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APPLICABILITY OF SCREENING (TIER-1) EXPOSURE ASSESSMENT TOOLS

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PRESENTATION OBJECTIVE

To invite the Occupational Hygiene community to :

- *Understand the relevance of Tier-1 exposure assessment tools in chemical management systems*
- *Contribute to initiatives to increase the reliability and applicability of these tools*

PRESENTATION CONTENTS

- **What are Tier-1 tools – some examples for worker exposure assessment**
- **How are they used – experiences under REACH**
- **Boundaries and limitations of Tier-1 tools**
- **Further improvement initiatives**

SO WHAT ARE TIER-1 TOOLS?

Simple algorithms which use semi-quantitative (banded) inputs to produce exposure estimates (inhalation, dermal)

Exposure estimates – in round numbers – are typically based on broad analogies with the high end of existing, consolidated sets of measurement data

They are intended to be:

- *At the same time ‘simple-to-use and inherently conservative’, and best used as initial screening tools (ECHA R.14)*
 - Use a very limited set of inputs to produce an exposure estimate
 - Screening allows efficient and transparent focus on few high(-er) exposure situations needing more detailed assessment and adequate risk management measures

TYPICAL INPUTS NEEDED FOR TIER-1 TOOLS (ECHA R.14)

- Physical state of the substance**
- Physical state of the product handled**
- Vapour pressure (liquids) / ‘dustiness’ (solids)**
- Concentration of the substance in the product**
- Level of containment**
- Efficiency of local exhaust ventilation**
- Duration of activity**
- What is done with the substance (energy exerted, surface area of source in contact with air or skin, amounts handled)**

SOME EXAMPLES OF TIER-1 TOOLS

- **ECETOC Targeted Risk Assessment tool (now Version 3.1): www.ecetoc.org**
- **MEASE - The Metals' EASE <http://www.ebrc.de/mease.html> sponsored by <http://www.eurometaux.org/>**
- **EMKG-EXPO-TOOL <http://www.reach-clp-biozid-helpdesk.de/en/Exposure/Exposure.html> (inhalation estimates only)**

EXPERIENCES TO DATE WITH TIER-1 TOOLS

- **Allowed hundreds of REACH registration dossiers, each with dozens of inhalation and dermal exposure estimates, to be completed in a very challenging timeframe**
- **REACH requires exposure assessments across substance life-cycle, at customer premises and beyond, to which the exposure assessor has no access:**
 - Consolidated at industry sector level by 'Downstream Users' to account for inevitable variation across workplaces
 - Need for standardised (and hence simplified) exposure determinant information
 - Tier-1 tool aligned input determinants proved feasible at sector level
- **Higher Tier assessment with measured data often very resource/time-intensive:**
 - REACH focus on Process Categories (PROCs) – level at which RMM is best defined
 - Existing measurement data e.g. collected for OEL compliance testing not readily linked to REACH exposure assessment
 - New measurement data sets at sector level are time and resource intensive (~2 years)

BOUNDARIES AND LIMITATIONS

- **Tier-1 exposure assessment not intended to replace local health risk assessment required under OSH legislation**
 - But can help to inform the local assessment (and screen, prioritise,)
- **Not all substance types/forms and applications are currently covered ('80/20')**
- **Limited validation**
 - Many different combinations of inputs can produce a myriad of outputs, and not for all of these do we have sufficiently well-described measured data sets
 - Lack of dermal exposure measurement standardisation hinders easy validation
- **Between-User variability (e.g. E-Team)**
 - Freely accessible to inexperienced exposure assessors
 - Lack of clarity for some input choices (e.g. PROCs)
- **Limited choice of Risk Management Measures (LEV, respiratory and dermal PPE)**

IMPROVEMENT INITIATIVES

- **Reviewing findings of E-Team project of German regulator BAuA**
 - Limited number of Process Categories and substances
 - Additional scenarios to be addressed elsewhere
- **Underway: Effective exposure reduction (%) by Risk Management Measures (part of CEFIC LRI project B15) including Local Exhaust Ventilation applications embedded in TRA and MEASE**
- **Just kicking off: External validation of dermal exposure predictions in TRA (CEFIC LRI project B16)**
- **Underway: MEASE 2 considering E-TEAM output (where relevant) and better integration in IUCLID/CHESAR**

WHAT YOU COULD DO TO HELP IMPROVE THESE TOOLS AND PROMOTE EXPOSURE CONTROL?

➤ **If you do exposure assessment for chemical management, improve operation of tools today by:**

- As an outcome of the E-TEAM project: participate in training seminars for the tools
- Applying peer consensus process ('dialogue') for ambiguous inputs
- Sector mapping of inputs (standardise)
- Validate Tier-1 exposure estimates in your substance dossiers with measurement studies, Tier-2 models
- Focus on high hazard substances and/or high exposure situations
- Share your findings with Tier-1 tool owners (e.g. BAuA, ECETOC, EBRC, Eurométaux, etc.)

WHAT YOU COULD DO TO HELP IMPROVE THESE TOOLS AND PROMOTE EXPOSURE CONTROL?

- **If you are a practising occupational hygienist, familiarise yourself with chemical control requirements in your region and start recording chemical management data with your routine OSH-driven exposure measurements**
 - Make your findings available to tool owners/developers:
 - As publications in peer reviewed journals, association news letters, etc
 - Send a note to tool owners e.g. BAuA, ECETOC, EBRC, Eurométaux, etc.
 - Consider that these tools – once fully established – will help you and your customers to focus valuable resources on situations where controls can matter most



THANK YOU FOR YOUR ATTENTION!



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