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LOG OF MEETING

DIRECTORATE FOR ENGINEERING SCIENCES

1998 MAR -5 A 10:30

SUBJECT: Flammability Tests of Pyrovatex-treated Flame Resistant Fabrics

DATE OF MEETING: January 21, 1998

DATE OF LOG ENTRY: February 11, 1998

SOURCE OF LOG ENTRY: Margaret L. Neily, *MM* ESME

LOCATION: CPSC, Room 410 A, East West Towers, Bethesda, MD

CPSC ATTENDEES: Margaret Neily, ESME, and others. See attached list of CPSC attendees.

NON-CPSC ATTENDEES: See attached list of attendees.

SUMMARY OF MEETING: In preparation for updating the laundering/detergent requirements for several Flammable Fabrics Act standards, the CPSC staff tested flame resistant children's sleepwear fabrics after laundering with AATCC 124 (with phosphate and non-phosphate built standard detergents) as well as common household powder and liquid non-phosphate detergents. Fabrics treated with Pyrovatex CP new (Pyrovatex) showed poor flame resistance after laundering with powder non-phosphate detergents.

Ciba Specialty Chemicals representatives reported on their follow-up work to further evaluate the impact of laundering on fabrics treated with Pyrovatex. This study focused on knitwear, although primary uses of Pyrovatex are in workwear and home furnishings. Douglas Parks outlined a number of factors that affect the durability of this flame retardant including product quality, application level, processing steps, other finishing components, fabric weight, fiber content, print coverage, fabric style, fabric/garment care. Chlorine bleach, acid sour rinse, storage at high temperature and humidity can degrade the treatment. Fabric softeners, soap-based detergents, and flammable finishes/prints can render the treatment ineffective.

In order to determine the affect of product care on sleepwear fabrics, Ciba conducted a number of flammability tests. Interlock and 1x1 rib knits and heavier cotton terries were included. Test conditions included unwashed and after 50 laundering with non-phosphate detergents: AATCC 1993, a powder detergent for baby products, a powder concentrate and a liquid concentrate with bleach. The phosphorous levels remained durable to the washing process; however, increases in calcium and magnesium were detected. The interlock knits performed unsatisfactorily with the powder concentrate; rib knits also showed increased char lengths over 3 inches. Cotton terries



maintained very short char lengths under all of these wash conditions. Further tests with the terry fabrics, however, confirmed the adverse affects of laundering with products containing chlorine bleach and of fabric softener added to the rinse cycle.

Ciba Specialty Chemicals has no control over the application process used to apply Pyrovatex (they only sell the chemical) or other care factors that adversely impact the flame resistance of garments in use. With the lighter weight fabrics typically used for sleepwear, there is little room for error. Because of this, the company decided it is prudent to stop marketing Pyrovatex to the sleepwear industry (with one exception, a terry fabric over which they have acceptable control). Ciba plans to publish the results of this study.

ATTENDANCE

**Ciba Specialty Chemicals
Tests of Pyrovatex-treated FR Fabrics
under the Children's Sleepwear Flammability Standard**

January 21, 1998

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