Wood Dust

Regulations and prevention in Germany

Hubert Gentner, DGUV Fachbereich Holz und Metall
Evolution:

- since 1965: Observation of increased adenocarcinomas of the inner nose
- 1982: Classification of wood dust as carcinogenic Cat. III B
- 1985: Cat. A1 for oak and beech wood
- 1987: TRK-Wert (Technical Reference Value)
  - 2 mg/m³ for new installations
  - 5 mg/m³ for existing installations
- 1988: Occupational disease BK 4203 for oak and beech wood accepted
- 1992: Publication of the TRGS 553
- 1993: Common limit value of 2 mg/m³ with the exceptions for 5 mg/m³
- 1994: "Bavarian project" - Renovation measures for old installations
- 1997: BGI 739 "Wood dust - Health protection"
### Occupational diseases caused by wood dust in Germany:

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Indications on suspicion</td>
<td>49</td>
<td>67</td>
<td>66</td>
<td>87</td>
<td>86</td>
</tr>
<tr>
<td>Confirmed occupational diseases</td>
<td>39</td>
<td>42</td>
<td>48</td>
<td>53</td>
<td>66</td>
</tr>
<tr>
<td>Occupational disease deaths</td>
<td>19</td>
<td>14</td>
<td>22</td>
<td>16</td>
<td>27</td>
</tr>
</tbody>
</table>

*Quelle: DGUV Statistik 2016*
Wood Dust - Prevention:

- BGI 739-1 (new: DGUV-I 209-044) describes the state of the art for implementation of the TRGS 553

- Measures to achieve a shift mean value < 2 mg/m³ with:
  - Extraction measures on stationary machines
  - Requirements for extraction systems

- => Work area "dust-reduced" if:
  - Regulations for practical application observed
  - Machines with the certification "wood dust approved" are used
Requirements for **dust-reduced** working area:

1. Stationary processing machines
2. Power Tools for woodworking
3. Sanding by hand
4. Air return
5. Cleaning
6. Maintenance, audits
### Annex I, DGUV-I 209-044 (BGI 739-1)

<table>
<thead>
<tr>
<th>Arbeitsbereich</th>
<th>Konstruktionsmerkmale</th>
<th>Mindestabsauganschluss DN</th>
<th>Mindestluftgeschwindigkeit (w)</th>
<th>Mindestluftvolumenstrom (V)</th>
<th>Ausführungsbispiel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abschthobelmaschine, Dickenhobelmaschine</td>
<td>Hobelbreite &lt; 63 cm Hobelbreite &gt; 63 cm</td>
<td>140 mm</td>
<td>20 m/s</td>
<td>1.110 m³/h</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>160 mm</td>
<td>20 m/s</td>
<td>1.450 m³/h</td>
<td></td>
</tr>
<tr>
<td>Tischfräsmaschine</td>
<td>Absaugung unter und über dem Tisch. Für Bogenfräsarbeiten sollte ein absaugbarer Bogenfrärsanschlag verwendet werden.</td>
<td>eben: 120 (125) mm unten: 100 mm Gesamtabsauganschluss: 160 mm</td>
<td>20 m/s</td>
<td>1.450 m³/h</td>
<td></td>
</tr>
<tr>
<td>Tisch-/Formatskreissägemaschine</td>
<td>Absaugbares Schutzhaube und Absaugung unter dem Tisch. Die absaugbare Schutzhaube sollte sich möglichst selbstständig absenken.</td>
<td>eben: 80 mm unten: 80 mm Gesamtabsauganschluss: 120 (125) mm</td>
<td>20 m/s</td>
<td>820 m³/h</td>
<td></td>
</tr>
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Activities in carpentry:

Manual work with dust exposure:
- hand sanding works
- assembly works
- cleaning works
- ...

Wood dust exposure:
bench room > engineering room

It. Projektbericht zur TRGS 553
Wood dust situation for hand sanding work:

- **up to now:** Dust limit value of 2 mg/m³ cannot be met without additional measures

- Insufficient acceptance of extraction tables

- In DGUV-I 209-044 few practical measures for manual sanding operations described

- State of the art has developed further
Questions:

- Can the dust limit value of 2 mg/m³ be maintained without an extraction table when using an aspirated hand sanding block?
- How has the state of the dust collection technology for hand-held machines developed?
Results:

Conclusion:

• In the practical tests, the dust limit value of 2 mg/m³ was not reached when using a aspirated hand sanding block.

• Publication in „BGHM Aktuell 02/2017“
Extraction systems - conception, planning and realisation:

Situation: In carpentries, extraction systems are very often incorrectly planned and implemented and are often inadequately effective.

Project content: Guideline for manufacturers and users with a description of all planning steps to be observed and selection of the necessary components.

Project goal: DGUV Information

Project status: ongoing (=> end 2018)
Assessment criteria for compliance with the wood dust limit value of 2 mg/m³ at CNC machining centers

Goal of the project:
• Criteria for assessing the dust concentration at CNC machining centres
• Description of the machine and process conditions
• Representative and standardized test procedure
• Selection of adequate dust measurement methods
• Evaluation of operator exposure

Object:
• Construction of low-dust machines
• Evaluation of the dust collection efficiency of machines
Methods for measuring dust:

- No uniform European method for measuring wood dust
- SHEcan review (2011) for personal samplers
  => Correction factors 0.96 - 3.35
- Analyses very time-consuming
- Hardly feasible for machine manufacturers
- No Correlation between emission and exposure
  - EN 689  Workplace exposure – Measurement of exposure …
  - EN 1093-9  Evaluation of the emission - room method …
  => Measurements are not standardized for group of machines
- Identification of potential improvements at the machine
  (previously only Ø over all operations)

=> uniform European standard required!
Vision - Goal:

- **Emission**
  - Machine 1 >> wood dust
  - Machine 2 > wood dust
  - Manual workplaces
    - Emission ≅ Exposition
    - EN 50632
  - CNC machining center manless

- **Correlation**
  - Emission – Exposition
  - Art. 114 Machinery Directive
  - Art. 153 Carcinogen and Mutagen Directive

- **Exposition**
  - Exposition
  - Workers
  - Harmful to health

Hubert Gentner, BGHM
Résumé:

• Number of diseases caused by wood dust remains critical
• Dust sources are difficult to determine and evaluate
• no data on real dust emissions from machines and workstations
• No uniform European measurement methodology
• so far no correlation emission ⇔ exposition
Thank you for your attention!

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