-purpose cloth recommended for both welding and cutting operations. The heaviest cloth in the REFRASIL series, it provides optimum protection from deposits of molten metal, and may be used in stress-relieving and pre-heat applications where added insulation is required.
- 2220-96 Cloth: The same weight as UC100-96, but treated with a tough, sacrificial coating to improve abrasion resistance and durability. Recommended for use in outdoor areas, or anyplace where damage from abrasion, weather and general abuse may occur. Due to its coating, it is not recommended for stress-relieving and weld pre-heat applications.
- UC100-48 Cloth: A lightweight fabric recommended for use in light welding applications as a protection

against weld sparks and light weld spatter. Because it does not have sufficient thickness to dissipate heat from molten metal deposits without causing localized divitrification and heat penetration, it should not be used in operations where full protection from molten metal is required. It is useful in stress-relieving operations as an electrical and thermal insulator.

- 2220-48 Cloth: The same as UC100-48, but with a tough sacrificial coating to improve its durability. Useful in light welding operations where protection from sparks is needed, but is not recommended for stress-relieving or weld pre-heat applications because of the sacrificial coating.

Many other uses

REFRASIL is an amorphous silica fabric manufactured by the Materials Division of HITCO, a subsidiary of Armco Steel Corporation. It retains its strength at temperatures up to 1800°F, and does not melt or vaporize until temperatures exceed 3100°F, enabling it to serve in conditions where asbestos, glass and other textiles often fail.

Its excellent thermal characteristics make REFRASIL the best choice in many situations where a dependable heat-resistant shield is needed. For more information, write Materials Division of HITCO, 1600 West 135th Street, Gardena, California 90249.

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REFRASIL® is a trademark of HITCO



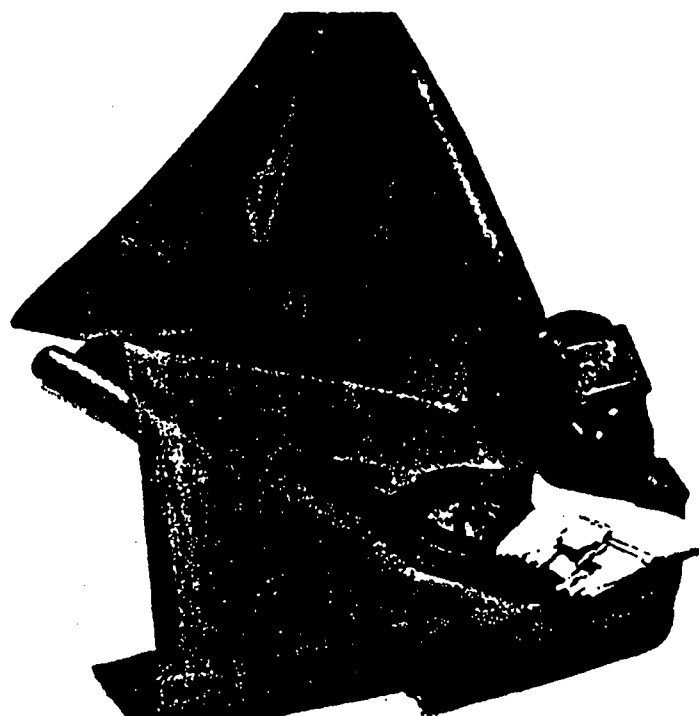
REFRASIL®

Refractory silica in textile form

INSULATION

PRODUCT DATA
BULLETIN
AR100 SERIES
CLOTH

W. L. GORDON & SONS
INC.
Pittsburgh, Pa.
15201



Special orange treatment to new AR Series REFRASIL Cloth improves abrasion resistance about 16 times.

New AR100 Series REFRASIL Cloth demonstrates improved abrasion resistance and strength.

Like UC Series REFRASIL, new AR100 REFRASIL Cloth protects to 3100 F, stays flexible to 1800 F, is fireproof, and is inert to most corrosive inorganic and organic chemicals. But a special protective coating makes it about 16 times more abrasion resistant than standard REFRASIL cloth.

AR Series REFRASIL is designed for intermittent and localized exposure to high temperatures. The standard product, pre-shrunk, and other specially treated versions of REFRASIL are recommended for constant exposures to elevated temperatures as in furnaces, ovens and kilns.

The AR Series REFRASIL is recommended for welding protection because the coating resists minor damage from dragging, scraping, tearing and snagging. But the coating does even more. It gives AR100 REFRASIL twice the break strength and 50% improved seam strength over the standard REFRASIL product.

Coating performance

The coating compound on AR Series REFRASIL is

colored orange to help you distinguish the abrasion resistant product from regular REFRASIL.

The treatment protects the REFRASIL fabric at ambient, handling temperatures. The coating itself begins degrading above 350 F with the degree of sacrifice determined by time and temperature.

Loss of coating from exposure to high temperatures affects only the abrasion resistance of the fabric, not its thermal performance.

Applications

AR Series REFRASIL is intended primarily as utility cloth to replace asbestos and glass fiber textiles. It's both tougher and more durable for longer service life. Its excellent abrasion resistance and ability to take extensive shop abuse make AR100 REFRASIL ideal for a variety of industrial uses.

This new product exhibits superior fabrication characteristics for such products as welding blankets, screens and curtains; stress relieving blankets and pads; or any sewn product where seam strength and ease of fabrication are factors.

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Health data

Tests show that products of combustion emissions from the new AR Series coating are safe and non-toxic. This assures you of another reliable REFRASIL product free from any known health hazards.

For specific details, refer to "Technical Data Bulletin, Safety & Health Considerations," LHT/MD-10979 for AR100 Series REFRASIL.

Availability

Orange-colored AR Series REFRASIL Cloth is available in two weights or thicknesses: AR100-48



New AR Series REFRASIL extends service life for applications with intermittent, localized exposure to high temperatures.

(20 oz./yd.²) or AR100-96 (40 oz./yd.²) The AR100 Series cloths are produced in 50 lineal yard rolls, 36 inches wide and are available through a nationwide network of stocking distributors.

For further details or the name of your nearest REFRASIL distributor, call or write:

HITCO Materials Division
Subsidiary of Armco
1600 West 135th Street
Gardena, CA 90249
Phone 213/321-8080

Cloth properties

	AR100-48	UC100-48	AR100-96	UC100-96
Break strength (lbs./in.)				
Warp	200	80	400	220
Fill	150	60	375	160
Tear strength (lbs.)				
Warp	10	N/A	18	N/A
Fill	5	N/A	14	N/A
Weight (oz./yd. ²)	20.3	18.5	40	35
Thickness (in.)	0.033	0.026	0.060	0.054
Flammability—warp/fill	nil	nil	nil	nil
Abrasion resistance (cycles)*				
Warp	2000	104	6500	229
Fill	175	55	3400	228
% Si O ₂ (min.)	96	96	96	96

*NOTE: Comparative abrasion values for AR Series and UC Series REFRASIL were developed according to Federal Test Method Standard 191, Method 5304, using 2-lb. load, 2-lb. tension, and 600 grit abrasive paper, tested to failure.

The information and data in this product data bulletin are accurate to the best of our knowledge and belief, but are intended for general information only. Applications suggested for the materials are described only to help the reader make his own evaluation and decision, and are neither guarantees nor to be construed as express or implied warranties of suitability for these or other applications, or recommendation to use the product in the infringement of any patent.



HITCO Materials Division

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HITCO and REFRASIL ® trademarks of HITCO.

REFRASIL®

Refractory silica in textile form

INSULATION

PRODUCT DATA
BULLETIN
CLOTH

5

REFRASIL UC100 Series cloth resists heat, flame, molten metal splash

REFRASIL cloth is a flexible refractory textile material with excellent insulation characteristics for high-temperature applications.

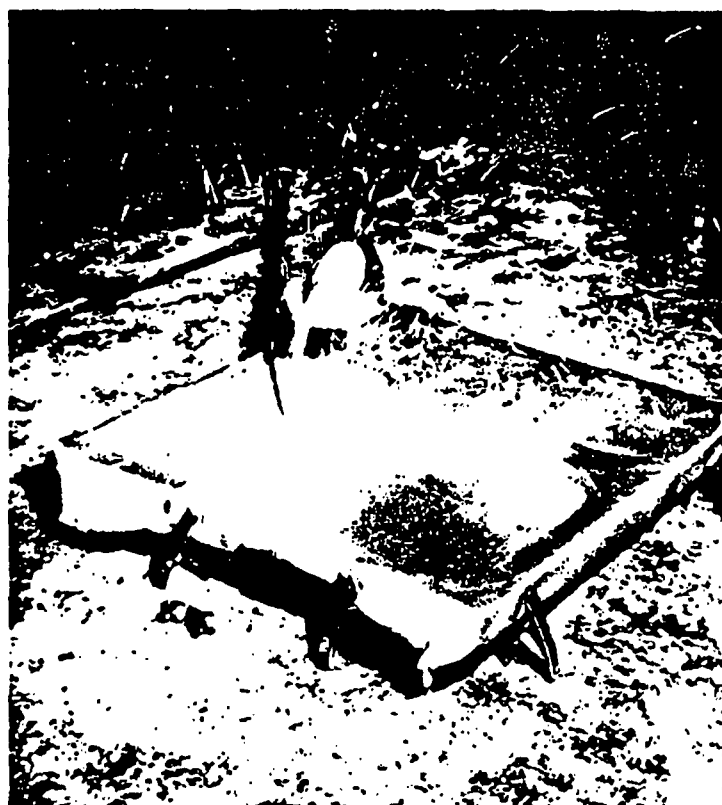
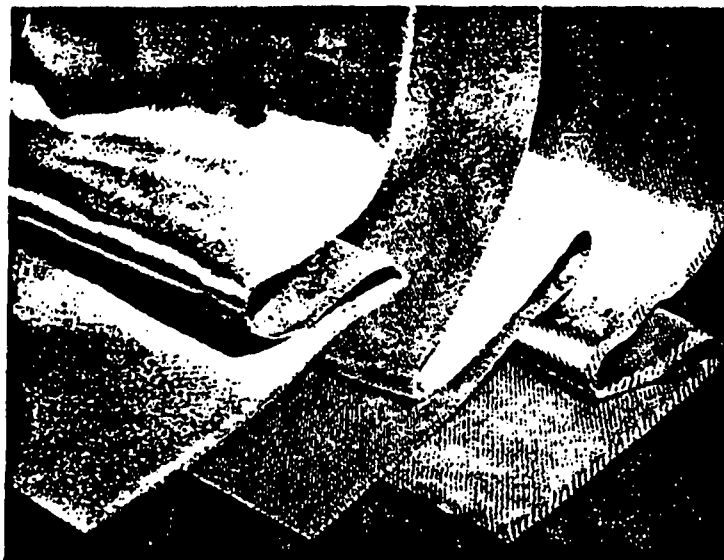
REFRASIL textiles are continuous filament, amorphous silica products, with the thermal performance of a refractory material. The fiber does not melt or vaporize until temperatures exceed 3100°F (1704°C). REFRASIL textile cloth will operate continuously at temperatures to 1800°F (982°C) with little or no change in properties. When temperatures are elevated beyond 1800°F (982°C) some embrittlement occurs. However, REFRASIL cloth continues to provide thermal protection to temperatures of 3100°F (1704°C).

REFRASIL textiles have excellent resistance to thermal shock as well as minimal shrinkage at service temperatures. It is inert to most corrosive inorganic and organic chemicals. It can withstand molten metal splash at 2900°F (1593°C).

2220 REFRASIL textile cloth is treated with a sacrificial, tough coating that improves the abrasive resistance, durability, and handling of the material. It facilitates fabrication by conventional methods of stitching, sewing, grommeling, etc.

Cloth Benefits

REFRASIL cloth is the most popular form of REFRASIL textile, providing excellent thermal protection against extreme high temperatures caused by



REFRASIL insulation withstands molten steel at 2800° F.

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Armco and the Armco Triangle ® trademarks of Armco Steel Corporation, Middletown, Ohio

8005 1708

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radiant heat, flame impingement and direct molten metal exposure. Reduced heat loss means lower fuel consumption and overall energy conservation. REFRASIL textile cloth has a high capacity to absorb moisture but does not degrade in the presence of water.

2220 REFRASIL textile fabric is a "treated" form of UC100 Series material. This treatment has been developed to enhance fabrication and improve abrasion resistance while maintaining the thermal insulation characteristics of the product.

Uses for Cloth

REFRASIL textile insulation offers a variety of applications such as furnace curtains, welding protection cloth, personnel shields, pre-heat and weld

stress relieving thermal blankets, and many other applications where heat is a destroyer.

2220 REFRASIL treated fabric is used as weld protection cloth and curtains, equipment covers, heat and flame shields, where textile fabrication methods are required. The durability of 2220 REFRASIL cloth enhances its resistance to physical abuse and abrasion, as well as improving its fabricating qualities.

For further details call or write:

Materials Division of HITCO
a subsidiary of Armco Steel Corporation
1600 West 135th Street
Gardena, California 90249
(213) 321-8080

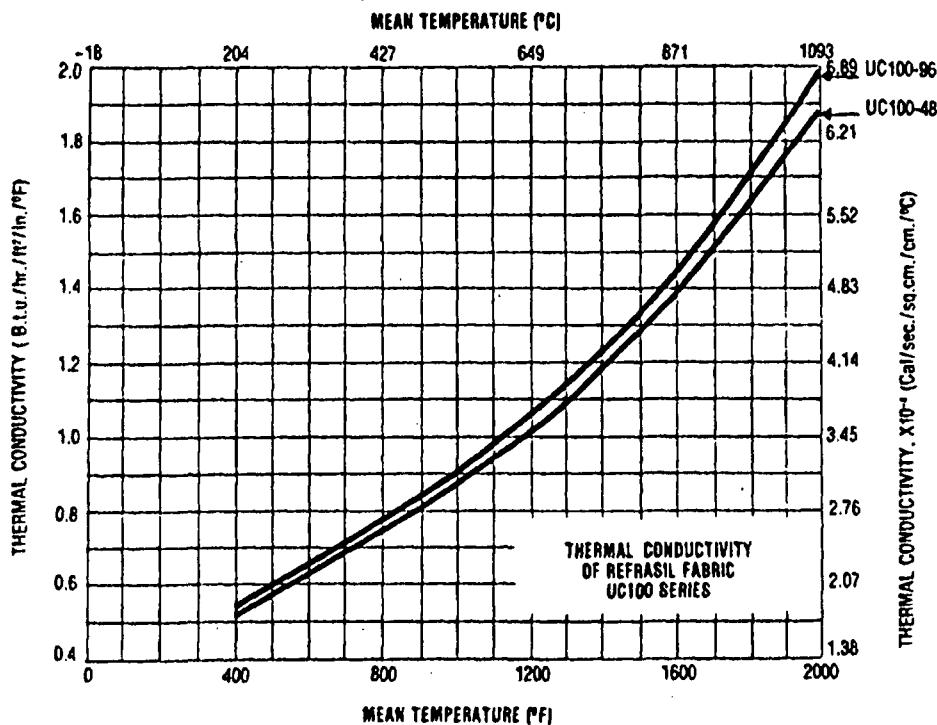
Properties of UC100 Series REFRASIL Cloth

Code No.	Type of Weave	Nominal Thickness (in.)	Nominal Width (in.)	Nominal Weight (oz./yd ²)	Nominal Breaking Strength (lb./in.)		Thread Count Per Inch*	
					Warp	Fill	Warp	Fill
UC-100-28	Harness	.015	36	10	60	40	65	58
UC-100-48	Harness	.026	36	18	80	60	46	36
UC-100-96	Harness	.054	37	34	220	160	46	36
2220-48	Harness	.027	36	21	80	60	46	36
2220-96	Harness	.055	37	38	220	160	46	36

* ± 4 ends and 4 picks per inch

All REFRASIL textile cloth material is supplied in 50 yard rolls.

Thermal Conductivity Curves for REFRASIL Cloth



LHT MD-1275 5M CP 1-76



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3

UTCO

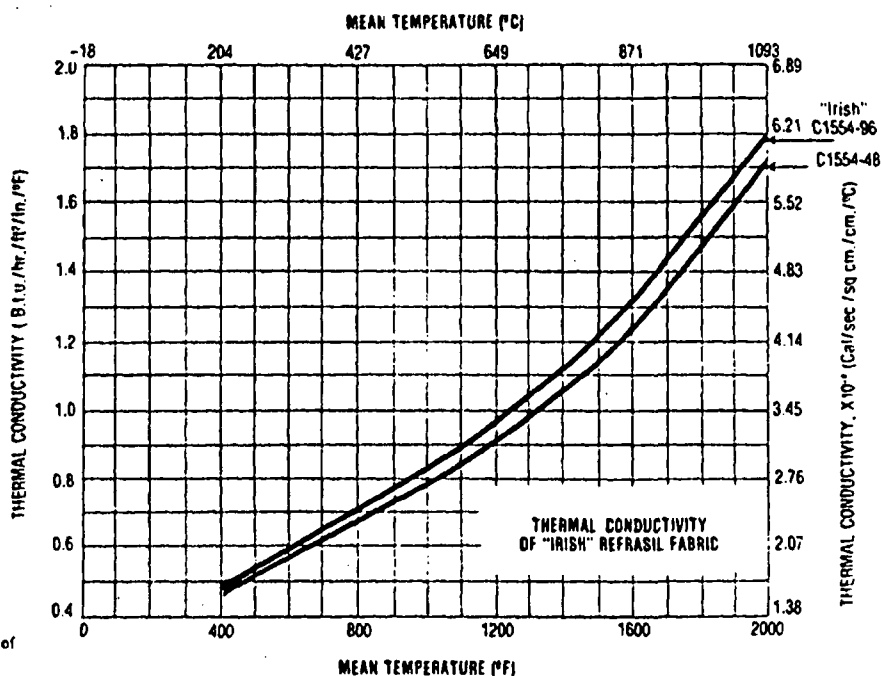
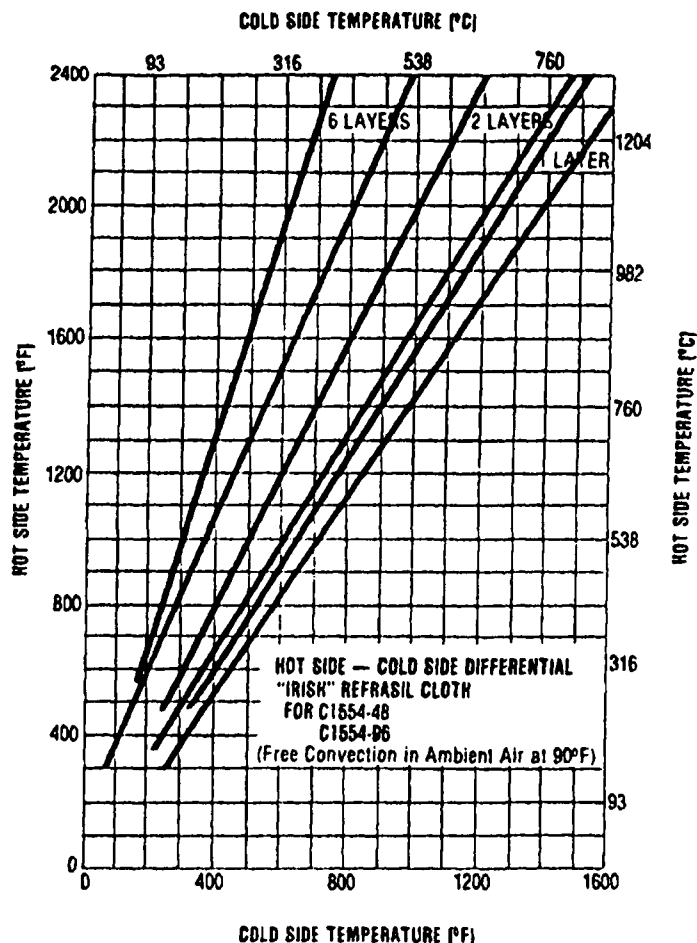
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maintenance time and costly repairs on equipment by protecting parts from high temperatures and greatly expanding operational life. "Irish" REFRASIL insulation has the ability to withstand higher temperatures than standard REFRASIL insulation, and the increased flexibility of the cloth under extreme heats, has permitted "Irish" REFRASIL insulation to be utilized in many new applications.

Cloth is the standard form for "Irish" REFRASIL insulation and is available in three weights/thicknesses. Most other REFRASIL insulation product forms, such as tapes and sleeving, are available as "Irish" on a special order basis.

For further details call or write:

Materials Division of HITCO
a subsidiary of Armco Steel Corporation
1600 West 135th Street
Gardena, California 90249
(213) 321-8080



REFRASIL® trademark of HITCO
Armco and the Armco Triangle® trademarks of
Armco Steel Corporation, Middletown, Ohio

LHT MD-275 6M CP 1-75

LITHO IN U.S.A.

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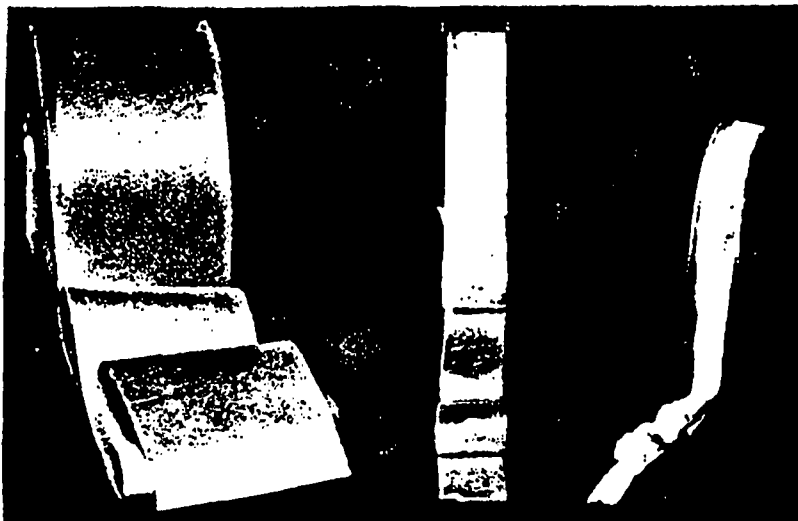
REFRASIL®

Refractory silica in textile form

INSULATION

PRODUCT DATA BULLETIN TAPE

REFRASIL tapes for continuous use to 1800°F*



REFRASIL tapes retain strength and flexibility in insulation applications at temperatures to 1800°F (982°C). Their low thermal conductivity can help you save heat energy.

They are fireproof and can protect against contamination, marking and damage to parts. They resist oxidation, and most corrosive solutions.

*Irish REFRASIL tape extends the performance temperatures to 2300°F (1260°C) with little or no change in properties.

Slit tape

Product Description	Product Code	Nominal Thickness (in.)	Nominal Width (in.)
Standard Tape (w/adhesive)	UT-48-2	.026	2
	UT-48-4	.026	4
	UT-96-2	.050	2
	UT-96-4	.050	4
Treated Tape (no adhesive)	2220-48-3	.028	3
	2220-48-6	.028	6
	2220-96-3	.052	3
	2220-96-6	.052	6
Irish Tape (no adhesive)	2221-48-2	.028	2
	2221-48-4	.028	4
	2221-96-2	.052	2
	2221-96-4	.052	4

REFRASIL slit tapes are available in the same forms as REFRASIL cloth: standard, with pressure sensitive adhesive backing, treated with no adhesive, and treated Irish with no adhesive.

Special widths are available as custom slit tape from standard 50 lineal yard stock rolls of cloth products.

Standard roll size

Standard slit tape roll size is 100 lineal feet, plus or minus 10% length tolerance. No roll contains more than three pieces with single pieces not less than 20 lineal feet.

Woven tape

Product Description	Product Code	Nominal Thickness (in.)	Nominal Width (in.)
Standard Tape	UT100-1	.015	1
	UT100-1½	.015	1½
Pre-Shrunk Tape	TF100-1	.015	1
	TF100-1½	.015	1½

REFRASIL woven tape is available in standard or pre-shrunk forms. Pre-shrunk should only be used where shrinkage due to continuous high temperature environment cannot be tolerated. REFRASIL woven tapes have salvaged edges to prevent raveling.

Standard roll size

Standard tape roll size is 285 lineal feet, plus or minus 10%. Pre-shrunk tape roll size is 265 lineal feet, plus or minus 10%. All rolls are one continuous length, no splices.

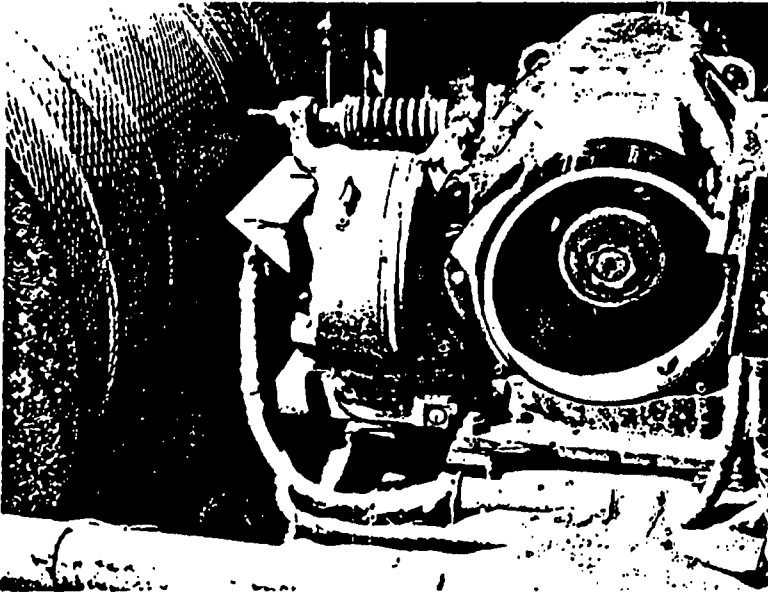
Armco and the Armco Triangle ® trademarks of Armco Steel Corporation, Middletown, Ohio. REFRASIL ® trademark of HITCO.

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PRODUCED BY FORD

REFRASIL tape is proved in service

Insulating motor leads at high temperatures



REFRASIL tape insulates this crane motor lead in the Basic Oxygen Shop of a steel mill. Even though the lead is directly over where molten metal is poured, the REFRASIL tape protects it from 5 to 6 times as long as the asbestos wrap previously used—through eliminated delay time, REFRASIL tape has saved more than \$10,000.



On the power lead for this blast furnace mud gun, REFRASIL tape outlasts previously used asbestos 9 to 1, resulting in great savings in time and trouble.

Tape curtains save $\frac{1}{3}$ on heat



REFRASIL tape used in curtains on this brazing furnace cut use of natural gas by $\frac{1}{3}$ and doesn't contaminate the product.

Where can you use this superior insulation? REFRASIL tape and other REFRASIL textile insulation is proving itself in more and more high-heat applications. It's worth considering for your hot jobs. For further details, call or write:

Materials Division of HITCO, a subsidiary of Armco Steel Corporation, 1600 West 135th Street, Gardena, California 90249. Phone (213) 321-8080



REFRASIL®

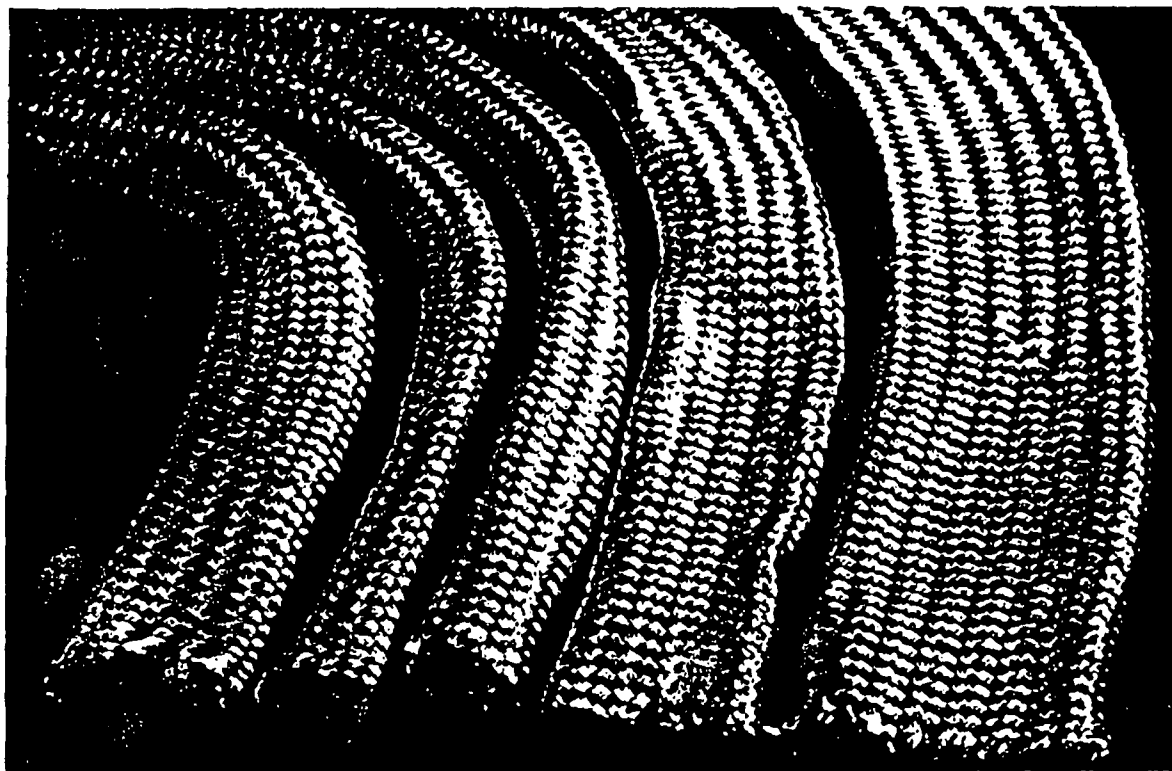
Refractory silica in textile form

INSULATION

PRODUCT DATA
BULLETIN
STANDARD &
HEAVY WALL
SLEEVING



Sleeving does not lose strength and remains flexible to 1800°F



REFRASIL sleeving resists continuous temperatures to 1800°F (982°C) while retaining its strength and flexibility. It helps conserve energy because of low thermal conductivity. Absolutely fireproof, it is also resistant to oxidation and most corrosive solutions, and does not degrade in the presence of water.

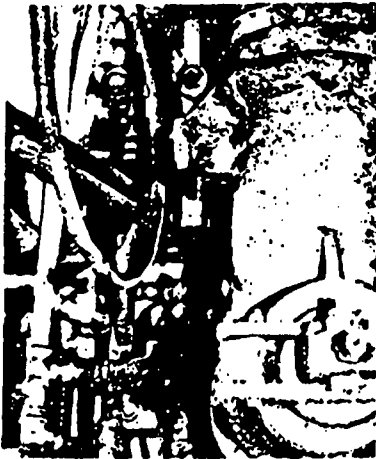
REFRASIL sleeving is available as standard or heavy wall. The looser weave of standard sleeving can accommodate a larger variety of diameters. Heavy wall sleeving has a very tight weave for maximum thermal protection.

REFRASIL sleeving comes in these sizes:

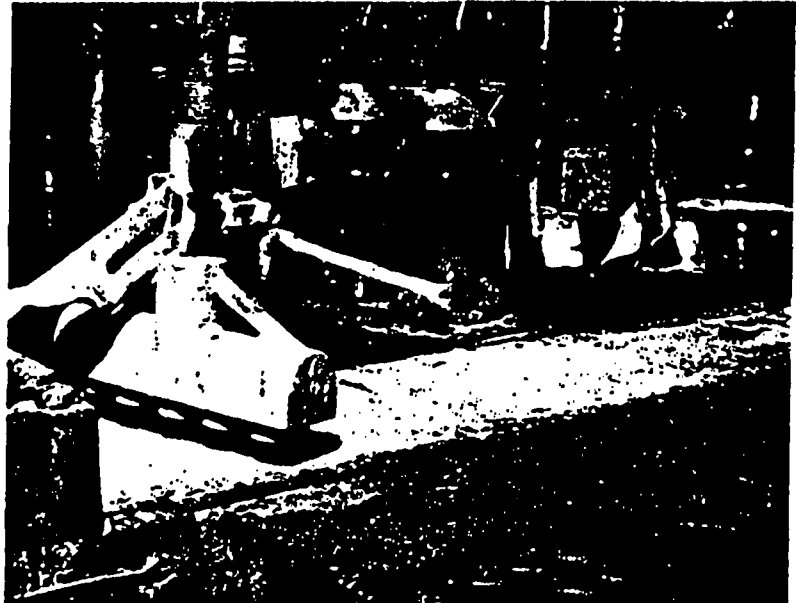
	Code	Nominal I.D. (in.)	Maximum I.D. (in.)
Standard Nominal Wall Thickness—.032 in.	UB-¾	¾	.95
	UB-1	1	1.30
	UB-1½	1½	2.50
	UB-2	2	3.20
	UB-2½	2½	3.30
Heavy Wall Nominal Wall Thickness—.065 in.	HWS-¾	¾	.40
	HWS-½	½	.60
	HWS-¾	¾	.80
	HWS-1	1	1.10
	HWS-1½	1½	1.60

A special coating is available for improved abrasion resistance

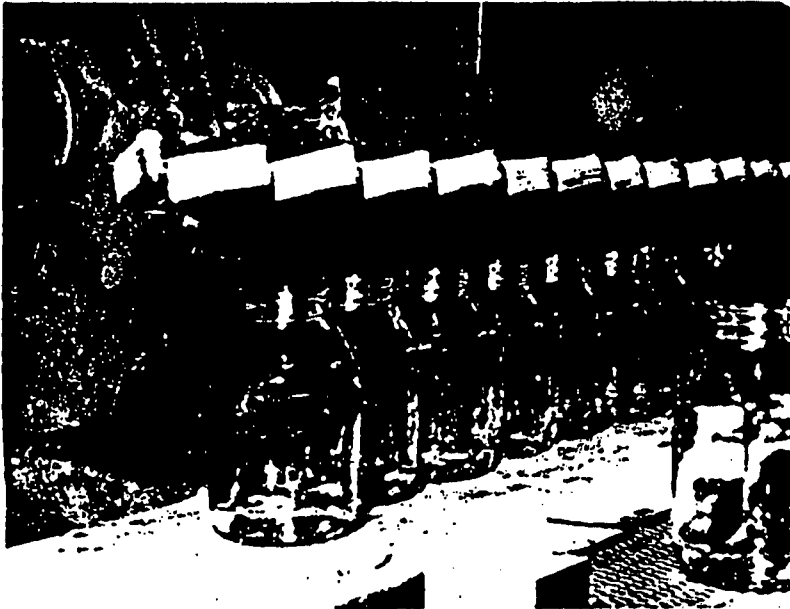
Proved in many high-heat uses



The REFRASIL sleeve on this blast furnace tuyere hose is splashed with molten slag, yet its service life is projected to be 6 months—about 20 times the life of asbestos used before.



Additional REFRASIL sleeving applications in the glass manufacturing industry include guide arms, push out heads, paddle wheels, tongs, forks and vacuum take out heads.



REFRASIL sleeving is ideal for many applications in the glass manufacturing industry. Shown above is REFRASIL sleeving insulating a pusher bar in a bottle container plant.

Investigate REFRASIL insulation for your hot jobs. REFRASIL sleeving and other forms of REFRASIL textiles are cutting maintenance time and costs in more and more high-heat applications. For further details, write or call:

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