Armstrong
CONTRACTING AND SUPPLY
CORPORATION

SPRAYED "Limpet" ASBESTOS

THERMAL INSULATION FOR HIGH TEMPERATURE APPLICATIONS

Specifications

1963 EDITION

SPECIFICATIONS

"SPRAYED "LIMPET" ASBESTOS

For High Temperature Applications

How to Use These Specifications

In the following specifications, there has been no attempt to group items by crafts, since this is not properly a part of the specification but is within the jurisdiction of the construction trade.

To form a complete specification, simply copy all paragraphs except those not pertinent to the job at hand. Extra copies of this specification will be supplied on request.

PROPERTIES OF LIMPET

Description

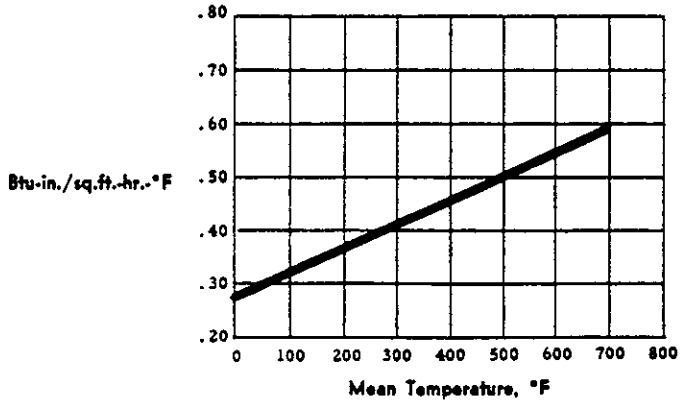
Limpet is thermal insulation formed by spraying specially blended and prepared pure asbestos fibers and an inorganic binder together with jets of atomized water through special patented equipment to the surface to be insulated.

The product is available in two grades:

LW-25 for use to 700°F
LB-8 for use to 1350°F

Limpet can be built up in one operation to thicknesses varying from ¼" to 12". The resultant material, drying naturally, forms a permanent homogeneous, tight-fitting insulation. Where required, it may be provided with a smooth hard surface finish.

Average applied dry density of both grades of Limpet is approximately 12 lbs. per cu. ft. The thermal conductivity is shown in the chart below:



Additional physical properties and technical data are available on request.

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ENGINEERS' AND ARCHITECTS' SPECIFICATIONS

Brief Specification

Furnish and install Sprayed Limpet Asbestos in the areas listed below or where shown on the drawings.

All products covered in this specification are to be installed in accordance with procedures prescribed and approved by Armstrong Contracting and Supply Corporation.

Complete Specification

Scope

1. General

The general conditions of the contract are a part of this specification.
This specification covers the furnishing, delivering, unloading, hauling, storing, protection, and application of Limpet to complete all insulated surfaces as shown on the drawings or herein specified.

2. Work Included

The contractor shall furnish all supervision, labor, materials, tools, and equipment to perform the work specified herein.

3. Supplied by Owner

Owner shall furnish 200 to 220 volts, 60 cycle, single or three phase A.C. electric power, water at no less than 35 p.s.i. pressure (4 gallons per minute), and air at 8 cu. ft. per minute.

Materials

4. Sprayed Limpet Asbestos

a. Insulation shall be Limpet of appropriate grade, as supplied by Armstrong Contracting and Supply Corporation; LW-25 for use to 700°F or LB-8 for use to 1350°F, or

b. 100% comparable asbestos fibers with a suitable inorganic binder, free from adulterants in the form of rock, mineral, slag, or glass wool.

5. Finishing Materials

a. Finish shall be

(1) Armstrong BD-2 Cement as supplied by Armstrong Contracting and Supply Corporation, or

(2) A factory-mixed combination of asbestos and portland cement formulated to be compatible with Limpet and to provide a hard durable surface with minimum cracks.

b. Finish shall be

(1) Foster's HiLastic 60-99 or

(2) A factory-mixed fibrated asphalt emulsion of comparable quality, suitable for use as a weather barrier for high temperature insulation.

c. Finish shall be

(1) Foster's Lagfas 81-42W in combination with finish coat of Foster Lagtone, or

(2) A pigmented synthetic base coating of comparable quality, compatible with asphalt and suitable for exposure to the elements.

d. Finish shall be

(1) Aluminum sheet metal, corrugated or smooth, of suitable thickness and in all cases furnished with an attached moisture barrier.

Application

6. General (For Tanks, Vessels, Equipment, Piping 12" and over, Ducts, Breechings and all Conventional Flat or Curved Surfaces Receiving Insulation)

a. Surface Preparation—Prepare as necessary, removing all grease, dirt, and loose material such as flaking paint and rust likely to interfere with bond of Limpet to base surface.

b. Supports—Except for Limpet thicknesses 1" and less and where the Limpet can be tied into itself such as where applied completely around vertical or horizontal pipes or ducts up to approximately 2 ft. in cross-section, supports are recommended. Supports shall be in the form of 10 ga. pins or studs of appropriate length welded to the surface, or cables, bands, or rods, mechanically fastened to the surface to be insulated. These supports shall be used for anchoring galvanized wire mesh, located over the applied Limpet insulation. (See Drawings #1 and 2.)

c. Limpet Application—Application of Limpet shall be carried out solely by approved

applicators, licensed by Armstrong Contracting and Supply Corporation, and shall be—

(1) By skilled mechanics, thoroughly trained by Armstrong Contracting and Supply Corporation,

(2) Applied with the use of patented Limpet Spray Machinery,

(3) Even in texture and applied to density and thickness as defined in this specification and listed on drawings and written instructions issued for this specific contract.

d. Indoor Finish—

(1) **Exposed Limpet** — In concealed spaces and where equipment is not exposed to mechanical abrasion, Limpet, after pressed to desired thickness, may be left exposed either with or without wire mesh support (see Section 6b) without impairing its performance.

(2) **Armstrong BD-2 Cement**—After Limpet has been applied and pressed to the proper thickness, where applicable (see Section 6b on Supports), apply 1" hexagonal 20 ga. wire mesh (galvanized or monel as specified), stretching, lacing, and securely fastening to itself or to supports. Protect corners on square or rectangular equipment with surface corner beads. (See Drawing #2.)

Note: 16 ga. black iron or stainless steel wire may be used in lieu of wire mesh.

Over the wire mesh, trowel a 3/8" coat of Armstrong BD-2 Cement to a smooth finish. In areas larger than approximately 8 ft. in either direction, score BD-2 prior to drying with a cement finisher's tool through to the Limpet to control cracking. The scoring should be in the form of panels about 4 ft. square.

(3) Canvas Finish—Apply 6 or 8 oz. canvas over BD-2, lapping fabric seams a minimum of 2", using Foster's Lagfas 81-42W or approved equal. Apply at rate of 100 sq. ft. per gallon. Finish with one coat of Foster's Lagtone (color as selected) at rate of 80 to 90 sq. ft. per gallon. Eliminate scoring of BD-2 specified in Section 6d(2).

e. Outdoor Finish—

(1) Weatherproof Mastic—After Limpet has been applied and pressed to proper thickness, apply Foster HiLastic 60-99, or approved equal, as specified by the manufacturer, using supporting metal mesh, if any, as reinforcing medium; otherwise, apply layer of glass membrane or wire mesh as specified by finish manufacturer.

(2) Hard Weather Finish—After Limpet has been applied and pressed to proper thickness, where applicable (See Section 6b on Supports), apply 1" hexagonal 20 ga. wire mesh as specified in Section 6d(2). Over this, trowel Armstrong BD-2 Cement to a thickness of 1/4". Additionally finish as above under Section 6e(1).

(3) Fire Resistant Finish—Over metal mesh, apply Foster's Safetee Mastic 60-80, or equal, in accordance with manufacturer's specifications.

(4) Corrugated Aluminum Jacket with Factory Applied Moisture Barrier (See Drawing #3). After studs have been properly located and Limpet has been applied and pressed to desired thickness, start the first course of corrugated aluminum sheets. Lap the vertical joint a distance of 2 corrugations.

About 6" from the base of the first course, place a 3/4" wide x .02" thick stainless steel strap with breather spring as manufactured by the Techalloy Company, Inc., or equal. Other bands and breather springs should be placed on centers not to exceed 4 ft.

At top of first course, place "S" clips at every sixth valley. This supports the second course.

Place the second course of corrugated sheets in the "S" clips, lapping the vertical joint the same as the first course. Place a band 4" to 6" above the bottom of the lap. Impale the top of the second course over the welded studs. The bottom of the third course is impaled over the studs at the top of the second course, minimum lap 3".

Place aluminum burr over aluminum head. Upset aluminum head of stud with rivet set or steel hammer.

Intermediate bands and breather springs are applied as above between laps, on not more than 4' centers.

Seal around protruding angles, etc., with Foster's Foamseal 30-45, or equal.

7. Steam Turbines (Special Standardized Procedure for Insulating Steam Turbines)

a. General—Surface preparation, workmanship, and equipment shall be as described above in Section 6a, b, and c.

b. Supports—Supports are required on the bottom half of the turbine casing in the form of either ⅛" x ⅜" split pins of the proper length, welded to the lower half of the casing on 18" centers, or ¼" studs fastened on the same centers through drilling and tapping (see Drawing #4).

(In lieu of the pins or studs, adequate support can be derived from the use of a series of brackets and straps on the outer surface of the insulation as shown in Drawing #4.)

c. Limpet Application—Limpet shall be built up to the required thickness in a minimum of two layers and where adjacent surfaces have heavier thicknesses, a third layer is recommended. Not more than a half hour shall elapse between the application of the individual layers.

Spraying sequence shall be in the following order: Underside of turbine, steam transfer lines above the casing, top half of turbine casing, horizontal flanges, steam main to casing, and valve chests and auxiliaries.

(1) Turbine casing and transfer lines—A suitable area on the underside of the casing shall be chosen for a guide. With water pressure at 15 lbs. per sq. in., (on the basis of water source at spray head), the initial layer of Limpet is sprayed to approximately 2¼". This layer is not pressed but consolidated to approximately 1¼" with the edge of steel trowel, forming a cross pattern.

The split pin supports are then spread or speed washer supports are applied in the event of the use of studs.

With water pressure reduced to 12 p.s.i., spray second layer to approximately ½" greater than the required thickness and press to final thickness. After guide layer is complete, repeat the procedure in adjacent areas until the bottom half is covered.

Follow same procedure to insulate top half of casing, eliminating supports.

(2) Flange Bolts—Wrap bolts above flanges with asbestos paper or cloth and secure with wire. Pack space between bolts with dry Limpet fiber.

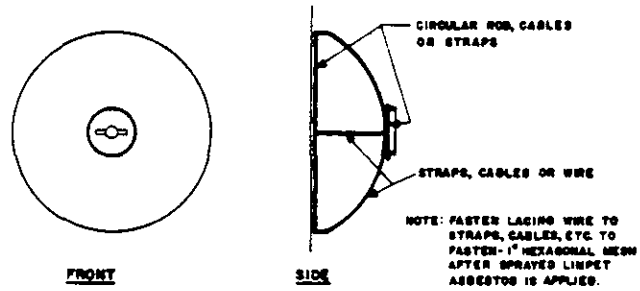
(3) Flanges—Taper Limpet into casing at flanges to provide easy removal. Adhere asbestos paper, ¾ the length of the taper with sodium silicate or staples and spray Limpet to the paper.

d. Finish—

(1) Metal Casing—Leave Limpet in natural pressed state. Do not completely close casing until all moisture has been evaporated.

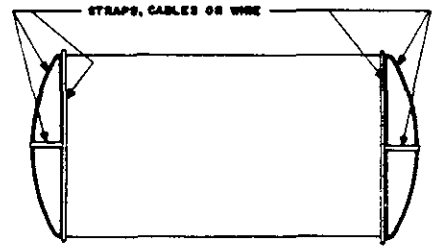
(2) Armstrong BD-2 Cement—Finish Limpet with ¼" coat of BD-2, reinforced with 1" 20 ga. hexagonal galvanized wire mesh (monel or stainless as specified), securely fastened to supports. After dry, score in 4 ft. square panels through to the Limpet, using a cement finishing tool.

LIMPET DWG. #1—SUPPORT DETAILS—CYLINDRICAL EQUIPMENT



STEAM DRUM HEAD

NO SCALE

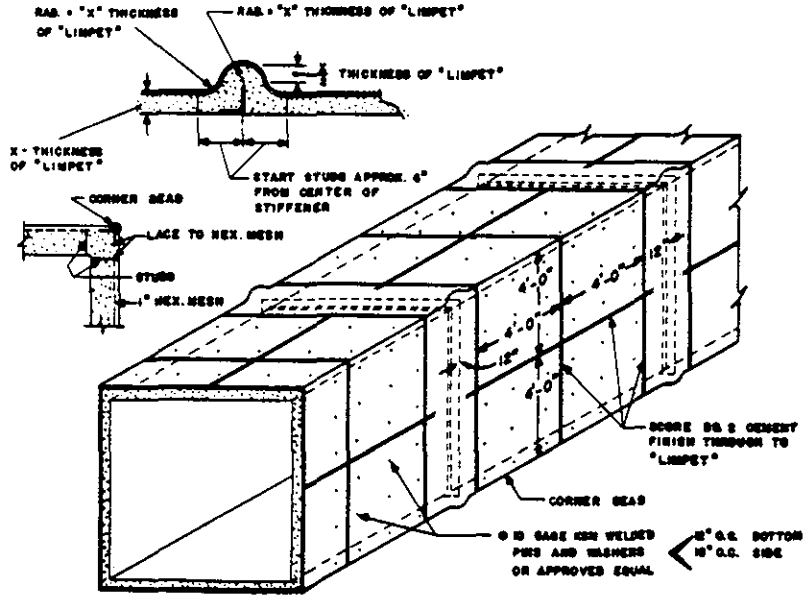


STORAGE TANKS ETC.

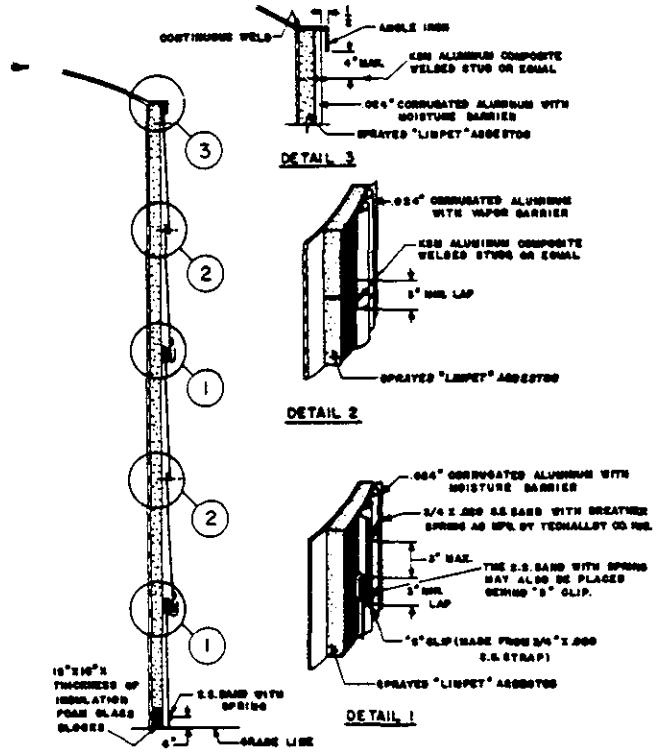
NO SCALE

NOTE: FASTEN LACING WIRE TO STRAPS, CABLES, ETC. TO SECURE 1" HEXAGONAL WIRE MESH AFTER SPRAYED "LIMPET" ASBESTOS IS APPLIED. RSN OR EQUAL WELDED STUDS MAY BE USED IN LIEU OF STRAPS, CABLES, ETC.

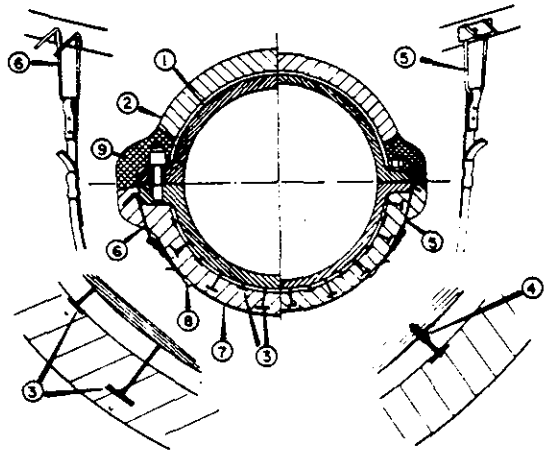
LIMPET DWG. #2—TYPICAL DUCT SPECIFICATION



LIMPET DWG. #3—ALUMINUM FINISH SPECIFICATION



LIMPET DWG. #4—TYPICAL STEAM TURBINE SPECIFICATION



NOTES -

1. HIGH DENSITY LAYER.
2. NORMAL DENSITY.
3. KSM RECTANGULAR WELDING PINS 1/8" X 3/8" SPLIT TO THE PROPER LENGTH.
4. ALTERNATE IF WELDING IS NOT PERMISSABLE, CASING TO BE DRILLED AND TAPPED FOR STUDS AND SPEED WASHERS.
5. STRAP BRACKET SCREWED ON.
6. STRAP BRACKET WELDED ON.
7. S.S. STRAP 3/4" X .020" THICK.
8. SEAL.
9. SEPERATE FLANGE JOINT ISOLATION.

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