PROJECT:

PATZIG TESTING LABORATORIES CO., INC.
515/266-5101 3922 DELAWARE AVENUE
DES MOINES, IOWA 50313

LAB. NO. 224068

DATE February 23, 1987

TO Minnesota Mining and Manufacturing
Energy Control Products
3M Center, Attn: Gary Svenningsen
Building 207-1W-08
St. Paul, Minnesota 55144

TESTS ON Scotch Tint Scratch Resistant Film
SUBMITTED BY Above
SENDER'S NO. P.O. T-854737-410 MARKED
DATE RECEIVED 2/12/87 DATE TESTED 2/18/87 BY EAM/BAM

Samples of clear scratch resistant film were tested for abrasion resistance in accordance with ASTM D-1044.

Abrasion Resistance

Three 4x4 inch flat specimens were subjected to abrasion by means of a Taber Abraser with a load of 500 grams on each CS-10F Calibrase Wheel for 100 cycles and operated in accordance with the code procedure.

Haze measurements were made in accordance with code procedure before and after subjecting the specimens to abrasion, by means of a Pivotable-Sphere Hazemeter.

From the required measurements, the light scattered as a result of abrasion was computed in accordance with the code procedure.

Results

Specimen Number	% Haze Before Abrasion	% Scattered Light and Haze After Abrasion	% Light Scattered From Abrasion
NR 35 SMARL-1	2.6	4.6	2.0
NR 35 SMARL-2	2.6	4.6	2.0
NR 35 SMARL-3	2.6	4.6	2.0
		Arithmetic Mean	2.0
RE 35 NEARL-1	2.3	4.7	2.4
RE 35 NEARL-2	2.3	4.4	2.1
RE 35 NEARL-3	2.3	4.6	2.3
		Arithmetic Mean	2.3

-Continued-

Specimen Number	% Haze Before Abrasion	% Scattered Light and Haze After Abrasion	% Light Scattered From Abrasion
P-18 AR-1	1.2	3.7	2.5
P-18 AR-2	1.5	4.0	2.5
P-18 AR-3	1.2	4.0	2.8
		Arithmetic Mean	2.6

Respectfully submitted,

PATZIG TESTING LABORATORIES CO., INC.

Byron A. Marks

Byron A. Marks, P.E.

BAM/cjb

3 XC Above

Abrasion Resistance Test

Samples of **Scotchtint**™ NR35SMARL, RE35NEARL, and P-18AR were submitted to Patzig Laboratories for independent testing of the window films abrasion resistant coating. These products represent all of the various constructions to which abrasion resistant coatings are applied and are therefore judged to be representative of all **Scotchtint** or **Scotchshield**™ products currently being manufactured. In addition, the abrasion resistant coating applied to these products is identical to the abrasion resistant coating applied to all other **Scotchtint** and **Scotchshield** window films. It is our opinion, therefore, that other products, if tested, would exhibit the same performance characteristics.