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Intra-company correspondence

to R. Shannon - Granville

from A.S. Kevlin - New York

date April 24, 1969

subject KYNOL

cc: D. Glosser - New York
J.S. Hearons - Toledo
J.P. Kern - New York
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Enclosed you will find an article on the subject which is a new fiber developed by Carborundum. Perhaps this is the solution to the asbestos replacement in Kaylo.

Initial costs of this fiber are high but when they get into full production the price will come down.

Looks like they are also going to get into the textile market.

Regards,

A.S. Kevlin

ASK:es
Encl.

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Terminal (near Houston) that can accommodate the new process. An expansion of 39 million lbs./year is now in startup stage. The new process operates at 500-600-psi. pressure. This contrasts with the 10,000-30,000 psi. needed in the conventional low-density process.

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A new way to apply colored coatings to glass containers was unwrapped this week at the American Management Assn.'s Packaging Exposition and Convention in Chicago. The new process, called Color Guard, is still under development at Glass Containers Corp. (Fullerton, Calif.). But it promises, says GCC, to be more economical than the use of colored glass (which requires special glass furnace runs or feeder melts). And it should cost considerably less than existing cold-color techniques, which typically cost $1/gross of container treated.

Color Guard puts a colored epoxy resin coating on the container at the cold end of the production line (after forming and annealing). The process can be used to apply colorless ultraviolet-light-screening coatings as well. GCC feels the method should cut the minimum economical production run in making colored containers. And it says the epoxy coat should protect the bottles from abrasion, increase lubricity—thus making them easier to handle on the filling line.

Color Guard will be well-suited to throwaway containers, says GCC. Returnable bottles may pose a big problem, because of degradation of the epoxy coating under the caustic soda wash used on returnables. Chemical development on the process was done by Stanford Research Institute. GCC is working on mechanical aspects (including alternative application methods) at its Knox, Pa., plant. It is not yet ready to estimate when the system will be ready for sale or license.

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A new porcelain enamel coating is being tested by Ferro Corp. (Cleveland). Of undisclosed composition, it is said to act catalytically to promote oxidation at temperatures over 300 F. Original testing centers on coatings for self-cleaning household ovens. But Ferro sees potential application in the CPI, is studying its performance under severe conditions.

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The chemical industry has improved its safety record slightly. The manufacturing Chemists' Assn. figures for '68: on frequency rate for disabling accidents, 3.27/million man-hours worked; for severity, 485 workdays lost (or charged as lost) because of injuries/million man-hours worked. The 3.27 and 485 compare with 3.3 and 524 in '67.

MCA's figures cover 115 reporting companies. Composite figures for all industry are not yet available for '68. MCA points out, however, that its figures on frequency have been consistently about one-half those for all-industry as compiled by the National Safety Council. The chemical industry figures leave no room for complacency, however. The frequency rate has not changed much over the past 10 years, so companies will have to work harder than ever to improve the industry standing.

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TECHNOLOGY Newsletter

CHEMICAL WEEK APRIL 19, 1969

A new high-temperature fiber is being introduced by Carborundum this week. It's Kynol, a phenolic said to combine some of the best features of inorganics (e.g., glass) and organics (e.g., nylon). For example, it can withstand oxidizing atmospheres of 300 F for extended periods. It is not bothered by exposure to an oxyacetylene torch for brief periods. (It eventually chars but doesn't burn.) And even under charring conditions, it retains shape and exhibits minimal shrinkage. Reason: in the burning process, the fiber becomes carbonized (60% yield). Moreover, the evolution of gases (steam and carbon dioxide) provides a layer of insulation and the carbon that's formed dissipates heat through radiation. At the same time, says Carborundum, the new fiber has good tensile strength (45,000 psi.), moisture regain (comparable to nylon), can be blended with other fibers (polyesters, wool, etc.), and shows excellent corrosion resistance.

It is now being made in "hundreds of lbs./week" lots but production will soon be on a "thousands of lbs./week scale." Kynol is selling for $5/lb. now, but the company sees no reason why it shouldn't eventually sell for less than $2/lb. Carborundum will not discuss chemistry except to say the product is amorphous (no X-ray pattern can be detected) and that the phenolic units are cross-linked in a novel manner. This leaves a number of doors open, of course. It may use a cross-linking agent like maleic acid, for example. In making phenolic resins, a number of hydroxyl groups are formed in the intermediate products. Addition of maleic (or similar cross-linkers) might produce a polymer that would give a desirable compromise between the rigidity required for strength and temperature resistance and the elasticity needed for a fiber.

Carborundum is looking at a number of markets. It thinks Kynol could find military applications. And it might be used for fire-fighting garments, filters or other industrial applications as well as in furnishings for institutions or the home. It is now being made as a 1½-in. (1.7 denier) staple fiber. Carborundum expects to have Kynol available eventually in different deniers, as crimped staple and as a continuous filament. One potentially important drawback is the dark color. Carborundum describes it as "golden hued." Samples shown, however, are rusty red. (Dark color is, of course, typical of phenolic resins.) So products are limited now to dark shades. Carborundum, however, reports some success in bleaching.

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A new low-pressure process for making low-density polyethylene has been successfully piloted by Phillips, is now being put through commercial paces. The method, says the company, is economical, can be used to make medium- and high-density polyethylene, as well as low-density material. This gives it a flexibility hard to match. Phillips developed one of the pioneering routes to high-density (low-pressure) polyolefins using a chrome oxide catalyst system. The new process, it says, employs a catalyst in the same family.

Phillips completed a 78-million lbs./year plant last year at its Adams

An organic fiber that boasts better flame resistance than any other textile material has been unveiled by Carborundum Co. It neither burns nor melts, and it even resists a 4,500 F. oxyacetylene flame for several minutes, before becoming a char with relatively small loss of volume. The charring reaction gives off gases that are noncombustible (such as carbon monoxide, carbon dioxide and water vapor), which in effect ablatively protects the unexposed layers of fiber. What's more, the material is inert to almost all organic solvents and nonoxidizing acids.

Called Kynol, the fiber consists of phenolic units "cross-linked in a novel manner." At present, it is available in its natural deep-copper color, or dyed into deep colors including red, blue or green; Carborundum hopes to also find ways to impart pastel shades. The company is selling the fiber as 1½-in.-long staple with a 14-micron dia., and intends to also bring a crimped staple and a continuous-filament yarn to market within the coming year. Conditions are now being established for processing the fiber on various kinds of textile equipment. Carborundum thinks that at high-volume consumption, the cost will be in the range of low-price synthetic fibers. The material might not only be used alone but also as a blend with other fibers, including cotton or wool.

A wide range of applications has been suggested, from aircraft insulation to corrosive-liquids filtration, to protective industrial clothing, to blankets and drapes for institutions or homes.