

bausa:

Federal Institute for Occupational  
Safety and Health

BAuA research project

## **SysDEA**

Systematic analysis of dermal  
exposure to  
hazardous chemical agents  
at the workplace

Dr. Gudrun Walendzik

## Outline

- **Introduction - Background information on dermal exposure measurements**
- **Objectives of SysDEA**
- **Project overview / timeline**
- **Execution - key aspects**
- **Concept for scientific exchange**

# Introduction - Background information

## Issues to be addressed by future research on dermal exposure:

- Measuring methods for occupational dermal exposure are currently not harmonized
- Scientific studies are missing concerning the evaluation of significance and applicability for existing measurement methods
- Need for detailed examination to what extent a measurement method takes into account the physical and chemical properties of the individual hazardous substance
- Lack of comprehensive systematic studies applying consistent/comparable methods to measure dermal exposure

**WHO-Paper: “Environmental Health Criteria 242 (2014) - Dermal exposure” → gives partly similar recommendations**

# Goals of the SysDEA research project (I)

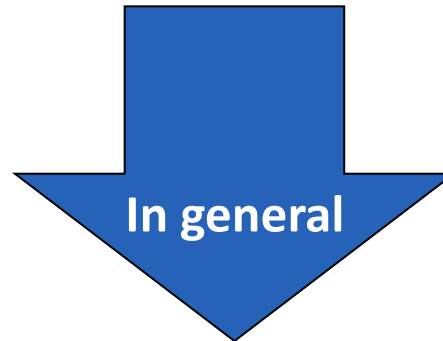
**Generation of a data collective on occupational dermal exposure by means of systematic investigations in test rooms.**

## As a basis for:

- **Characterisation of different measurement methods**
  - strengths and weaknesses
  - if possible conversion factors
- **Development of a comprehensive assessment basis for the responsibilities of risk assessment for chemicals**
  - minimization of uncertainties

## Goals of the SysDEA research project (II)

Utilize data for further development of dermal exposure assessment tools



Generation of scientific knowledge  
to improve and standardise  
measurement/assessment methods for  
dermal exposures to chemicals  
at the workplace

# Project overview

## WP 1

Literature research to determine the current status of dermal exposure measurement methods

## WP 2

Analysis of literature and development of a draft schedule for the experimental design

## WP 3

Measurements of potential dermal exposure in test rooms

## WP 4

Statistical analysis of measurement data and comparative discussion

## WP 5

Research report and dissemination

# Facts and figures

- **Project start:**

01.01.2014

- **Timeline:**

2014 – 2018

- **Work packages**

WP 1: 01/2014 - 12/2014

WP 2: 01/2015 - 06/2015

WP 3: 06/2015 - 12/2016

WP 4: 01/2016 - 09/2017

WP 5: 09/2017 - 02/2018

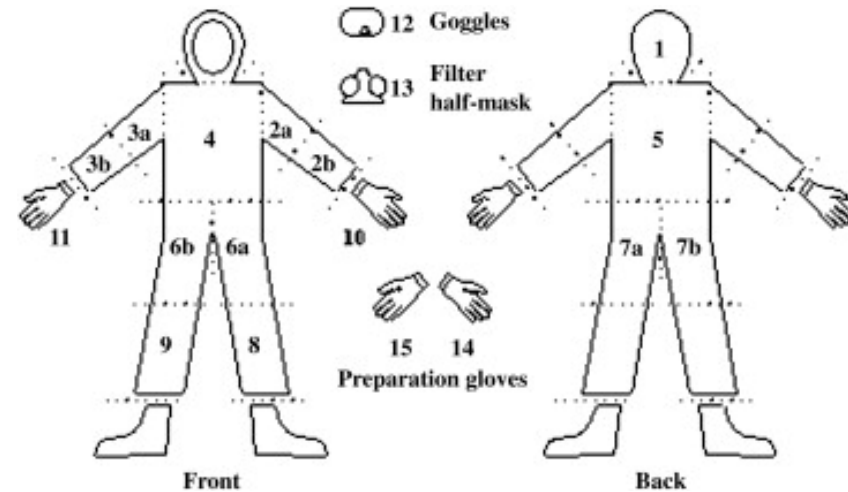




# Potential measurement methods in the frame of SysDEA

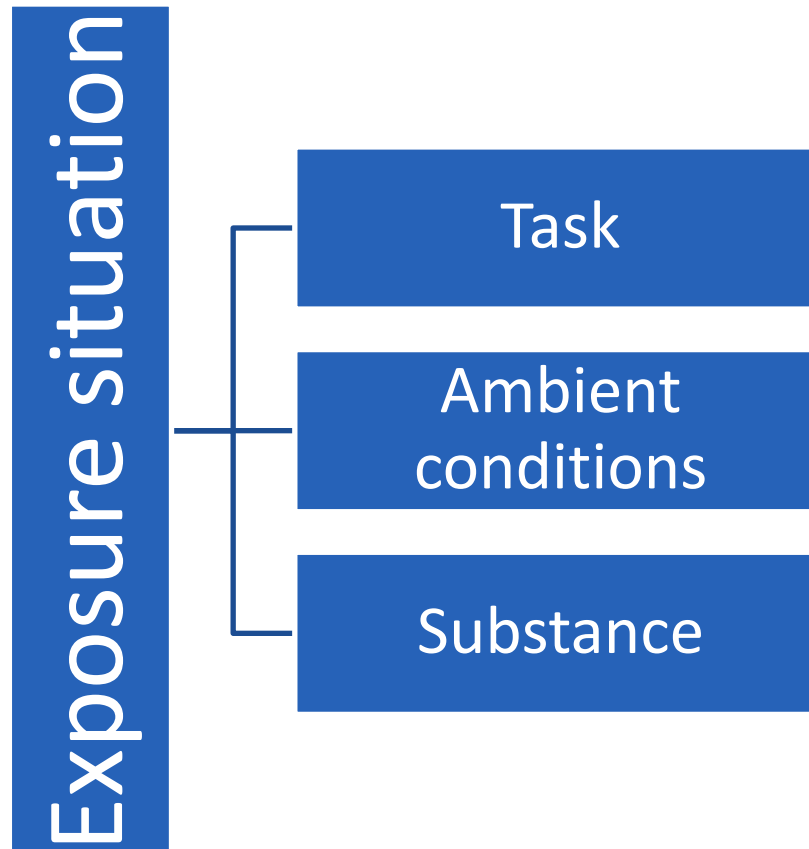
interception techniques	patches
	overall (e.g. Tyvek®)
	glove method
Removing techniques	wiping method
	tape-strip-method
	rinsing method (hands)
In-situ techniques	Detection via UV-fluorescence or tracer by means of video imaging (ATR-FTIR)

green: hands    blue: body    orange: body + hands



## Procedure (I)

Quantification of dermal exposure by various measurement methods for different exposure situations



## Procedure (II)

**Dermal exposure of probands performing selected tasks under defined and standardised conditions is to be measured in test rooms with liquid and solid test substances by different measurement methods.**

### **Determinants to be controlled/standardised (excerpt):**

- **Physical data: temperature, air humidity, airflow**
- **Room size and room geometry**
- **Substance properties: viscosity, vapour pressure, dustiness**
- **Standardized execution of the tasks (training)**

## Proposal for scientific exchange

**BAuA is willing to share results of the project with experts on dermal exposure to optimize the scientific outcome.**

For this purpose:

- An informal group of scientists would be helpful to discuss scientific questions arising in the course of the SysDEA project e.g. by means of:
  - Written procedure
  - Informal workshops
- BAuA would like to ask interested scientists to participate in an informal group of experts accompanying the SysDEA project.

# Thank you for your attention



**Federal Institute for Occupational Safety and Health**

**Unit 4.1 "Exposure Scenarios"**

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