

# **Government Product Safety Policy Statement on Acceptable Limits of Formaldehyde in Clothing and Other Textiles**

**July 2008**

## **Introduction**

This government product safety policy statement sets out the limits of formaldehyde in clothing and textiles considered acceptable by the government.

The government product safety policy statement is intended to provide clear guidance to manufacturers and importers as to acceptable limits of formaldehyde. It is intended to complement the Consumer Guarantees Act by setting out what is considered acceptable quality and fit for purpose. The Consumer Guarantees Act guarantees to a consumer that goods must be of acceptable quality and fit for the particular purpose for which they are supplied, including that products must be safe to use.

Voluntary compliance with the policy statement will be monitored by the Ministry of Consumer Affairs Measurement and Product Safety Service. The Ministry will not have the power to take enforcement action under the Fair Trading Act if a breach with the guidance is identified. However, any evidence of failure to meet the limits set out in the policy statement will support the need for mandatory regulation under section 29 of the Fair Trading Act 1986 or even a product recall or ban under sections 31 and 32 of the Act.

## **Acceptable Limits of Formaldehyde in Clothing and Other Textiles**

Formaldehyde limits considered acceptable in clothing and textiles are as follows -

- For clothes for babies and infants under 2 years of age: no greater than 30ppm (30mg/kg);
- For clothing specifically designed and marketed as for people (both children and adults) with sensitive skin or to avoid any sensitive reaction with skin: no greater than 30ppm (30mg/kg);
- For clothing and textiles in direct contact with skin: no greater than 100ppm (100mg/kg), or no greater than 100ppm (100mg/kg) after wash if there is a label or instruction recommending to “wash before first use”;
- For clothing and textiles not in direct contact with skin: no greater than 300ppm (300mg/kg).

A product is deemed to be in direct contact with skin if a large proportion of its surface comes into direct skin contact when used as intended (e.g. shirts, underwear, bed linen). A product where no part or a small proportion of its surface comes into direct skin contact is deemed to be not in direct contact (e.g. jackets, curtains, rugs).

The acceptable testing method is EN ISO 14184-1:1999 Textiles – Determination of Formaldehyde – Part 1: Free and Hydrolyzed Formaldehyde (Water Extraction Method) which is the internationally recognised standard for testing of formaldehyde in clothing.

## Explanation

### ***Why a government product safety policy statement***

As noted, the government product safety policy statement is intended to provide clear guidance to manufacturers and importers as to acceptable limits of formaldehyde without the need for regulation, and is intended to complement the Consumer Guarantees Act by setting out what is considered acceptable quality and fit for purpose.

There is no regulation of formaldehyde or other chemicals in clothing and textiles and there is no evidence to suggest that regulation is needed. However, there have been a number of possible product safety scares. These have identified that in some areas there are not clear guidelines about what are acceptable product safety standards.

### ***Some background on Formaldehyde***

The Australian National Industrial Chemicals Notification and Assessment Scheme<sup>1</sup> has identified that the critical health effects of formaldehyde exposure from any sources are:

- sensory irritation via inhalation exposure to formaldehyde gas (vapour), aerosol or mist;
- skin sensitisation following dermal exposure to formaldehyde solutions; and
- carcinogenicity via inhalation exposure to formaldehyde gas (vapour) or mist.

Formaldehyde is classified as a hazardous substance under the Hazardous Substances and New Organisms Act having a number of hazardous properties, including skin and eye irritation, skin sensitisation and carcinogenicity.

Formaldehyde resin products used in the textile industry include printing inks, dyes and textile finishing products. The concentrations of free formaldehyde in these products are generally less than 2%<sup>2</sup>. These formaldehyde-based materials help bind dyes and pigments to fabrics, prevent colours from running, improve a fabric's resistance to wrinkles, ease clothing care and maintenance and prevent mildew<sup>3</sup>.

Formaldehyde is also used, at low levels, in a variety of cosmetic and consumer cleaning products, in some medicines and dental products, and in some bank note paper. It is found in outdoor ambient air from combustion processes related to vehicles and from industry emissions. It is found in ambient indoor air from sources such as pressed wood (e.g., particle board), cooking and heating appliances and tobacco smoke.

### ***Scientific studies of acceptable levels of formaldehyde in clothing and other textiles***

The adverse health effects from formaldehydes in textiles are likely to be skin irritations related to "free or easily hydrolyzable (reacts with water) formaldehyde<sup>4</sup>." However, the threshold level of formaldehyde on garments that will produce dermatitis is not known<sup>5</sup>. Neither is the reaction threshold for already sensitized subjects.

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<sup>1</sup> Australian Government, Department of Health and Ageing, National Industrial Chemicals Notification and Assessment Scheme, Priority Existing Chemical Report No.28. Formaldehyde, November 2006.

<sup>2</sup> Australian Government, Department of Health and Ageing, National Industrial Chemicals Notification and Assessment Scheme, Priority Existing Chemical Report No.28. Formaldehyde, November 2006

<sup>3</sup> <http://www.formaldehyde.org/formaldehyde/common.html>

<sup>4</sup> Scheman, A.J., Carroll, P.A., Brown, K.H., & Osburn, A.H., (1998) "Formaldehyde-related textile allergy: an update" *Contact Dermatitis*, 38, 332-336

<sup>5</sup> Hatch, K.L., and Maibach, H.I (1986) "Textile chemical finish dermatitis" *Contact Dermatitis*, 14, 1-13

From the few studies located in recognised scientific journals, the suggestion is that only a very few people (1-4%) are sensitive to formaldehyde concentrations of 1-2% and higher (10,000ppm-20,000ppm). For sensitised people, studies show decreasing reactions with decreasing formaldehyde concentrations but that even 30ppm may elicit a reaction, if only rarely, in some already sensitized subjects.

The Australian National Industrial Chemicals Notification and Assessment Scheme<sup>6</sup> review notes that the European Union (EU) Expert Group on sensitisation categorised formaldehyde as a strong skin sensitiser. The review indicates that formaldehyde solutions can induce skin sensitisation at very low concentrations and may elicit a dermatological reaction in individuals who have been sensitised. The skin sensitisation noted occurs from exposure to formaldehyde solution rather than to gaseous formaldehyde.

### **Acceptable Limits**

The basis for the government product safety policy statement on acceptable limits of formaldehyde in clothing and other textiles is an assessment of the scientific studies regarding sensitivity to formaldehyde and limits in place in other jurisdictions as below.

### **International formaldehyde limits in clothing and other textiles (parts per million (ppm))**

Austria	Textiles that contain 1500ppm or above must be labelled
China	Textiles for infants and babies ≤ 20ppm Textiles in direct skin contact ≤ 75ppm Textiles not in direct skin contact ≤ 300ppm
Finland and Norway	Textiles for babies under 2 years: 30ppm Textiles in direct skin contact :100ppm Textiles not in direct skin contact: 300ppm
France	For products intended to come in contact with human skin – Textiles for babies: 20ppm Textiles in direct skin contact :100ppm Textiles not in direct skin contact: 400ppm
Germany	Textiles that normally come into contact with the skin and release more than 1500ppm formaldehyde must bear the label “Contains formaldehyde> Washing this garment is recommended prior to first time use in order to avoid irritation of the skin.”
Japan	Textiles for infants: not detectable (20ppm) Textiles in direct skin contact :75ppm
Netherlands	Textiles in direct skin contact must be labelled “Wash before first use” if they contain more than 120ppm formaldehyde and the product must not contain more than 120ppm after wash.

There is also a voluntary New Zealand Eco-labelling Trust “Textiles, Skins and Leathers” labelling standard. Its requirements are “the amount of free and partly hydrolysable formaldehyde in the final fabric shall not exceed 30ppm for products that come into direct contact with the skin, and 300ppm for all other products”. This eco-label is identical to European and other international eco-labels<sup>7</sup>.

<sup>6</sup> Australian Government, Department of Health and Ageing, National Industrial Chemicals Notification and Assessment Scheme, Priority Existing Chemical Report No.28. Formaldehyde, November 2006.

<sup>7</sup> Eco-labelling is a voluntary method of environmental performance certification and labelling that is practised around the world. An eco-label is a label which identifies overall environmental preference of

The international regulated limits of formaldehyde in clothing and textiles show a fairly diverse spread. Japan has the most stringent limits, essentially no formaldehyde in baby and infant clothing and 75ppm for clothing in direct contact with the skin.

European laboratory experiments have shown that a level of 10 or less ppm formaldehyde in new infants clothing can be attributed to background formaldehyde levels that are not related to any textile finishing application. The European Union argues that a result between 10ppm and 20ppm allows for a qualitative statement about the presence of formaldehyde to be made, but only above 20ppm can quantitative information be given. Accordingly, in the European Union, if testing suggests below 20ppm then a zero level of formaldehyde is assumed. The European Union has noted that as other substances (including other aldehydes) give the same analytical response, only more expensive tests can assure that there are no disputes (exclusion of false positives). For that reason, and to avoid disputes, a test result of less than or equal to 30ppm is considered by the European Union as an acceptable lower limit.

This advice probably explains why Finland and Norway use this lower limit for textiles and clothing for babies under 2 years old and the very stringent eco-label has a lower limit of 30ppm detectable formaldehyde in textiles and clothing in direct contact with skin.

For textiles in direct contact with skin (children and adults), France, Finland and Norway have limits of 100ppm and the Netherlands 120ppm. For textiles not in direct contact with skin, Finland and Norway have limits of 300ppm and France 400ppm. The eco-label has a limit of 300ppm. These limits appear to be based on the scientific studies that indicate it is very rare for even sensitised subjects to have a reaction to formaldehyde below 100ppm; and reactions are rare also below 500ppm. The Netherlands provides that textiles designed for and labelled wash before use can meet a post wash test of 120ppm.

The New Zealand limits of 30ppm for clothing and textiles for babies and infants under 2 years of age and for clothing specifically designed for both children and adults with sensitive skin or to avoid any sensitive reaction with skin recognises the European Union advice, and the European and eco-label standard.

The New Zealand limits of 100ppm for clothing and textiles in direct contact with skin or 100ppm after wash if there is a label or instruction recommending "wash before first use" recognises a number of the European countries limits. It also recognises the approach adopted by the Netherlands of allowing for items which meet safe limits after an initial wash.

The New Zealand limits of 300ppm for clothing and textiles not in direct contact with skin recognises a number of other jurisdictions limits and the eco-label standard limit.

## **Testing Method**

The acceptable testing method is EN ISO 14184-1:1999 Textiles – Determination of Formaldehyde – Part 1: Free and Hydrolyzed Formaldehyde (Water Extraction Method) which is the internationally recognised standard for testing of formaldehyde in clothing. This is a method for determining free formaldehyde and formaldehyde extracted partly through

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a product or service within a specific product/service category based on life cycle considerations. In contrast to "green" symbols or claim statements developed by manufacturers and service providers, an eco-label is awarded by an impartial third-party in relation to certain products or services that are independently determined to meet environmental leadership criteria New Zealand's eco-label is "Environmental Choice New Zealand" which is endorsed by the government. To qualify for an eco-label a product must also pass a spectrum of other tests (including aromatic amines) along with falling within the detailed formaldehyde limits. To display the label, manufacturers are required to pay annual licensing fees. There are no textile products currently certified to use the label. The New Zealand eco-label scheme is part of the Global Eco-labelling Network.

hydrolysis (reaction with water) by means of a water extraction method. The procedure is intended for use in the range of free and hydrolysed formaldehyde on the fabric between 20ppm and 3500ppm. Below 20ppm the result is reported as 'not detectable'.

This is the standard testing method used internationally for testing to textile formaldehyde standards. It tests for free formaldehyde on the basis that adverse health effects from formaldehydes in textiles are likely to be skin reactions to "free or easily hydrolyzable (reacts with water) formaldehyde.

### **What does this mean for business**

The expectation is that suppliers and retailers will take measures to assure themselves that clothing and other textiles meet the guidance set out in the Government Product Safety Policy Statement on Acceptable Limits of Formaldehyde in Clothing and Other Textiles. This may be in the form of asking for assurances from international and local suppliers of clothing and textiles through to undertaking their own quality assurance testing. Businesses may wish to consider using general labels or instructions on products to "wash before first use", where appropriate.

### **What consumers can do**

It is good practice for new, washable garments and manchester to be thoroughly washed and aired, if possible outside, before use, and for new clothes labelled as "dry-clean only" to be thoroughly aired before use. The Government Product Safety Policy statement also provides clear guidelines that can be used to ask for assurances from retailers about formaldehyde in clothing or manchester, if a consumer has any concern.

Hon Judith Tizard  
Minister of Consumer Affairs