

Toxicity of Wood Regulations and Reality

**InnoRenew CoE 1st International Conference
Koper, 7 March 2019**

Address: Kalvarienberggasse 71/22, 1170 Vienna
Mobile: +43 - (0)650 - 362 42 63
Email: office@dobianer.com
www: www.dobianer.com

Als Mitglied des Fachverbandes vertreten bei



VOC (VOLATILE ORGANIC COMPOUNDS)

TVOC (TOTAL VOC)

- ☞ **VOC:** volatile organic compounds, synthetic oder natural origin
- ☞ **Definition:** inconsistent, differentiation by origin, boiling point ect.
- ☞ **Symptoms:** dose dependent
 - headache, dizziness, tiredness
 - irritation of eyes and airways
 - nausea, vomiting, general discomfort
- ☞ **Threshold:** ca. 3 mg/m³ (substance dependent)
- ☞ **TVOC:** sum of all VOC, independent of composition

- ➡ **EC:** Construction Products Directive (CPD), construction products must not be harmful to users, technical harmonization of labelling and product description, CE marking of products (if harmonized standard exists) and Declaration of Performance (DoP)
- ➡ **Germany, Belgium, France:** nations with own regulations (were/are adapted to CPD)
- ➡ **EN 16516:** horizontal VOC testing method, sampling, testing, evaluation of results, for making products comparable
- ➡ **WT/WFT:** without testing, if no emissions are to be expected, without further testing if prior testing showed that product has no emissions or was in the best emission class

- ➡ **Voluntary schemes:** various from industry, environment and consumer protection organizations
- ➡ **Assessment schemes in general:** either mandatory or "voluntary", often quasi mandatory (e.g. public procurement guidelines with voluntary scheme as prerequisite)
- ➡ **Toxicological limits:** differ from scheme to scheme !!!
- ➡ **Evaluation:** 28 day final evaluation, TVOC as k.o. criterion, R-value (addition of risks)

- ➡ **Demolition of buildings:** because they were built of wood
- ➡ **Indemnity claims:** because furniture smells of wood
- ➡ **Regulatory restrictions:** e.g. in wellness areas (sauna)
- ➡ **Voluntary and mandatory assessment schemes:** *de facto* prohibition of wood and wood products, because they are assumed as dangerous and even carcinogenic
- ➡ **A construction company:** No use of resinous northern pine wood for outdoor constructions, "...because it is poisonous..."

TOXICOLOGY - A CRASH COURSE

RISK AND DANGER

- **Evolution:** Mankind evolved from creatures living in forests (with possibly high VOC emissions). So the species had millions of years to accustom itself.
- **Paracelsus:** The dose makes the poison (still valid).
- **Danger:** principal suitability to cause damage
- **Exposition:** probability to be exposed to that danger
- **Risiko:** calculated prognosis for a damage

$$\text{Risk} = \text{Danger} \times \text{Exposition} /$$

(Countermeasures)

- **So risk is relevant and not danger**
- **Without dose no risk! Without risk, no health effect!**
- **frequently:** unknown, confused, ignored, concealed ...

bad TVOC ???



Wikipedia, Wikimedia Commons

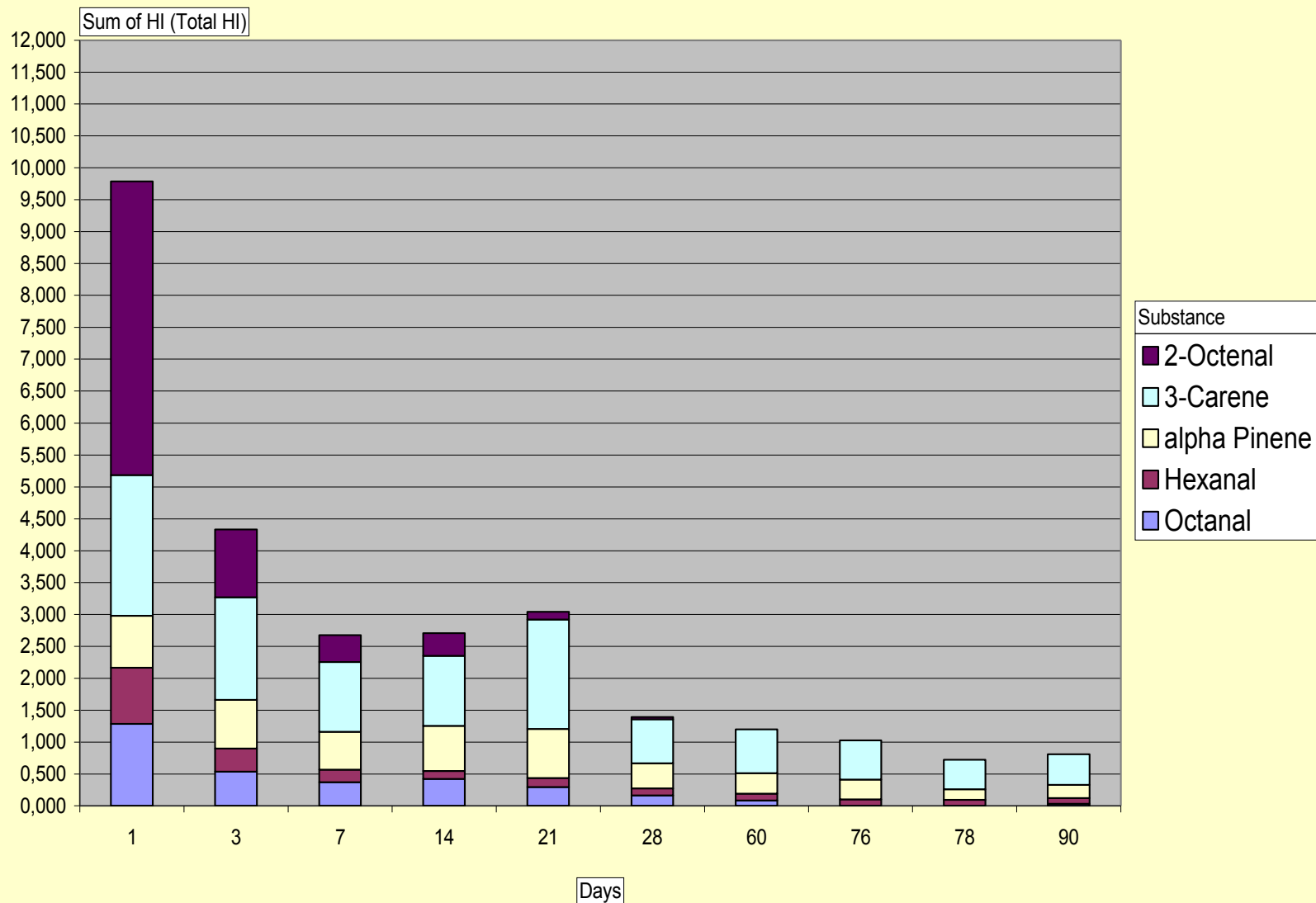
good TVOC ???



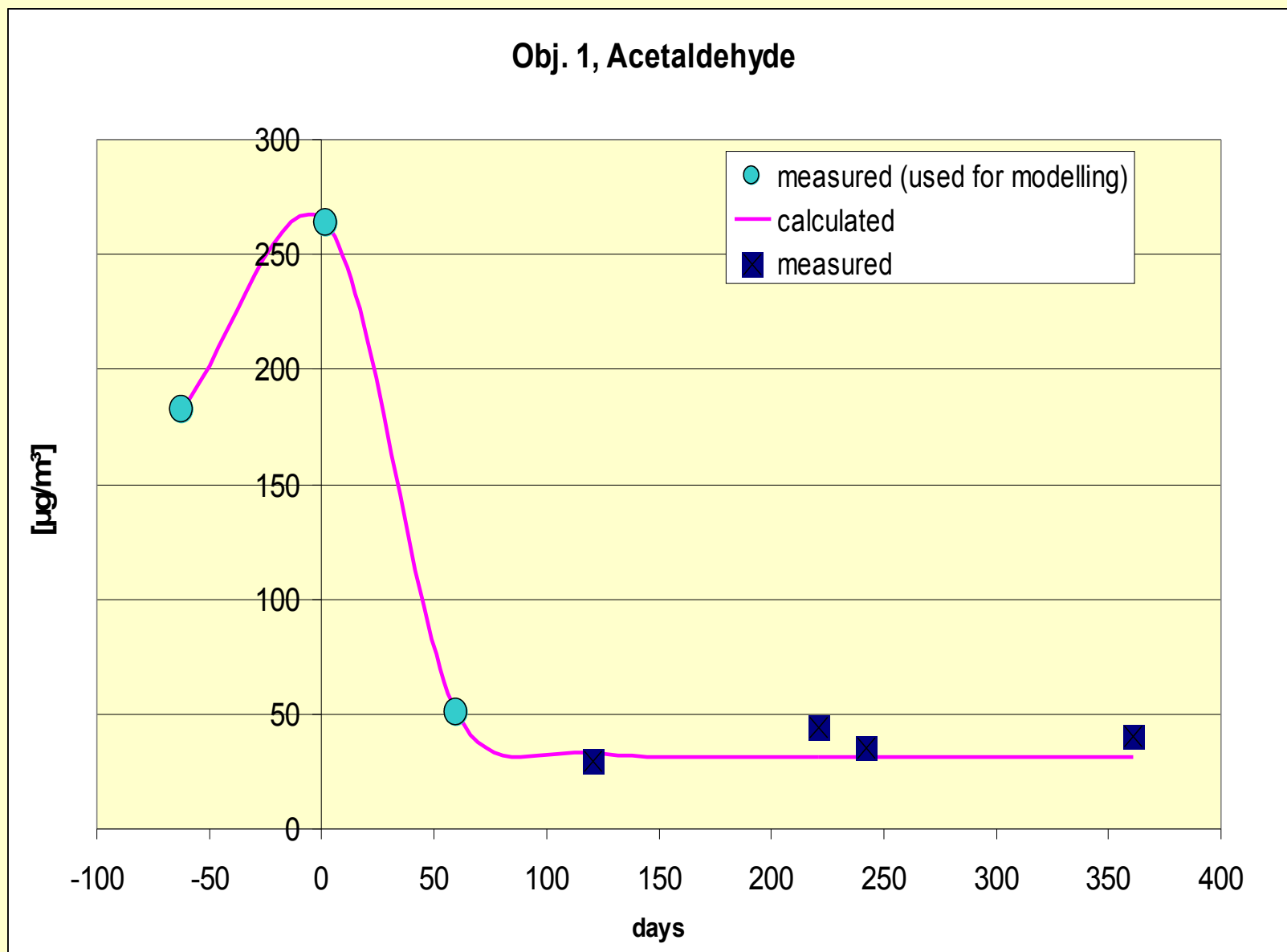
- ➡ **Wood VOC emissions: decline over weeks and months (up to 6)**
- ➡ **Mandatory assessment schemes using 28 days: not suitable for the longterm emission prognosis of wood and wood products**
- ➡ **Prognosis of longterm emission behaviour: can be prognosed rather accurately with a few measurements in the first weeks using a model developed in a project**
- ➡ **EN16516 emission testing: material emission can depend on chamber size !!!, i.e. the smaller the chamber, the higher the specific emissions => hard to derive real live conditions from such measurements**
- ➡ **Other heavy influences on emissions: modifications of the interior and user behaviour**

RESINOUS WOODS ASSESSED BY TIAC SCHEME

Sample (Alle)



EMISSION MODEL - REAL DATA VS. MODEL



- ➡ **TIAC-System:** developed during a project, gives more realistic prognosis of health effects
- ➡ **Foreign products:** some woods and wood products of unknown origin show considerable emissions, even such, which should not occur
- ➡ **European origin products:** vast majority of European wood and wood products are harmless in usual construction scenarios, borderline situations can only occur with very unfavourable or unrealistic surface-volume ratios, very bad ventilation etc.
- ➡ **Finally:** Wood and wood products can also have very advantageous effects on health, but much more research has to be focused on this topic.



Beware of the Oranges !!!

THANK YOU FOR YOUR ATTENTION

DR. KARL DOBIANER

MAS - TOXICOLOGY, EUROPEAN REGISTERED TOXICOLOGIST

Image references: The images in this document originate in part from the free internet encyclopedia Wikipedia (<http://de.wikipedia.org>). For these images the reference is cited at the relevant image together with the type of licence. For the rest of the images all rights are reserved to the Technical Office for Chemistry - Dr. Karl Dobianer. In that case no image reference is given at the relevant image.

Attention: In some parts of this document the personal view of the author is stated. The rest of the contents in this document were thoroughly searched, examined and compiled. Nevertheless, no liabilities or responsibilities can be taken for the correctness of the content. So any use of this document is on the responsibility of the user.

Copyright: The transfer and use of this document in unchanged form for non-commercial purposes is possible with the approval of the Technical Office for Chemistry - Dr. Karl Dobianer. Other rights cannot be derived from this permission.