



ESTABLISHED 1802

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**WHITE
PAPER**

Watermarking

"Watermarking" is an optical effect caused by an irreversible change in pile orientation in apparent random areas in a cut pile carpet. Routine vacuuming or steam cleaning will not permanently change the pile orientation in the watermarked area. In these areas, the carpet looks dark or wet when viewed from certain directions, and has a distinctive irregular border. Watermarking has been a recognized phenomenon for over fifty years and has been studied by many of the major textile research institutes worldwide.

Although much of the research on watermarking has yielded inconclusive results due to the random nature of the phenomenon, it is generally conceded that the mechanism of watermarking is not known. There are other generally accepted observations about watermarking:

- It occurs in cut pile constructions.
- It occurs over pad and direct gluedown but starts sooner on gluedown.
- It occurs in contract and residential styles, broadloom and tiles, woven, tufted and hand-knotted constructions.
- A watermark in tile A can and will propagate across a tile boundary into tile B.
- It is observed on all fiber types (wool, nylon, polyester, etc.) and on fibers of any denier or cross-section.
- It is common to all dye systems, all heatsetting systems and all tufting techniques (straight tuft or stepover).
- It is usually noticeable within 5-6 months of installation but may be seen as soon as 2-3 weeks.
- It is not high-traffic-related and not consistent with traffic patterns.
- It occurs randomly and can migrate from a traffic area to a non-traffic area like a "domino" effect. It has been observed under beds, furniture and the like.
- It is not to be confused with the texture loss associated with traffic lines.
- An uneven subfloor (non-level areas) may speed up the initiation of watermarking.
- We know of no in-place treatments which will permanently cure the problem.

We at Du Pont have a continuing research effort focused on determining the cause and cure of watermarking. Additionally, we keep abreast of all research in the area, both nationally and internationally, through research publications and presentations, and we maintain close contact with international research institutes with ongoing programs on watermarking. Since watermarking is common to all fiber types and thus cannot be considered a fiber related problem, Du Pont does not guarantee that carpets made from our fibers will not watermark.