

TRIAL NO. 1, 2, 3, AND IMPROVEMENT

Purpose: This study was conducted in order to competitively audit COMINCO versus various insulating cements now on the market, and to investigate the possibility of improving our product while at the same time lowering raw material cost.

Methods: Beginning with a competitive audit of seven insulating cements on January 17, 1959 and ending with a competitive audit of fourteen products on March 26, 1959 in excess of one hundred forty-four insulating cement formulations were mixed, applied, dried, measured and compared. Specimens ranged from 1/4-pound samples to over six pounds.

Each specimen was carefully formulated and mixed with the correct amount of water to determine its optimum water requirements and its wetting characteristics. After soaking requirements were noted, each specimen was carefully placed in a form or on a surface and measured for wet coverage. After wet measurement the specimens were dried and measured for dry coverage and shrinkage (change in volume upon drying). Appearance, cracking and principal direction of shrinkage were also noted.

Data: Data recorded includes constituents of formulation, water soaking requirements, relative trowability, (weight of wet product), wet coverage, dry coverage, shrinkage, weight per board foot, and pertinent remarks.

Results: (See attached sheets for results of competitive audit, formulations and coverage data.)

Improved COMINCO formulations all used asbestos 7R or 8S in place of asbestos 6D or 7R. Each formulation was varied, using regular wool and using granulated batt-trim. All wool used was triple granulated.

Formulations were changed on COMINCO #1 and COMINCO #2 to give a product which is cheaper, of better or comparable appearance, trowability, workability, and of comparable or better coverage and strength. Substituting asbestos 8S for asbestos 7R in COMINCO #3 produced a cheaper cement only slightly behind the existing material in performance.

The substitution of batt-trim, granulated, for wool in the new COMINCO formulations effects a considerable saving in raw material cost and an appreciable reduction in shrinkage. The use of batt-trim, however, has several serious drawbacks, among which are: the finished product, upon drying, may show purplish blotches caused by uncured resin in the wool; and when drying on a hot surface, a very noticeable characteristic phenolic odor may be present. In a material sold strictly for price these factors might not be a deterrent to the use of batt-trim.

Handwritten signature: Howard L. Clark

... per 100 pounds of dry material. ...
 ... March 24, 1959 only the following products
 meet the specifications:

COMINCO #1, Batt-Trim	43.8 lb./cu. ft.
COMINCO #3, New	47.4
COMINCO #3, Batt-Trim	45.9
A. P. Green	47.0

Most manufacturers have claimed dry coverages much in excess of any which could be obtained for their product in the conductance of this test.

According to Federal Specification HH-C-168, ASTM C-195-48, Navy 32C114h, Military MIL-C-2861, and Commercial Standard CS117-49, a maximum shrinkage of 20% is allowed. The audit of March 26, 1959 shows that only the following comply:

COMINCO #1, Batt-Trim	7.8% shrinkage
COMINCO #3, Batt-Trim	13.0%
Carey	12.1%
Ace	5.6%

Federal Specification HH-C-168 requires that the maximum density of an insulating cement as applied and dried be 27 pounds per cubic foot. Of the insulating cements tested only the following meet the specification:

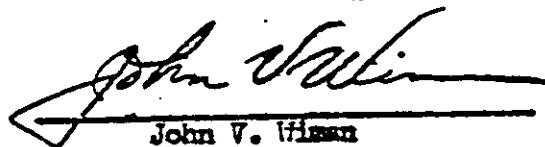
COMINCO #1, Batt-Trim	24.5 lb./cu. ft.
COMINCO #2, Batt-Trim	26.8
COMINCO #3	24.9
COMINCO #3, New	25.3
COMINCO #3, Batt-Trim	25.6
A. P. Green	25.5

Cons. ... COMINCO formulations are cheaper to produce than the ... products because cheaper materials have been substituted for the expensive ingredients. Asbestos 88 and 7R have been substituted for asbestos 7R and 6D. Borax, as a corrosion inhibitor, has been substituted for Mee-Rust. A complete series of tests has not been run on borax, but preliminary tests indicate that 1% of borax does a satisfactory inhibiting job. For a further and potentially very great saving granulated batt-trim can be substituted for granulated wool. Batt-trim in an insulating cement can cause discoloration and a phenolic odor upon drying if any un cured resin is present.

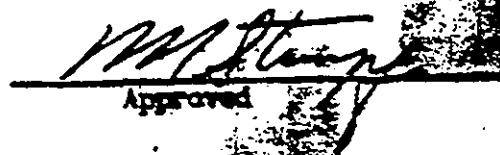
The new COMINCO formulations, although comprised of cheaper ingredients, have either superior or at least comparable characteristics such as coverage, trowelability, workability, and the batt-trim formulations.

...ally tested springs and springs subjected to
of waterproofing agents in the water and the
and change the characteristics of the same appreciably.

Of all the products tested only COMINGO #1, Batt-Frim, and COMINGO #2
Batt-Frim, completely meet Federal Specification RH-6-168 in all
requirements. No other manufacturer's product met the specification
according to our tests.



John V. Hiss
Research Department


Approved