

KAISER GYPSUM COMPANY, INC.
RESEARCH AND DEVELOPMENT DEPARTMENT
ANTIOCH, CALIFORNIA

PROJECT OUTLINE
December 5, 1973

TITLE: PREMIX JOINT COMPOUND FOR LOW TEMPERATURE APPLICATIONS

PURPOSE:

The primary objective of this research program is to develop and evaluate a joint compound, of the premix type, for interior drywall joint treatments which will exhibit a superior bond to all components under winter season conditions such as low temperature along with both low and high humidity. Other secondary, but nonetheless important, objectives may become apparent and desirable during the course of this work which, when identified, may be specified and approved for further investigation without detracting from or limiting the scope of the primary objective.

BACKGROUND:

It has been previously established that the current, widely-used formulations of premix type joint compounds for drywall construction, based on the familiar polyvinyl acetate type resin binder, do not always provide acceptable adhesion nor adequate bond strengths when applied to components under the seasonally encountered field conditions of low temperatures with both low and high humidities. This has precipitated numerous problems for the customer and user as well as product and monetary losses for the accessories manufacturer.

Certain development work and experience over the past three or more years has shown that the carboxylated styrene-butadiene type resins, when utilized as the primary binder in a premix formulation, do give greatly improved adhesion and bond properties under low temperature conditions. However, a possible drawback or limitation in performance had been observed in the commercially available S-B resins. These unmodified resins are more or less subject to oxidation and age-hardening over a period of time which results in a loss of flexibility and toughness and noticeable embrittlement. It has been demonstrated by the resin manufacturers that this characteristic has now been effectively overcome by the development and use of an antioxidant resin emulsion as a low-level additive/modifier for the styrene-butadiene resin.

Therefore, it is proposed that a premix joint compound be developed, utilizing an antioxidant-modified styrene-butadiene resin as the primary binder, and evaluated for low temperature bond properties on drywall components.

INITIAL GENERAL MATERIAL PARAMETERS:

1. Dow styrene-butadiene resin (Latex XD-8206, formulated).
2. Dow styrene-butadiene resin (Latex 209, not formulated, plus a dispersant/surfactant).
3. Other styrene-butadiene latex emulsions from other manufacturers.
4. Possibly latex emulsions other than styrene-butadiene type.
5. Dow antioxidant, Emulsion H, to minimize oxidation and age-hardening of S-B resins.
6. Limestone as a major filler component.
7. Raw gypsum, plant grind-premix grade, as a major filler component.
8. No asbestos component, if possible.
9. Mica and/or talc as minor constituents for shrinkage and cracking control.
10. Possibly clays or other miscellaneous fillers for workability characteristics.
11. Interior board and paper tape.
12. Possibly X-Terior wallboard and glass scrim tape for exterior applications.

INITIAL GENERAL PROCEDURAL PARAMETERS:

1. A premix paste, with adequate shelf life, storage stability, and mold resistance.
2. Total binder solids to pigment solids in the 6 to 7% range.
3. High solids and low shrinkage.
4. Acceptable workability and satisfactory application properties.
5. Tape joint bonds at room temperature (control).
6. Tape joint bonds at low temperature and high humidity.
7. Tape joint bonds at low temperature and low humidity.
8. Other standard product specification tests.