EUROPEAN COMMISSION
JOINT RESEARCH CENTRE
Institute for Health and Consumer Protection
Toxicology and Chemical Substances Unit

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HEEG Opinion on the assessment of Potential & Actual Hand Exposure

Agreed at TMI08

1) Background

The discussion on potential exposure of professionals handling wood preservatives was initiated at TMI07 based on a document prepared by DE. The item was discussed also at TMII07 and TMIII07 but no agreement was reached on how to assess potential hand exposure when there is data available from actual hand exposure (measured underneath protective gloves).

In one occasion, during the assessment of potential hand exposure for one wood preservative, the SAIC (or CEB) method was used to bridge the data gap using literature data for deposition of product on skin. According to this method, data from immersion of hands into liquids of different viscosity is used.

It has now been identified that the conversion of potential hand exposure to actual hand exposure and vice versa is not a product type specific issue but applies to all product types.

Therefore the Human Exposure Expert Group was asked to prepare a paper in order to have one harmonised approach on this issue regarding the use of default values for exposure reduction when gloves are used, that will be used in the Competent Authority Reports.

2) Opinion of the HEEG

When performing dermal exposure assessment two cases can be identified with respect to the data available:

a) **Data on potential hand exposure is available**

b) **Only data on actual hand exposure (measured underneath protective gloves) is available**

The Human Exposure Expert Group discussed how the potential hand exposure should be assessed depending on the availability of data. In general reduction of exposure with the use of gloves is between 90-99% (1-10% penetration through gloves).

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a) It has been agreed that when **potential hand exposure data** are available a factor of **10** (90% reduction of exposure by gloves manufactured from appropriate material[1]) can be used as a reasonable and conservative default value to convert the potential to actual hand exposure when using appropriate gloves (the type of gloves is not taken into account) (divided by 10). In many cases it is also assumed that the worker has a good occupational hygiene approach in his behaviour and uses gloves with long sleeves, where appropriate, to prevent exposure via the openings around the wrists. It is also assumed that taking off the gloves is done carefully without touching the outside of the contaminated gloves with bare hands.

b) In the case that only **actual hand exposure data** are available, in general, it should not be attempted to convert it to potential hand exposure. The data for actual hand exposure can be used for the exposure assessment with the provision that the users will have to wear gloves. This approach needs to be followed in the case of products that cause skin irritation and/or sensitisation and warrant the wearing of gloves. Provided that there is sufficient justification, if actual hand exposure data needs to be converted to potential hand exposure (e.g. when actual hand exposure data is available and the same scenario needs to be used for the assessment of a less toxic substance or no gloves can be used) a multiplication factor of **100** should be used for the conversion of actual to potential hand exposure.
In case there is data available in the model with respect to the use of new gloves, a lower percentile and the data on new gloves may be used. This will be a case by case decision.

Different factors are assumed in order to keep a conservative approach in the two directions of estimation (potential to actual or actual to potential). The factor of 10 (in section **(a)** corresponds to 90% protection by gloves whereas the factor of 100 (in section **(b)** correponds to 99% protection.

c) With respect to bridging data gap using literature data for deposition of product on skin: the **SAIC (or CEB) method,** the HEEG agreed that this method of assessing potential hand exposure has certain disadvantages and therefore <u>should not be used</u> for the conversion of actual hand exposure to potential hand exposure:

- The method is a very conservative approach based on limited data. The method is integrated in the dermal exposure assessment of EASE and has proven to be over conservative and unrelated to real exposures.
- The method is only valid for liquids
- By using this method the model needs to be changed and therefore follow a different approach for the assessment of hand and body exposure
- The assessment of the deposit rate (data ranges between 1-14 mg/cm^2 skin) is always a case by case decision based on expert judgment.

[1] Default value found in TNsG on human exposure version 2 page 20.