EPOXY SURFACING AND COATING OF CONCRETE AREAS

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A properly formulated epoxy compound constitutes the best protective surfacing for concrete floors, new or old, for three very important reasons. Due to its molecular structure, it has the strongest adhesive strength of any product available today. After it has hardened it is extremely tough. It is so hard that it is difficult to machine on a metal turning lathe, so abrasion-resistant it will outlast steel on hard coal chutes. A third reason, important to the brewery industry, is its exceptional resistance to destructive chemical solutions and solids.

Another advantage that may be mentioned is its versatility. It will adhere to almost anything and can be given a wide range of finishes, from rough non-skid to a glass-like washable surface.

An epoxy surfacer is composed of a combination of epoxy resins and hardeners mixed with aggregates such as silica sand, granite chips, silica flour and other inert materials. The aggregates are used as fillers, adding to the bulk and making the surfacer economically feasible.

While the protective value of epoxy coating on concrete brewery floors has been well established for its long lasting ability to withstand water, acids and caustic solutions, some failures still occur. A large percentage of these are due to inadequate preparation of the concrete prior to application. Step-by-step procedures if followed, will assure long lasting epoxy protection, eliminating frequent and costly repair of concrete.

All deposits of dirt, asphalt, oils or greases must be removed before the final surface preparation. Mechanical means are best suited for this purpose, such as power grinder, sander or wire brush, aided by the use of grease cutting detergents, if necessary.

The surface of new concrete is always weak, even on good high strength concrete. The vibration and troweling movement made when placing the concrete encourages the lighter components, such as surplus Portland Cement and water, to rise to the surface. When this sets it is called "latence". It gives new concrete a typical and, unfortunately, appealing smooth appearance.

Latence is present to a depth of 0.05 inches or more and is almost universally extremely weak in its bond to the body of the concrete. Unless it is removed it will limit the performance and perhaps cause the failure of anything applied to its surface. This latence may well be present in old concrete floors as well as new floors. Removal can be accomplished by etching with strong acid followed by neutralizing with ammonia and thorough rinsing.

APPLICATION OF EPOXY SURFACER

In applying an apoxy surface, pre-measured amounts of epoxy and hardener are mixed thoroughly and aggregate (normally 2½ times bulk of epoxy) is added. Surfacing compound should not be applied in temperatures under 50 F. The mixed batch is dumped on the prepared surface and troweled to a desired thickness of 1/8 to 1/4 inch.

It is preferable to complete the entire floor but the epoxy material will bond together even after one section has completely set. A minimum set time of eight hours and a maximum of twelve hours before use is recommended, after which the surface may be washed with strong solutions or subjected to heavy weights. Damaged sections can be repaired at any time by patching without treating an entire area.

EPOXY SURFACER VS. EPOXY COATING

There may be some confusion between epoxy surfacers and epoxy coatings as protection for concrete floors. The primary difference is in the thickness and in the amount of protection provided. As outlined previously, an epoxy surfacer requires an aggregate of some kind to make it economical and give it body. It provides a covering surface of 1/8 to 1/4 inch overall (with even more thickness in deep holes and cracks). A finished surface of this kind will withstand heavy industrial weight and traffic as well as destructive chemical solutions and solids.

An epoxy coating normally is no more than 20 mils thick (20 thousandths of an inch) and has no aggregate filler. It will do an excellent job of protecting a concrete floor against erosion by water and chemicals. It is suitable for pedestrian traffic but not for heavy industrial traffic, impact and wear. It will not cover and hide holes, cracks and other sizable defects. (Holes may be filled with concrete, using an epoxy compound to bond them in.) It is good for laboratories, certain areas of dairies, animal hospitals and pens and so forth. It is the ideal protector and sealant for concrete block and may be pigmented for a wide variety of color finishes.

Epoxy coating may be applied by spraying, brushing, or roller coating and should be applied in a uniform thickness by whichever method is chosen. It should not be applied when floor temperature is below 50 F. For maximum results the liquid epoxy should be applied in a series of three coats, allowing not more than 24 hours to elapse between applications.

If a non-skid surface is desired as well, it may be easily obtained by broadcasting white silica sand, "sand blast grade" over the entire surface of wet coating during the application of the second coat. The sand should be applied freely, and the excess swept off when dry prior to the application of the third coat. The third coat should then be applied in the same manner as above.

ADDITIONAL PUBLICATIONS RECOMMENDED BY DAIRY FARM METHODS SUBCOMMITTEE

Some 200 pamphlets, brochures, bulletins and reprints published by various university and state extension services, departments of health and agriculture, and suppliers to the dairy industry have been reviewed by the Subcommittee on Education of the IAMFES Committee on Dairy Farm Methods. A number of these publications have been selected as being of interest to sanitarians and fieldmen and of value as educational and reference material.

It was the recommendation of the Subcommittee that this selected material be abstracted for publication in the *Journal* and this is the fifth in the series of abstracts. In the following abstracts the source of the material is indicated as well as the date of publication where available.

MASTITIS AND THE KANSAS MASTITIS CONTROL PROGRAM

This is a twelve page mimeograph release by the Kansas State University Extension Service and is designed to be a summary of facts and important points of concern in the control and elimination of mastitis. Pointing out that mastitis is the largest single economic loss to Kansas dairymen, cooperation is urged by all state agencies, county organizations and producing farmers. Suggestions are made for improved herd maintenance, milking practices and a comprehensive testing and eradication program. The mimeograph is well organized in material and supplies ample information for the producer and others involved in mastitis control.

A section on laboratory and therapeutic procedures undertakes to spell out the respective responsibilities of the herd owner and the practicing veterinarian in the detection of abnormal milk, testing and laboratory procedures, treatment and herd management to eliminate mastitis. Examples of C.M.T.-Production charts are included in the mimeograph.

RELATIVE IMPORTANCE OF PERSISTENCE, TRANSFER, AND MILKING MACHINE TECHNIQUE TO ANTIBIOTIC RESIDUE CONTAMINATION OF MILK

Originally published in the *Journal of the American Veterinary Medical Association*, Vol. 141, No. 2, July 15, 1962, this article is available as a six page reprint summarizing the results of a year-long study of the persistance of antibiotics in milk from treated cows. One of the purposes of the study was to determine the reasons for the presence of antibiotic residues in fluid milk supplies. In view of special emphasis on the labeling and use of antibiotic preparations, the relative importance of various conditions responsible for antibiotic residues was also evaluated. The article is technical in character and contains a number of tables developed from the test data to illustrate certain factors discussed in the text.

THE INSTALLATION, OPERATION, AND CLEANING OF FARM MILK PIPELINE SYSTEMS

This is a report of the Farm Practices Committee of the New York State Association of Milk Sanitarians and is reprinted from the 1959 Annual Report of the association. Recommendations are set forth for the installation of rigid pipelines including size, slope, risers, gaskets, hangers and brackets, filters and other factors. An accepted automatic cleaning system is outlined. Some uses for nonrigid transparent plastic tubing is discussed and physical factors are set forth for judging acceptability of such tubing.

Accompanying the report are two subsequent releases by interdepartmental committees for specific studies. The first covers pipeline milkers and in itemized form gives general principles of operation, design, installation, maintenance and inspection. The second study covers acceptability of C.I.P. com-