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Bechtel Corporation

Power & Industrial Division

San Francisco

November, 1972

MECHANICAL ENGINEERING BULLETIN No. 4, Revision II

Thermal Insulation

OSHA Standards - Asbestos

Section 1910.93 a, a new OSHA Standard, covers exposure to asbestos fibers. A copy of this new standard, excerpted from the OSHA Reporter, is attached for information.

Asbestos-Free Calcium Silicate

Major manufacturers are offering asbestos-free calcium silicate insulation as a consequence of OSHA requirement on asbestos dust exposure. Such insulation is now available from Pabco and Owens Corning Fiberglas. Johns Mansville will be able to furnish this type of insulation by the second quarter of 1973. Philip Carey's "Careytemp 1500", an expanded perlite, also contains no asbestos.

Corrosion and Chloride Requirements

Mineral-based insulation, cement and adhesives to be installed on stainless steel surfaces shall conform to all requirements of Military Specification MIL-I-24244, Amendment 3. These shall include tests for chloride stress corrosion, and chemical analysis to confirm allowable chloride, silicate and sodium content.

Unbonded Glass Fiber Insulation

This type of insulation is not acceptable. In those cases where the surface temperature or nuclear radiation would destroy the effectiveness of available bonding materials during operation, the specifications should require that the necessary insulation properties be maintained even with the binder rendered ineffective.

Spray-on Type Poly-urethane Insulation

This material is specified by its manufacturer to be fire-retardant and self-extinguishing and is rated as non-burning under ASTM Specification D-1692-59T. However, field experience has indicated that spray-on or pour-in-place type poly-urethane insulation may be a potential fire hazard under certain conditions.

This type of insulation is applied by mixing two components to form organic polymers. If these two componenets are not mixed properly, unpolymerized volatile constituents may remain which could be ignited by the heat generated by the material while it is curing or by other hot items. Other tests indicate that the cured material may not be fully resistant to combustion by high heat intensities.

Consequently, if this material is used, the manufacturer's instructions for mixing must be closely followed, and a fire watch should be provided during the application and curing period. Since this material is also available as preformed rigid blocks, the block type insulation should be used instead of the spray-on or poured type whenever possible.

J. H. Blasingame

CBT:sjk

Attachment

Batchelo 00004175

Super Caltemp®

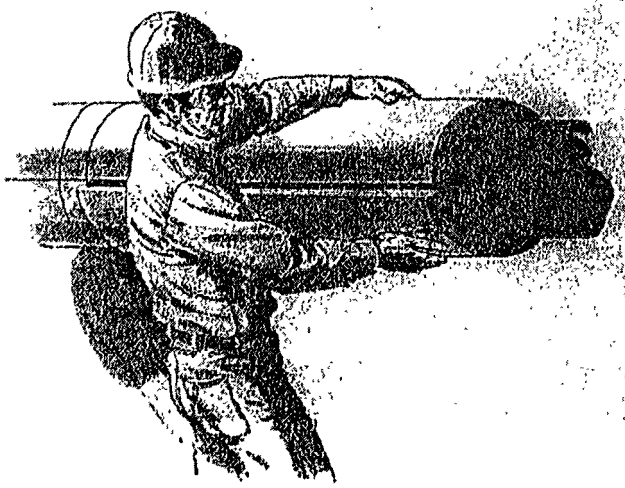
Type NA

Sophisticated process industries, particularly in the petro-chemical and refining fields, require precise temperature control. Other industries, such as power generation and pulp/paper producers, need insulation to conserve energy and reduce costs. These companies—and the design, engineering and construction firms who serve them—look to Pabco Super Caltemp, Type NA, for safe, reliable and economical control.

Super Caltemp, Type NA. Available in pipe covering, blocks, preformed elbows and cements.

Batchelo 00004176

Super Caltemp, Type NA, contains no asbestos. With Super Caltemp, you don't have to worry about the tough federal regulations regarding asbestos dust control. Why? Because Super Caltemp, Type NA, is ABSOLUTELY ASBESTOS FREE. And that's not all.*



Only Super Caltemp, Type NA, offers these combined advantages

Stainless steel corrosion protection. Super Caltemp, Type NA, is an inhibited product and does not contribute to stress corrosion cracking of austenitic stainless steel. As far as we know, no installation of austenitic stainless steel has ever failed when Super Caltemp, Type NA, was used in the insulation system. (For details and results of laboratory tests, see Page 6.)

1200°F. use temperature. If you're looking for heat control or conservation of heat energy, Pabco Super Caltemp, Type NA, gives you the K factor you want. Recommended for temperatures from 100°F. to 1200°F inclusive.

Patented "Precision Molded" process assures uniform fit. Other process calcium silicates are "cast" in half-round sections, the legs are then trimmed in an attempt to achieve a true half-circumference pipe covering. Pabco's patented process yields full round "pipes," which are then split in half. Two half sections will match perfectly, even if each section was made years apart. You're assured a uniform fit every time, with minimum time lost in trimming and wiring.

Added protection against damage. Uniformly dispersed fiber reinforcement gives added protection against handling damage, in-service vibration, thermal shock and cracking.

**The Occupational Safety and Health Administration (OSHA) requires the monitoring of asbestos dust levels and maintenance of rigid controls on allowable concentrations. Where engineering methods of control are not feasible, protective respirators must be supplied and employees must be trained to use them. Periodic medical exams for employees exposed to asbestos dust in excess of specified limits are also required. Records of personal and environmental monitoring must be kept for at least 20 years.*

For details see Part 1910.93 and Part 1910.93a of Title 29 of the Code of Federal Regulations.

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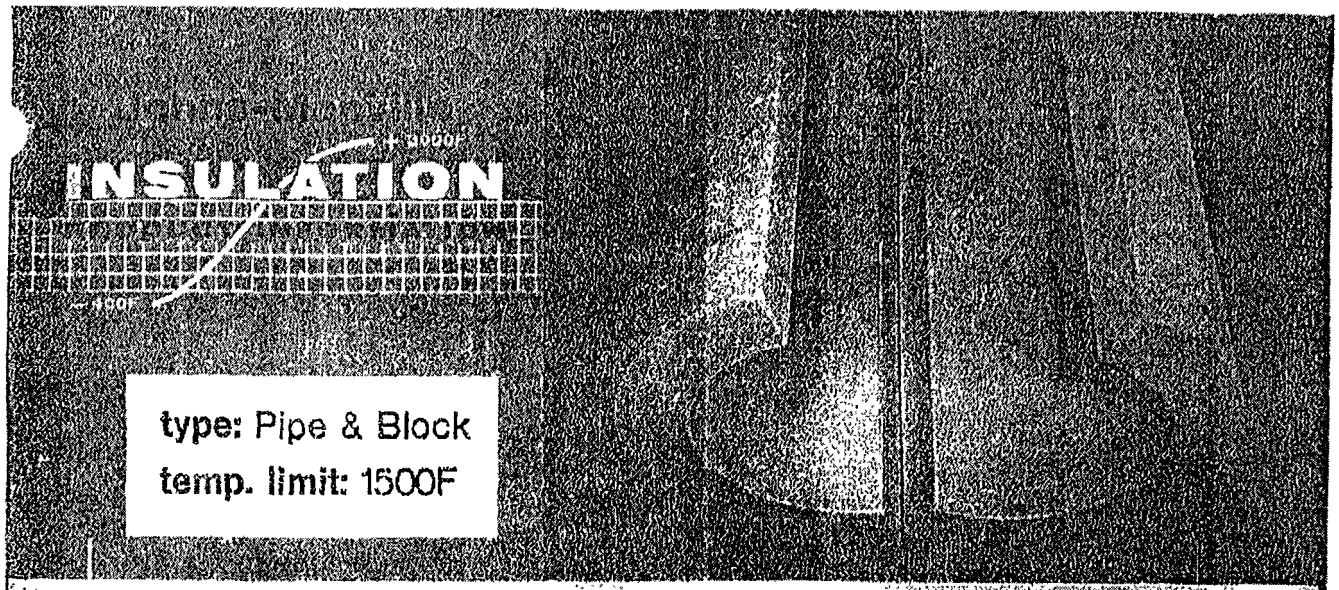

J-M THERMO-12*

asbestos-free pipe and block insulation

DESCRIPTION: A molded, high temperature pipe and block insulation, J-M Thermo-12 is composed of hydrous calcium silicate. It is an insulating material which, because of its light weight, low thermal conductivity, great structural strength and insolubility in water, is ideal for high temperature piping and equipment.

AVAILABLE FORMS: Thermo-12 is furnished in both sectional pipe insulation and block form. The pipe insulation comes in a complete selection of sizes up to 24" x 4" half sections. Pipe sizes 25" through 33" are available in quad segments. Scored blocks 12" x 36" in thicknesses from 1½" to 3½" are available for application on curved surfaces representing a diameter range from 3½" through 180". Scored blocks are furnished with three equally spaced scores. Beveled blocks are also available in widths of 6", 12", and 18", by 36" lengths, in a full range of thicknesses.

USES: Especially recommended for use in the power generation and process industries on indoor and outdoor piping and equipment operating at temperatures to 1500F. Thermo-12 is light enough for easy handling and fast application. Repeated wettings have no permanent effect on it which makes it ideal for installations subjected to weather, or for insulating underground steam lines. Because it will not burn or carry flame, it may also be advantageously specified for use in the presence of inflammable gases and liquids.

ADVANTAGES:

Exceptional Strength

Similar in chemistry and composition to a very fine concrete, Thermo-12 will withstand unusual operating abuse without appreciable damage.

Extreme Lightness

Thermo-12 is as light as many insulating materials possessing a fraction of its strength and durability.

Not Damaged by Water

Can be soaked in water without damage. After drying, conductivity will be as good as new.

Easy Application

Thermo-12 is purposely made in large blocks and half-sections to facilitate handling and reduce number of joints.

Low Conductivity

Thermo-12 offers one of the lowest *k* factors of all insulations in general use throughout the power generation and process industries.

Low Chloride Content

Thermo-12 has a low chloride content and can be used on Austenitic stainless steel without problems since it meets MIL-I-24244 Amendment 3 for chloride content.

*J-M Trademark

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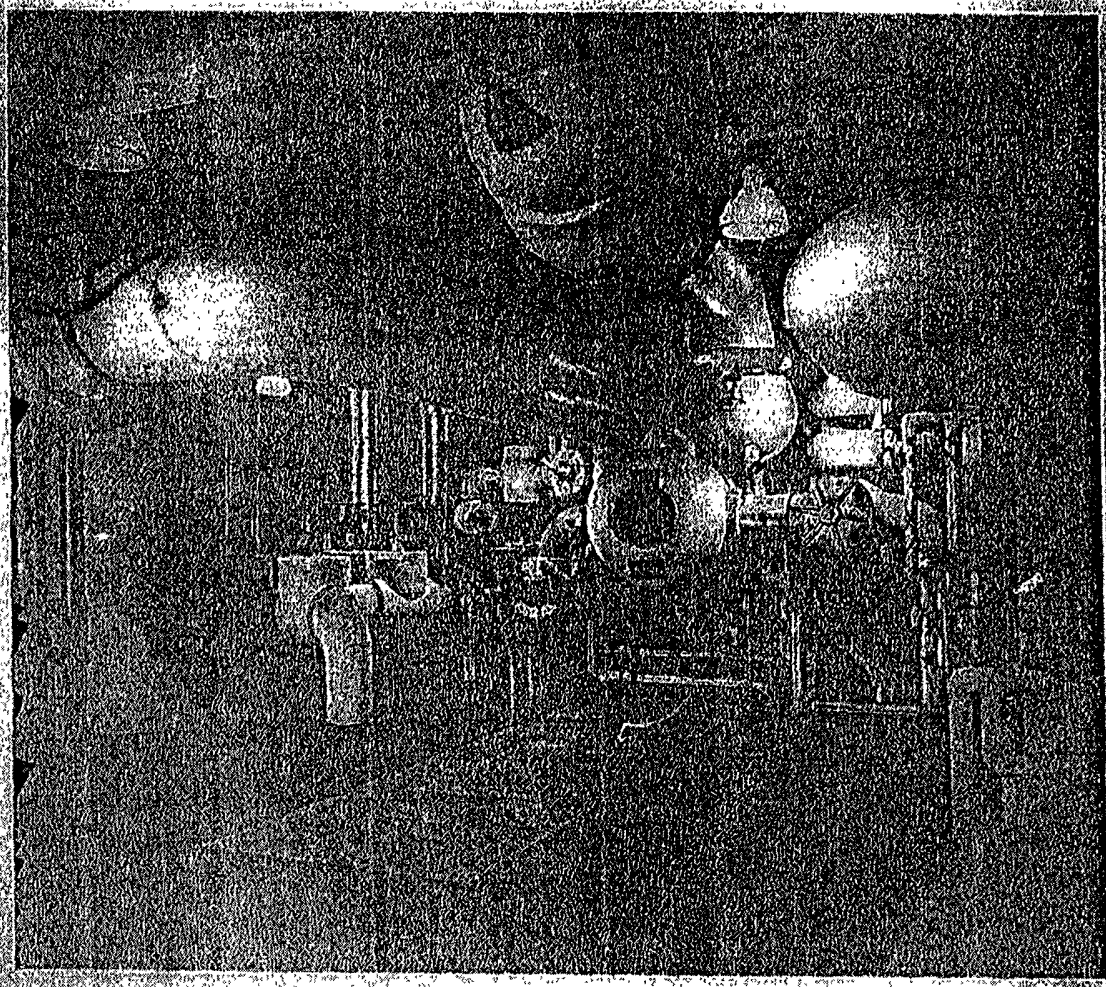
Philip Carey Careytemp 1500 Asbestos-Free Insulation

Pipe and block insulation up to 1500°F.



The Celotex Corporation
July 1972
E15
MECHANICAL SYSTEMS INSULATION

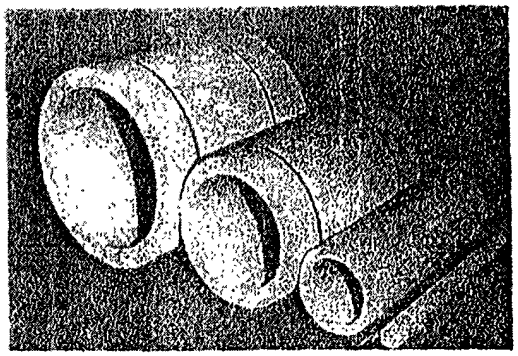
Batchelo 00004179

OWENS-CORNING FIBERGLAS

Commercial D.11
October, 1972

Kaylo 10 Asbestos Free Pipe Insulation

For hot water heating, high temperature hot water, steam condensate piping systems and all heated lines to 1200 F.



uses

Kaylo 10 Asbestos Free* is particularly suitable for use on high temperature piping systems where high performance and extended temperature range are required. Kaylo 10 Asbestos Free is widely used on hot piping where a great degree of physical abuse resistance is required, such as boiler and equipments rooms.

description

Kaylo 10 Asbestos Free Pipe Insulation is a rigid white hydrous calcium silicate insulation molded in sections for all types of indoor and outdoor piping that requires an abuse resistant, durable, efficient insulation, for temperatures up to 1200F. The insulation does not contain any asbestos fibers.

benefits

rugged—Kaylo 10 Asbestos Free Pipe Insulation is a strong and rigid material that resists mechanical damage during shipping, installation and service. It is well suited for riser piping in exposed locations.

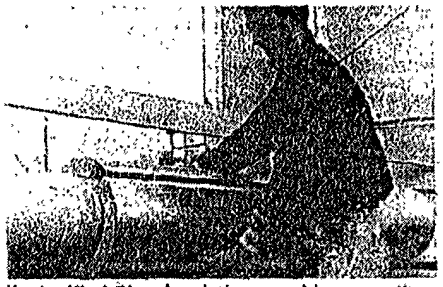
versatile—Kaylo's extended temperature range offers broader use for all hot piping to 1200F.

no asbestos—Kaylo 10 Asbestos Free can be safely used and applied in conformance with proposed OSHA regulations.

will not cause stress corrosion cracking—Kaylo 10 Asbestos Free will not cause stress corrosion cracking of stainless steel because Kaylo 10 Asbestos Free contains an inhibitor and has a very low soluble chloride content.

unaffected by moisture—Kaylo can be completely saturated in water without appreciable loss of strength and regains its strength and thermal value after drying out.

Kaylo Pipe Insulation cuts cleanly with straight square edges. The final result is well insulated piping with a neat finished appearance. Mitered fittings are finished with insulating cement and covered with canvas.



Kaylo Klad Pipe Insulation combines weather-proofing and insulation in one application. Attractive, maintenance-free factory-applied jackets of stainless steel and aluminum are complete with longitudinal locking seams and end joint butt strips.

*Trademark of Owens-Corning Fiberglas Corp.

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