I would like to discuss some of the theory behind the coating of dry kilns, the various types of coatings, specific ingredients and their benefits in one type of coating, and the application of coatings. This afternoon, Protective Coatings, Inc., Portland, Oregon, will demonstrate proper application procedures with their most modern coating equipment.

Today we find dry kilns constructed from a great variety of different materials which include brick, poured concrete, cinder block, concrete block, metal prefab, tile, and wood. Yet each of these kilns require some type of coating, except for the metal prefab under favorable salt-water free conditions.

The purpose of a coating is to:

1) Establish a moisture barrier. Without this barrier, mortar joints are attacked by water vapor, which loosens the mortar bond. Any metal construction will rust and, in time, deteriorate to the point of replacement. The moisture would penetrate the porous poured concrete to the reinforcing bars; these will rust, causing sufficient pressure on the surrounding concrete to form hairline cracks. The cracks will grow with greater pressure, minute but inescapable kiln shifting, and possible frozen moisture in the cracks during winter - until the concrete commences flaking and/or dropping off.

2) Establish an acid barrier. Wood acids will attack the kiln similarly to moisture, with much greater severity.

3) Establish a heat barrier. A coating can provide definite fuel economy by reducing heat loss and resultant drying time through effective insulation.
There are a number of coatings available for dry kilns. They include aluminum and other epoxies, asphalt and coal tar emulsions, plastics, polyurethane, and asphalt cutbacks. Each has its own particular merit(s), but some have definite limitations when attempting to be an all inclusive moisture-acid-heat barrier.

The coating with which I am most familiar, is the Asphalt Cutback, which has been used effectively for years. The term, Asphalt Cutback, incidentally, describes the coating briefly as an asphalt base material, "cutback" or diluted with a solvent for ease of application.

The asphalt is called Petrolastic Asphalt, formed by bubbling oxygen through it in the refining process to impart oxidation resistance. This asphalt has been used extensively as a water proofing medium for countless different uses and serves well to resist the effect of water and acid in the dry kiln industry. It adheres tenaciously to the various types of kiln surfaces, and acts as a carrying agent for various other ingredients in the coating makeup.

A high quality asbestos is added for insulation, materially assisting as an effective heat barrier. Asbestos imparts a "bridging" characteristic as well, functioning to bridge the gaps or pores in the kiln wall during application. It also gives the coating an elasticity and tensile strength to resist the expansion and contraction of the coating due to varying temperatures. By adding asbestos, the sag resistance of the coating is greatly enhanced; a thicker coating film per square foot may be applied without the danger of sagging or sluffing.

Powdered mineral fillers, such as mica, slate flour, or bentonite, are used to give greater body to the coating and aid in insulation. These also aid in oxidation resistance due to the high kiln temperatures.

Solvent percentage is extremely important since too little solvent will inhibit a uniform spray pattern, and too much will promote sagging and deficiency in coating thickness after application.

A recent innovation has been the addition of a high viscosity lubricating oil extract to high temperature kiln coatings. This significantly increases the coating life under high temperature conditions, precluding the undue loss of the asphalt's natural oils. Protective Coatings, Inc., will demonstrate the high temperature material today.

"The quality and performance of a coating is directly related to the quality of preparation and application". This statement is extremely important - surfaces must be thoroughly clean by wire brushing, scraping, sand blasting, etc. Proper attention to repairing cracks and other imperfections must also be given before the coating application can effectively perform its functions.

We feel the professional specialized applicator fills a specific need in this area. A reputable applicator has the knowledge, experience, and proper equipment to prepare the kiln and apply the selected coating in the most effective manner. There are few people in the lumber industry who are qualified to carry out a first rate coating job on a dry kiln, even in the largest mills. Each year, thousands of gallons are applied by men pulled off their primary jobs, inadequately preparing the surfaces, using outdated equipment, and applying the coating in an unprofessional manner.

A final word - just as the average motorist is attuned to periodic oil changes and grease jobs on his automobile, as the least expensive type of maintenance, the dry kiln superintendent should also have a program of periodic scheduled inspections and regular coating by a qualified applicator. The great investment in dry kilns and their heavy usage easily justifies that the dry kilns remain in good working condition on a continuing basis.