

Implications from the results and practical recommendations for model developers, users and regulators

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Overview

- Summary of main results
- Comparison of tool predictions
- Implications
- Recommendations



Uncertainty

- Tier 1 tools and hence a relatively high level of uncertainty is expected
- This is addressed by ensuring the tools are conservative, although what this means in practice is unclear
- Sources of uncertainty include
 - Scenario uncertainties: probably high impact
 - Parameter uncertainties
 - Vagueness of parameter definition
 - Model uncertainty
 - Assumptions, dependencies, etc
 - Omitted parameters
 - Model basis (knowledge base and transparency)

User-friendliness

- Tools were found to be very user-friendly
- Generally meet the requirements and demands of users
- Perhaps some suggestions that more could be done with regard to training in the use of tools

Between-user reliability

- Some very large differences in predicted exposures were observed between users
- This could not be explained by expertise, experience, language, sector, etc.
- Similar to results from other studies looking at exposure judgement, ART etc.
 - Notion that tool simplicity reduces between-user reliability does not seem to be correct

External validation



- Generally tools were conservative for powders and volatile liquids
 - but what is sufficiently conservative?
- Difference between exposure categories
 - Powders: TRAv2, TRAv3 and STM were highly correlated with measurement results
 - Correlations were lower or non-existent for other exposure categories/tools
- No evidence that any tools is conservative for metals and low volatility liquids
- Some suggestions that level of conservatism may be different for different PROCs
 - but sufficient comparator data were not available for all PROCs

Implications

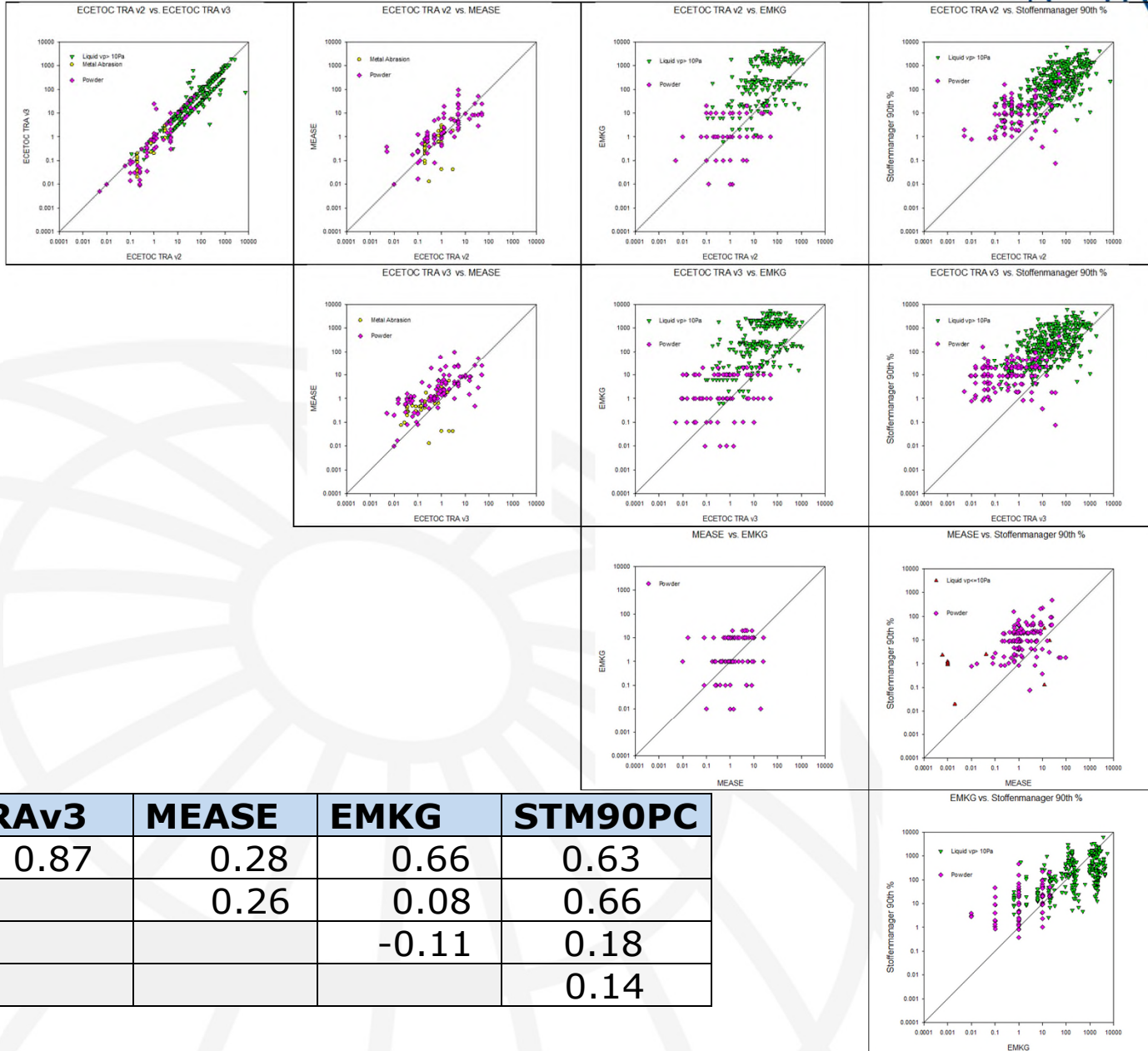
- Are the tools sufficiently conservative?
 - Depends on what is considered to be sufficiently conservative
 - No evidence from this study that they are conservative for low volatility liquids, metal abrasion or hot metal processes
 - Tools need to be used with extreme caution for these exposure categories
- Can the tools predict exposure?
 - For powders there is a strong correlation with individual measurements for TRAv2, TRAv3 and STM
 - Not so much for other tools and exposure categories
 - Would it be possible to improve this?
- Between user reliability
 - In our view, this is the main cause for concern
 - Need to improve the Quality Assurance and training

Recommendations: Tool users



1. Do not rely on just one tool when estimating exposure, but apply several, and use conservatively unless good reason to do otherwise
2. Test the sensitivity of the tool estimates for choice of parameters
3. If exposure data are available, use these too
4. Make sure you read all documentation related to the tool and supporting documents
5. Seek out good quality training in the use of your chosen tool

Between tool comparisons



	TRAv3	MEASE	EMKG	STM90PC
TRAv2	0.87	0.28	0.66	0.63
TRAv3		0.26	0.08	0.66
MEASE			-0.11	0.18
EMKG				0.14

Recommendations: Tool users



1. Seek out good quality training for use of exposure tools
2. Make sure you read all documentation related to the tool and supporting documents
3. Do not rely on just one tool when estimating exposure, but apply several, and use conservatively unless good reason to do otherwise
4. Test the sensitivity of the tool estimates for choice of parameters
5. If exposure data are available, use these too

Recommendations: Tool developers



1. Increase training in use of exposure tools and visibility of guidance documents
 - For example, ask tool user to tick box in the tool if training followed and guidance documents read
2. Carry out specific data gathering exercise for metals and low volatility liquids and for certain PROCs to improve the calibration of the tools
 - Share data/collaborate?
3. Develop a protocol / Standard Operating Procedure (SOP) for tool users, including data collection, data interpretation, sensitivity analyses, verification, etc.
4. Give guidance on the use of PROCs as model parameters
 - How to use these conservatively.

Recommendations- Regulators



1. Quality assurance:
 - Require evidence of training
 - Consideration of use of tools / use of exposure measurement data
 - Consideration of sensitivity to choice of model parameters
 - Round robin testing for exposure assessors using Tier 1 tools
2. Encourage further validation and calibration exercises
 - Exposure is variable over time and location!
3. Encourage development and use of protocols / SOPs for tool applications
4. Provide clarity on the level of conservatism that is required from the tools
5. More data on dermal exposure are required

Recommendations

OTHER SUGGESTIONS??

