

Contact dermatitis due to Nyloprint

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The Nyloprint process is becoming more frequently used in Great Britain. We report a case of contact dermatitis in a 60-year-old man who was employed in the production of Nyloprint formes. The process is described in detail. Patch tests showed him to be very sensitive to an acrylamide derivative, which is used as a monomer in this process.

Key words: acrylamide derivative – Nyloprint – occupational dermatitis.

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In recent years 'Nyloprint' has tended to replace some of the more conventional methods of printing in this country.

The Process

The Nyloprint plate consists of a photo-sensitive plastic which is firmly joined to a metal plate. The plastic consists mainly of polyamide together with a polymerisable monomer, photo-initiators and other chemicals which, when exposed to ultra-violet light, stimulate polymerisation of the monomer. The plate is shielded from ultra-violet light before use.

In order to produce a Nyloprint block, a photographic negative of the original to be reproduced is applied to the plastic surface of the Nyloprint plate, and is exposed to ultra-violet light produced by a bank of fluorescent light tubes. The ultra-violet light exposure causes polymerisation of the monomer in the parts of the plate which are not shielded by the photographic negative.

The exposed plate is then transferred to a closed cabinet washing machine, where an ethanol/water mixture at about 30°C is sprayed on to the Nyloprint surface. This dissolves out the non-polymerised plastic,

but has no effect on the polymerised Nyloprint, thus producing a relief positive of the original negative. The concentration of dissolved Nyloprint in the ethanol/water mixture gradually increases and, eventually, the solvent has to be replaced.

The time required for washing depends on the temperature, the concentration of dissolved Nyloprint in the solvent, and the depth of relief required. The plates are removed from the cabinet by hand and are dried, at first, manually with absorbent paper, and then in a drying cabinet.

Case Report

A 60-year-old man, who had been employed in the production of Nyloprint formes for five years, developed dermatitis on his fingers, hands, wrists, and forearms with some involvement of his face. Although gloves were provided by the firm, he found these unsuitable for handling the wet and slippery plates, and usually removed these plates from the washing cabinet with his bare hands.

The patient was patch-tested to unexposed Nyloprint plastic, Nyloprint plastic that had been exposed to ultra-violet light, unused

solvent, and used solvent. In addition, the various constituents of Nyloprint were supplied by the manufacturer (B.A.S.F.) under code, and each dissolved in an ethanol/water mixture in a concentration equivalent to that in a saturated washout solution containing 4 % of Nyloprint.

Results of patch testing were as follows:

	48 hours	96 hours
Unexposed Nyloprint	+++	+++
Exposed Nyloprint	—	—
Unused solvent	—	—
Used solvent	+++	+++

Coded constituents of Nyloprint:

	48 hours	96 hours
1. Polyamide	—	—
2. Glycol amol (Acrylamide derivative)	+++	+++
3. Photo initiator A	—	—
Photo initiator B	—	—
4. Pigment	—	—
5. K-Salt (Inhibitor)	—	—
6. M-Dinitrobenzene	—	—
7. Glycol	—	—
8. Plasticizer	—	—
9. Ethanol/water/MEK	—	—

Ten control patients who had never worked with Nyloprint were patch-tested to all the above samples, and had completely negative results.

Discussion

Although the full chemical formulae for the constituents of Nyloprint have not been disclosed by the manufacturer, we have been informed that 'Glycol amol', to which our patient was strongly allergic, is the monomer and is an acrylamide derivative.

Wahlberg (1974) patch-tested five out of six patients who were found to be allergic

to Nyloprint, and noted that his patients were sensitive to the used solvent and also to either one or two of the undisclosed constituents of the Nyloprint.

Tilsley (1975) has recently reported a further patient from Tasmania, who was allergic to both unexposed and exposed Nyloprint, and also showed features of photo-dermatitis. Patch tests to the various constituents of Nyloprint were not performed.

Magnussen & Mobacken (1972) described similar cases of sensitivity caused by 'Dy-cril' printing plates, which also contain a light sensitive acrylic monomer. In this process the unpolymerised portions of the plates are dissolved away by spraying with dilute sodium hydroxide. Four workers were shown to be allergic to the unexposed plastic, and one of two tested was allergic to the exposed plastic.

Patch tests to methyl methacrylate were not performed in our patient, but were negative in Wahlberg's and Magnussen & Mobacken's patients. The latter authors also patch-tested one patient to four other acrylic monomers with negative results.

Jordan (1975) has shown that patients who are allergic to some acrylic monomers may not react to patch tests with methyl methacrylate, and that this is not adequate as a screening test for sensitivity to the many acrylates used commercially.

Although Nyloprint printing is now widely used in Great Britain, there have been no previous reports of Nyloprint sensitivity in this country. A postal survey of four other printing firms in the Bristol area, who use the Nyloprint process, showed that there had been no cases of dermatitis amongst the total of ten workers concerned with producing the Nyloprint formes.

References

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