



**IFA**

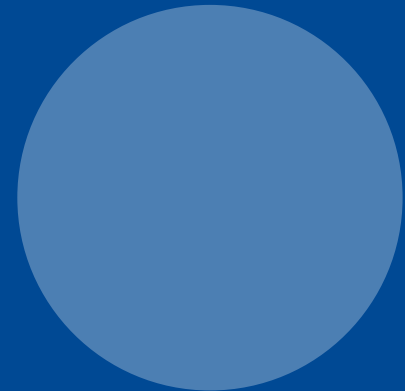
Institut für Arbeitsschutz der  
Deutschen Gesetzlichen Unfallversicherung

# Asbestos in plasters, adhesives and fillers:

Work associated with  
exposure in existing buildings

2019 PEROSH Research Conference

Nils Lamm, 11. Sep 2019



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# Current situation, status and problem

## Legal framework for activities involving asbestos

- Hazardous Substances Ordinance (**GefStoffV**)
- Technical Rules for Hazardous Substances (**TRGS**) **519**:  
„Asbestos: Demolition, reconstruction or maintenance work“
- Technical Rules for Hazardous Substances (**TRGS**) **517**:  
„Activities with potentially asbestos-containing minerals and mixtures and products manufactured from same“

## Hazardous Substances Ordinance (GefStoffV): Annex 2, Number 1

### Policy:

- „Work shall be prohibited on parts containing asbestos in buildings, equipment, machines, installations, vehicles and other articles.”
- “The extraction, preparation, further processing and reuse of mineral raw materials which occur naturally and preparations and articles manufactured therefrom which contain asbestos with a mass content of more than 0.1 per cent shall be prohibited.”

### Exception: (regulations by TRGS 517 / 519)

- Demolition, reconstruction or maintenance work
- Use of Mineral Resources lower than 0.1 per cent content

## Products on wall coverings

- Products like fillers, adhesives (e.g. for tiles) and plasters:
  - typical mass content asbestos 1-5 %  
(could be lower than 1 %, but also up to 30 %)
- may appear ...
  - repair of walls and ceilings (planar or punctiform)
  - under wall, floor and ceiling tiles
  - linear (or planar, punctiform) interstice filler

## Work in existing buildings

- If asbestos is not recognized in such building applications by an inspection, such product applications are **inadvertently worked mechanically** and lead to particular danger (e.g. removing adhesives, hammering, drilling ...)
- Working with products on wall coverings could lead to very high asbestos fiber concentrations

For example:

Fillers are used in thin layers; small quantities of such a building product result in large-area asbestos applications in the building

**Low content in high application !**

## Work in existing buildings

Activity	Exposure of Asbestos in ambient air - fibers/m <sup>3</sup>	Source
<b>Drilling</b> of several holes in tiles with asbestos-containing adhesives	36,000	Carbotech, non-published presentation „Forum Asbest Haus der Technik“ 2014
<b>Knock-off</b> several tiles with asbestos-containing adhesives	77,000	Carbotech, non-published presentation „Forum Asbest Haus der Technik“ 2014
<b>Abrasion</b> of asbestos-containing adhesives	1,000,000	Carbotech, non-published presentation „Forum Asbest Haus der Technik“ 2014



# Surveying and sampling concept

# Surveying and sampling concept

The number of samples to be taken is essentially determined by four parameters:

1. desired reliability (asbestos yes/no)
2. Percentage of the area containing asbestos in relation to the area to be assessed
3. the number of asbestos-containing separate sites and their size distribution within the area to be assessed
4. Size of the taken (and analysed) sample

# Inhomogenous distribution

Required number of sampling points to obtain a sufficient statistical accuracy of: \*

Ratio of asbestos-containing area	50 %	80 %	90 %	95 %
1 %	46	107	153	199
3 %	16	35	51	66
4 %	12	27	38	49
5 %	9	21	30	39
10 %	5	10	15	19
20 %	2	5	7	9
50 %	1	2	2	3

*\*VDI-Discussion paper: Asbestos in buildings*

## Samples from walls in existing buildings

- material samples from walls in existing buildings consist of:

**Colour + Wallpaper +  
Plasters/Fillers + Rocks**

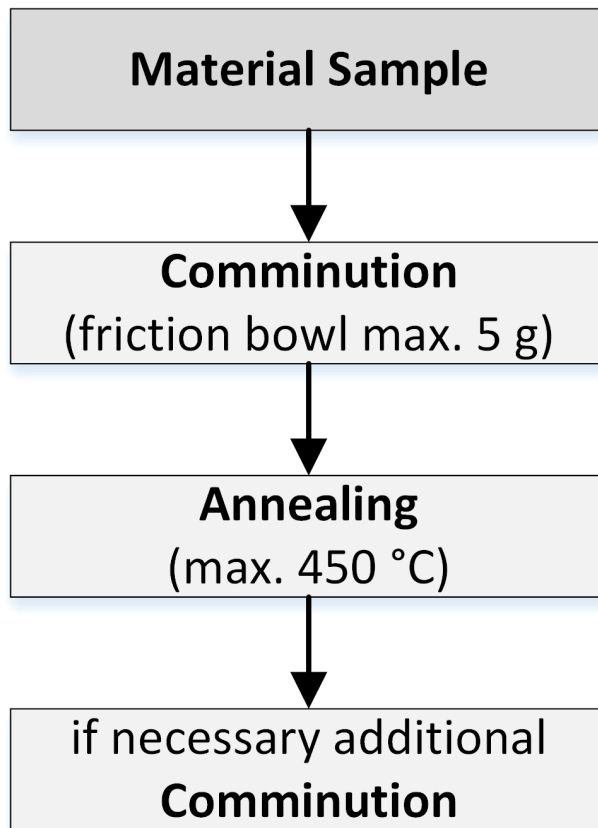
- in such samples  
asbestos content  $< 1 \%$   
( $< 0.1 \%$  typical)



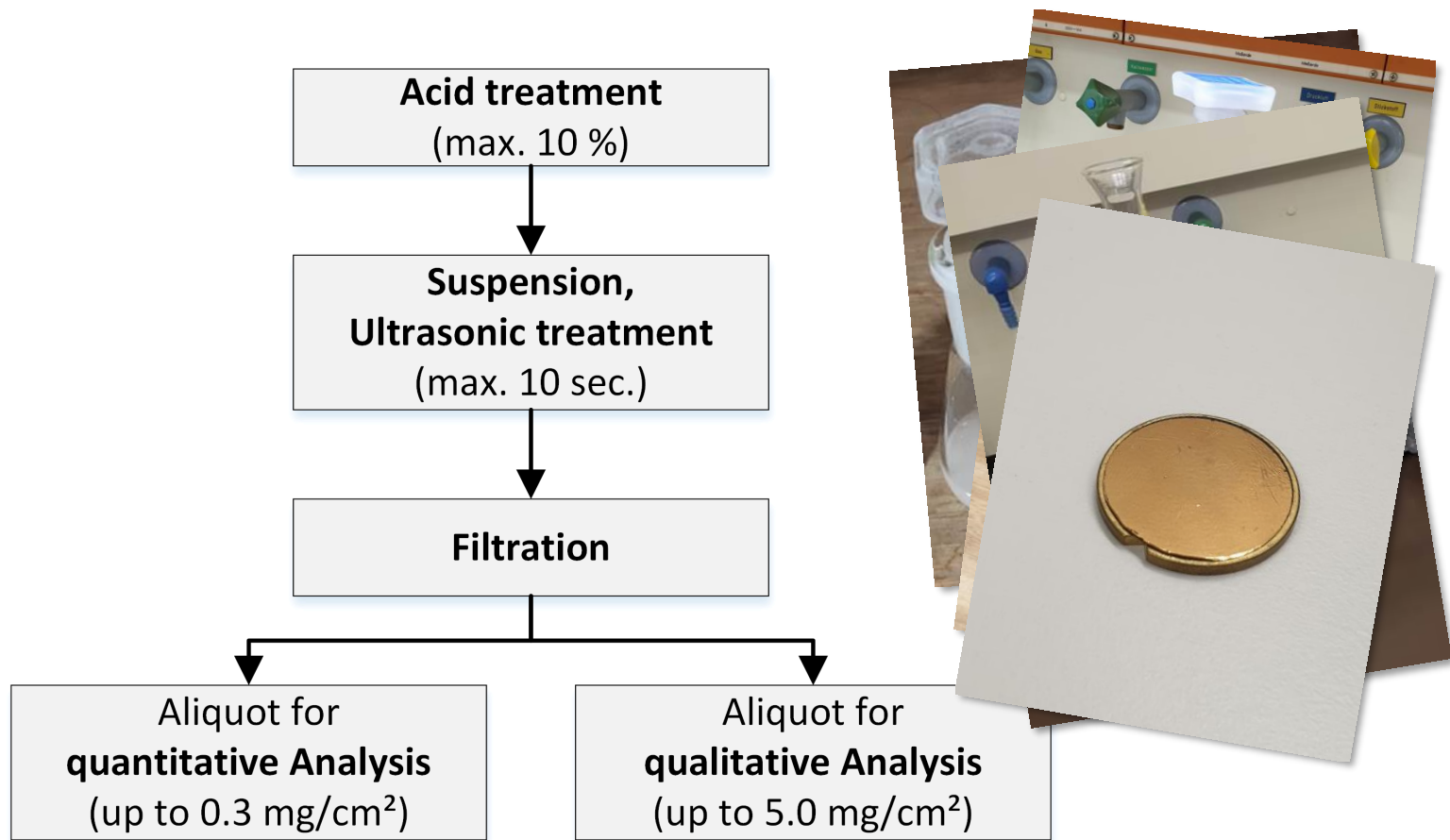
asbestos containing  
material sample

# Analytical determination

# Preparation of material samples



# Preparation of material samples



## SEM-EDXA

- tiered analysis:
  - 50-fold: 40 mm<sup>2</sup>
  - 200-fold: 2,5 mm<sup>2</sup>
  - 1000-fold: 0,15 mm<sup>2</sup>
- 0.001 % estimated limit of detection (LOD)
- no legal lower limit for asbestos content
- primary: asbestos yes/no?  
secondary: asbestos content (plausibility, comparability)
- type of asbestos  
(Chrysotile typical for plasters, adhesives and fillers – Crocidolite / Amosite atypical;  
Anthophyllite / Tremolite / Actinolite aggregates of mineral resources)





# Measurement campaign

## Measurement campaign

- **Asbestos in plasters and fillers**
- conducted by the German Social Accident Insurance Institutions
- reference measurements on a large scale

### Purpose:

- Determination of the exposure to ***asbestos fibers*** and ***dusts*** (*respirable and inhalable dust, quartz*) for typical activities in existing buildings.
- characterize low-emission processes

# Measurement campaign



personal measurement



stationary measurement

## Measurement campaign

- measurement support for ongoing reconstruction work on known asbestos-containing surfaces
- working with processing systems by the executing company



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