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ARMASPRAY 16TM

SPECIFICATIONS

for

High Temperature Applications

1967 EDITION - REVISED

Armstrong

CONTRACTING AND SUPPLY
CORPORATION
LANCASTER, PENNSYLVANIA

338757

ARMASPRAY 16 SPECIFICATIONS

for High Temperature Applications

How to use these Specifications

To form a complete specification, simply copy all paragraphs except those not pertinent to the job at hand.

PROPERTIES OF ARMASPRAY 16

Description

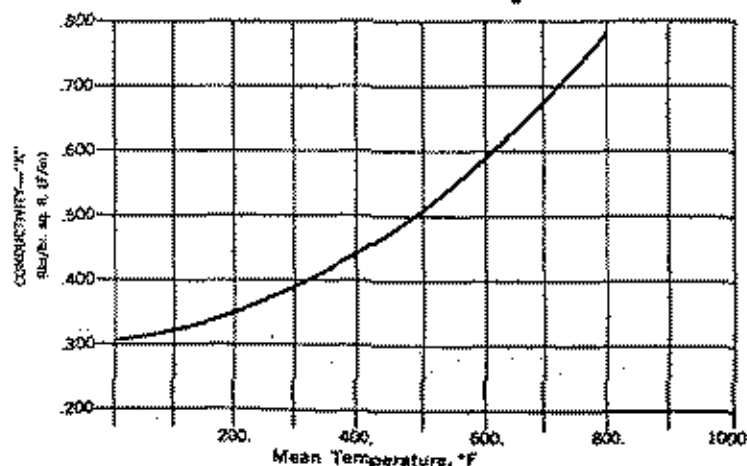
Armaspray 16 is a blend of mineral wool fibers, asbestos fibers and inorganic binders. The process and equipment used in preparation of the mineral wool is covered by U. S. Patent 3,222,924. This highly refined mineral wool assures optimum physical characteristics of the end product. The product is processed from 50 lb. bales of com-

pressed dry material—at the job site—through the special Armaspray Spraying Machine. The Armaspray 16 is dampened in mid-air by atomized water as it leaves the spray gun. The semi-plastic material is then pressed or tamped with wooden or metal tools to produce a smooth surface and a monolithic coating.

Typical Properties

Maximum Service Temperature (ASTM C 411-61)	1600° F.
Fusion Temperature	2200° F.
Fired Shrinkage	1200° F. 24 hrs. soak, 1.5% linear change.
Density (after spraying and drying)	10 to 14 lbs./cu. ft.
Thermal Conductivity (ASTM C 182-47)	0.34 Btu/hr. sq. ft. (F/in.) @ 200 0.44 Btu/hr. sq. ft. (F/in.) @ 400
Compressive Strength (ASTM C 165-54)	7 to 12 psi (25% compression) @ 10 to 14 lbs./cu. ft.
Specific Heat (ASTM C 351-61)	.21 Btu/lb./°F.
Chloride Content, Max.	20 p.p.m.
Hygroscopicity	1.5% gain in weight after drying to constant weight. Then exposed to air at 70° F. and 90% R.H. for 14 days.
Drying	24 hours at 73.4° F., 50% R.H. 2' of air per minute. (Sample 1.5" thk.)
Curing	Reaches 90% of ultimate strength in seven days.
Setting Time	2 to 3 hours, depending on ambient conditions.
Combustibility	Incombustible in accordance with ASTM C-411 up to 1600° F.
Corrosion	Does not contribute to the corrosion of steel.

Thermal Conductivity



338758

ENGINEERS' AND ARCHITECTS' SPECIFICATIONS

Brief Specifications

Furnish and install Armaspray 16 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 Specifications

Scope

1. General

This specification covers the furnishing, delivering, unloading, hauling, storing, protection, and application of Armaspray 16 to complete all insulated surfaces as shown on the drawing 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 230 volt, single phase, 35 amp electrical power and potable water at a minimum flow rate of 2 gallons per minute.

Materials

4. Insulation

The insulation material shall be Armaspray 16 as supplied by Armstrong Contracting and Supply Corporation, Lancaster, Pennsylvania, applied to result in a density of approximately 10-14 lbs. per cubic foot after spraying, pressing, and normal drying.

5. Finishing Materials

- a. Finish shall be Armstrong No. 10 Cement as

supplied by Armstrong Contracting and Supply Corporation.

- b. Finish shall be a breathing type weather-proof mastic, compatible with Armaspray 16 and Armstrong No. 10 Cement and applied and reinforced as recommended by the manufacturer of the mastic.
- c. Finish shall be aluminum sheet metal, corrugated or smooth, of suitable thickness and furnished with an attached moisture barrier.

Application

6. General

(For Tanks, Vessels, Equipment, Piping 14" and over, Ducts, Breeching, and all Conventional Flat or Curved Surfaces Requiring Insulation. For steam turbines see Special Procedure, Item 10)

- a. Surface Preparation—prepare as necessary, removing all grease, dirt, and loose materials such as flaking paint and rust likely to interfere with bond of Armaspray to base surface.

- b. Where it is found desirable to apply Armaspray 16 in more than 1 layer, the surface of the first layer shall be wetted with the spray water before the 2nd layer is applied.
- c. Provisions shall be made by Others to protect the Armaspray 16 insulation surfaces from foot traffic and other severe mechanical abrasion.

7. Armaspray

Application of Armaspray 16 shall be carried out solely by Armstrong Contracting and Supply Corporation, and shall be:

- a. By skilled mechanics thoroughly trained by Armstrong Contracting and Supply Corporation.

- b. Applied with approved Armaspray machinery, and

- c. Even in texture and applied to density and thickness as defined in this specification and listed in drawings and written instructions issued for this specific contract.

8. Supports

Although in some instances Armaspray 16 can be considered self-supporting and requiring no support, mechanical supports are more generally required as detailed below.

NOTE 1: In all cases where excessive vibration occurs, mechanical supports are required even though they may not otherwise be specified.

NOTE 2: Regardless of the thickness of insulation, support rings are required on a minimum of 20' centers on all vertical equipment.

a. For all Vertical Tanks, Vessels, and Equipment

- Up to 2" in thickness and where insulation completely envelops the surface, that is, where it can be tied into itself such as around the tank, etc.—no mechanical supports are required except as noted in special NOTES 1 and 2 above.
- Above 2" and up to 4" in thickness—reinforce with a system of 10 gauge pins welded to the insulated surface on 24" centers and 1" 20 gauge hexagonal mesh (galvanized or Monel, as specified) fastened on the surface of the insulation with

speed clips to the pins.

- Above 4" and up to 8" thickness—reinforce with a system of 10 gauge pins welded to the insulated surface on 18" centers and 4" x 4" squares of galvanized 20 gauge $\frac{1}{2}$ " hardware cloth, fastened with speed clips to the pins at the mid point of the insulation thickness and with 1" 20 gauge hexagonal wire mesh (galvanized or Monel, as specified) fastened on the surface of the insulation with speed clips to the pins.

b. For Horizontal Tanks, Vessels, and Equipment

- Up to 2" in thickness and not exceeding 48" in diameter—no mechanical supports are required except as noted in special NOTE 1 above.
- Above 2" and up to 4" in thickness and/or over 48" in diameter—reinforce bottom 180° of the main body and the tank, vessel or equipment heads with a system of 10 gauge pins welded to the insulated surfaces on 24" centers and 1" 20

gauge hexagonal wire mesh (galvanized or Monel, as specified) fastened on the surface of the insulation with speed clips to the pins.

- Above 4" and up to 8" in thickness—reinforce the main body and tank, vessel or equipment heads with a system of 10 gauge pins welded to the insulated surfaces on 18" centers and 4" x 4" squares of galvanized 20 gauge $\frac{1}{2}$ " hardware cloth

fastened with speed clips to the pins at the mid point of the insulation and with 1" 20 gauge hexagonal wire mesh (galva-

nized or Monel, as specified) fastened on the surface of the insulation with speed clips to the pins.

c. For Ducts and Breeching

- Up to 4" in thickness—reinforce all sides of the duct or breeching with a system of 10 gauge pins welded to the exterior of the surfaces to be insulated (12" on center on the bottom and 18" on the sides and top) and 1" 20 gauge hexagonal wire mesh (galvanized or Monel, as specified) fastened on the surface of the insulation with speed clips to the pins.
- Above 4" and up to 8" in thickness—reinforce all sides of the duct or breeching

with a system of 10 gauge pins welded to the exterior of the surfaces to be insulated (12" on center on the bottom and 18" on the sides and top) and 4" x 4" squares of galvanized 20 gauge $\frac{1}{2}$ " hardware cloth fastened with speed washers to the pins at the mid point of the insulation thickness and with 1" 20 gauge hexagonal wire mesh (galvanized or Monel, as specified) fastened on the surface of the insulation with speed clips to the pins.

9. Finishes

a. Indoor Finish

- (1) Exposed Armaspray 16—in concealed spaces and where the insulation is not exposed to mechanical abrasion, Armaspray, after being pressed to desired thickness, may be left exposed without impairing its performance. Wetting the surface plus steel troweling will further improve the appearance.
- (2) Armstrong Armatemp No. 10 Cement—after Armaspray has been applied and pressed to the proper thickness, apply 1" hexagonal 20 gauge wire mesh (galvanized or Monel, as specified) stretching, lacing, and securely fastening it to itself or to pin supports. Protect corners on square or rectangular equipment with surface corner beads. Over the wire mesh, trowel a $\frac{3}{8}$ " coat of

Armstrong Armatemp No. 10 Cement to a smooth finish. In areas larger than approximately 8' in either direction, score Armatemp Cement prior to drying with a cement finisher's tool through to the Armaspray to control cracking. Scoring should be in the form of panels about 4' square.

- (3) Canvas Finish—apply (6 or 8 oz. canvas as specified) over Armatemp No. 10 Cement reinforced as in Item (2) above lapping fabric seams a minimum of 2" using Armstrong Insulcolor, diluted to lagging consistency. Finish with two coats of Armstrong Insulcolor (color as selected) at a rate of about 150 sq. ft. per gallon per coat. Eliminate scoring of Armatemp No. 10 Cement specified in Section 9a (2).

b. Outdoor Finish

- (1) Weatherproof Mastic—after Armaspray has been applied, pressed to the proper thickness, and allowed to dry, apply the weatherproof mastic as specified by the manufacturer, using the supporting hexagonal metal mesh, if any, as the reinforcing medium; otherwise, apply layer of glass membrane or wire mesh as specified by the finish manufacturer.
- (2) Hard Weather Finish—After Armaspray has been applied and pressed to the proper thickness, apply 1" hexagonal 20 gauge wire mesh (galvanized

or Monel, as specified in Section 9a (2).) Over this apply Armstrong No. 10 Cement to a thickness of approximately $\frac{3}{8}$ ". Additionally finish as above under Section 9b (1).

- (3) Corrugated Aluminum Jacketing with Factory Applied Moisture Barrier—After the Armaspray has been applied and pressed to proper thickness, apply the aluminum jacketing overlapping at all joints and banding and supporting with the use of "S" clips as per standard industry practice.

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

- 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 Armaspray to base surface.
- b. Supports—Supports are required on the bottom half of the turbine casing in the form of either 10 gauge welded pins of the proper length, welded to the lower half of the casing on 18" centers, or $\frac{1}{4}$ " studs fastened on the same centers through drilling and tapping.
- c. Armaspray Application—Armaspray 16 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. The surface of the applied layer of insulation shall be wetted with the spray water before the successive layer is applied whenever sufficient time has elapsed between the two operations to allow the first layer to dry.

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

- (1) Turbine casing and transfer lines—A suitable area on the casing shall be chosen for a guide. The initial layer shall be sprayed to approximately $1\frac{3}{4}$ ". This layer is not pressed, but consolidated with the edge of a steel trowel to approximately $1\frac{1}{4}$ ", forming a cross pattern.

Spray second layer to approximately $\frac{1}{2}$ " greater than the required thickness and press to final thickness. After guide layer is complete, repeat the procedure to adjacent areas until the top half is covered.

Follow the same procedure to insulate the bottom half of the casing, reinforcing each layer with the use of 4" x 4" squares of 20 gauge galvanized $\frac{1}{2}$ " hardware cloth fastened with speed washers to the pins located on 18" centers as detailed in 10b above.

- (2) Flange Bolts—wrap bolts above flanges with asbestos paper or cloth and secure with wire. Pack space between bolts with dry Armaspray 16 fiber.
- (3) Flanges—taper Armaspray 16 into casing at flanges to provide easy removal. Adhere asbestos paper, $\frac{3}{4}$ the length of the taper with sodium silicate or staples and spray Armaspray 16 to the paper.

d. Finish

- (1) Metal Casing—leave Armaspray 16 in natural pressed state. Do not completely close casing until all moisture has been evaporated.
- (2) Armstrong Armatemp No. 10 Cement—finish Armaspray 16 with $\frac{3}{8}$ " coat of Armatemp No. 10, reinforced with 1" 20 gauge galvanized wire mesh (Monel or stainless as specified), securely fastened to supports. When dry, score in 4' square panels through to the Armaspray 16 using a cement finishing tool.

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