

## Slight Crocking Acceptable

# Rub Fastness of Footwear Materials

***Crocking of footwear materials – particularly of materials used on the inside of footwear such as linings, socks, and the inward-facing sides of leather uppers in the case of unlined shoes – and the resulting complaints constitute a frequent challenge for the footwear industry. It should be noted that rub fastness is concerned not only with crocking, but also with changes to the material surface (such as the surface finish) in general.***

Materials used inside footwear are exposed to the effects of perspiration in conjunction with mechanical friction to a far greater extent than any other materials worn on the body. Particularly in the case of very strongly dyed leathers it is almost inevitable that stains will appear on the stockings or feet of the wearer.

Leather is often more prone to crocking than textiles and man-made materials. That is because leather has to be dyed with other dyestuffs and by other techniques than are used for textiles or synthetics. At the present state of the art it is not yet possible to attain a degree of colour fastness that can completely withstand the conditions prevailing inside shoes. The consumer therefore has no alternative but to accept a certain amount of crocking, but definitely not all degrees of the phenomenon.

The minimum quality standard for footwear materials on testing for rub fastness in the dry and in the wet state and on application of artificial perspiration solutions is generally set at Grade 3 on the grey scale, corresponding to a very low degree of crocking. There are five levels on the grey scale: Grade 5 corresponds to no crocking at all and Grade 1 to very pronounced crocking. Thus these minimum quality standards tolerate a certain degree of crocking. Tests at PFI are conducted according to the following standards:

- DIN EN ISO 11640
- [DIN EN ISO 17700](#) Method A
- DIN EN ISO 20433
- Method analogous to DIN EN ISO 105-X12 (for textiles)

A more intense transfer of colour is observed in the case of strongly perspiring feet than with dry feet. The intensity of perspiring differs greatly from person to person and can also vary widely for the same person under physical and psychological strain.

Not only crocking but also changes to the surface (marring) are assessed in the testing of footwear upper materials. If the surface loses its colour during rub fastness tests, leaving a lighter patch on the

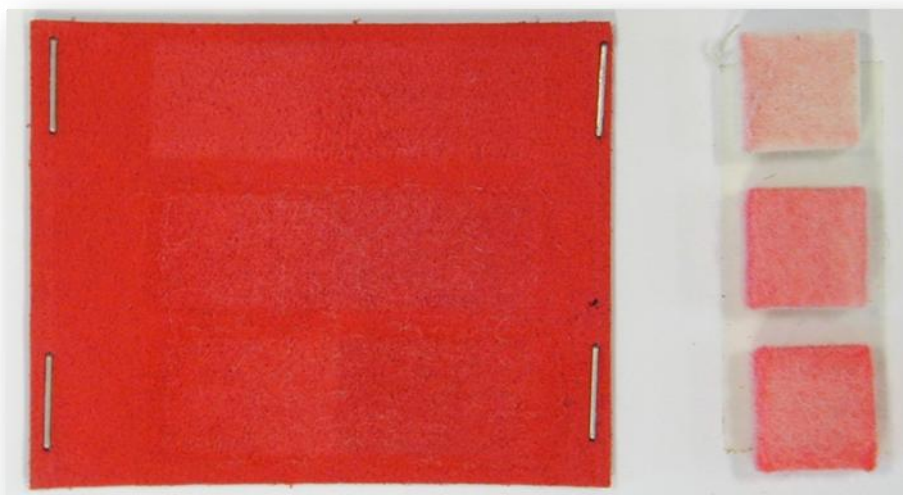
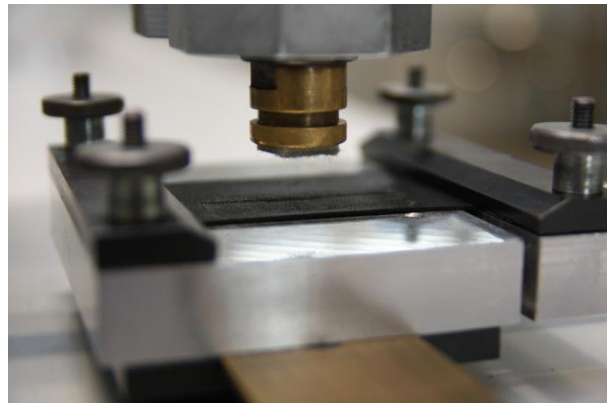
material, or if the finish is damaged, the material can essentially be described as “colour fast” yet not without impairment of the optical properties, which in turn constitutes a quality defect.

Conclusion: At the present state of the art, a certain degree of crocking has to be accepted. Ideally, attention should already be paid to the topic of crocking by appropriate choice of materials in the design phase in order to avoid subsequent customer complaints. Moreover, the consumer should be clearly informed that a slight degree of crocking of footwear materials is deemed acceptable and thus does not constitute grounds for complaint.

Please address any further questions to:  
Dipl.-Ing. (FH) Liselotte Vijselaar  
Head of the PFI Physical Test Laboratory  
Tel.: +49-(0)6331 – 2490 12,  
E-Mail: [liselotte.vijselaar@pfi-germany.de](mailto:liselotte.vijselaar@pfi-germany.de)



**Rub fastness tester**



**Specimen – Colour fastness to rubbing:**

- 1. Felt dry**
- 2. Felt wet**
- 3. Felt at pH8 (synthetic perspiration)**