THE FUTURE IN MONITORING AND MANAGEMENT OF CARCINOGENS

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TNO innovation for life

INTRODUCTION

- Not new: one of the first official cases identified in the eighteenth century
- Cancer is the first cause of work-related deaths in the EU: 53%
- The number of deaths in the EU around 102,000 per year
- Estimate of at least 666,000 people worldwide per year*
- Across the EU, 1 in 5 workers faces an occupational cancer risk
- Asbestos is the biggest killer: over 100,000 lives a year worldwide.
- Estimate: 10 million death worldwide due to asbestos before it is controlled
- Worldwide more death from work-caused cancer than from work accidents.
- > 50 substances are listed as known or probable causes of workplace cancer
- Well known examples: asbestos, diesel exhaust, welding fumes, silica

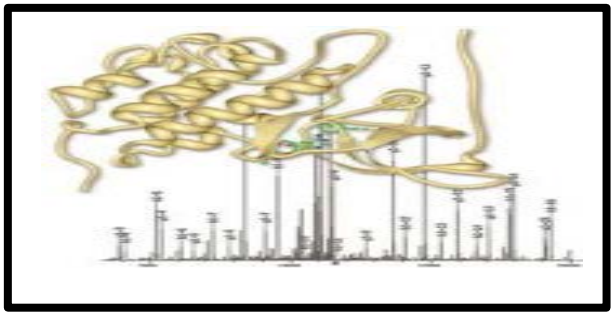
THE TECHNOLOGICAL DRIVERS

Smart information collection

Sensor technology

Big data

Satellite data



Systems Biology
Transcriptomics, proteomics, and metabonomics

Non invasive high throughput biomarkers

TRENDS

1. Monitoring

Measuring exposure | Modelling exposure | Personalized sensing | Personalised realtime exposure

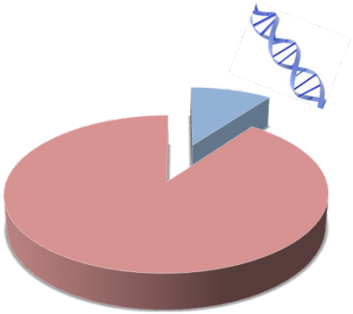
2. Exposure type

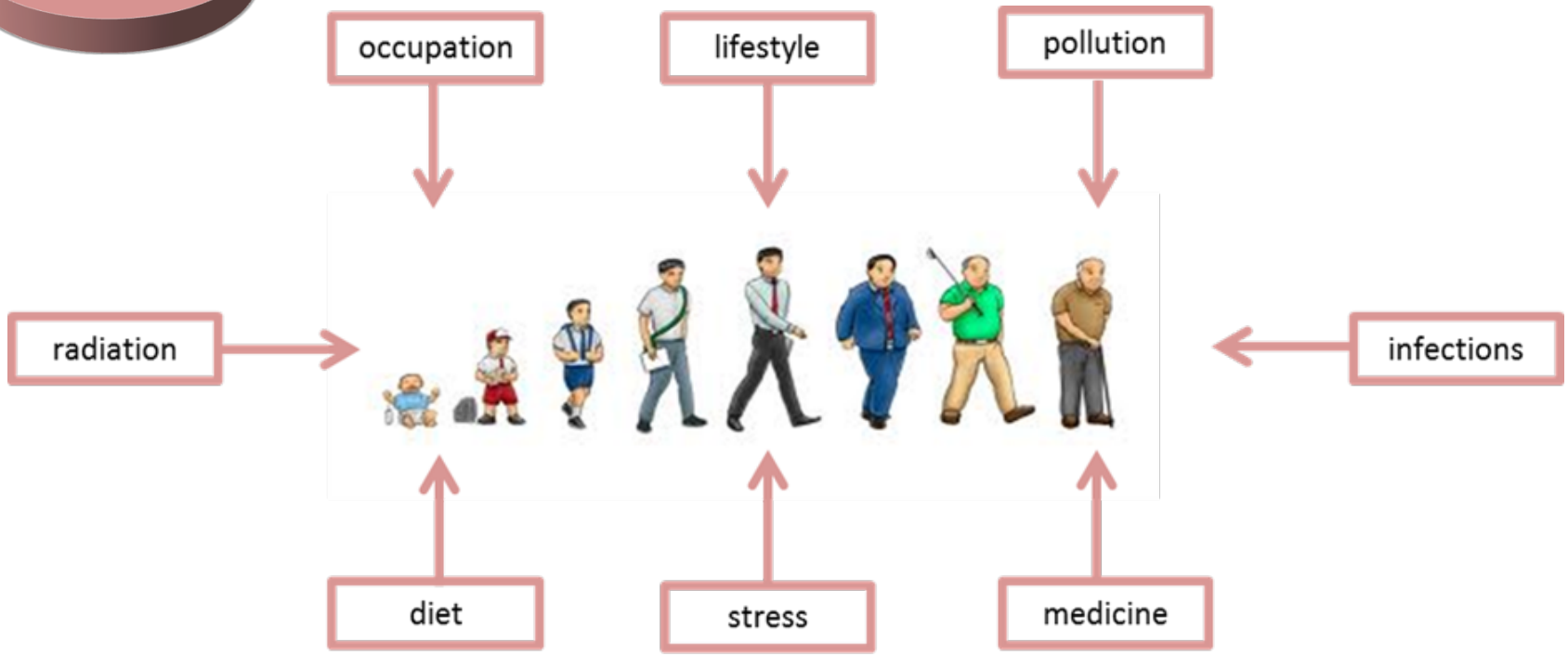
Occupational Exposure | Consumer Exposure | Critical exposure periods | **Life time exposure**

3. Exposure route

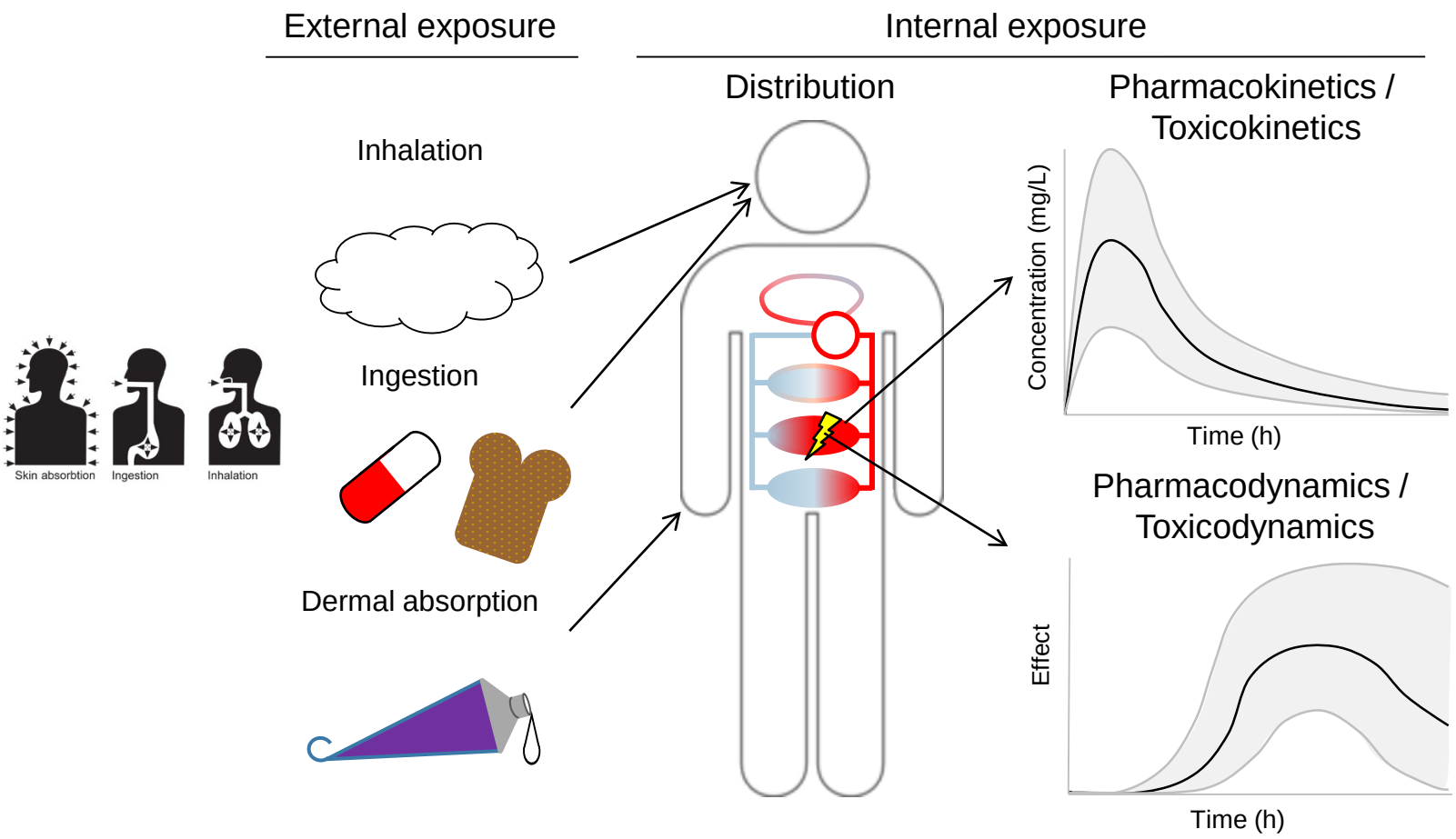
Inhalatory exposure | Dermal exposure | Ingestion exposure | Integrated internal exposure

LIFE TIME EXPOSURE: THE EXPOSOME





INTEGRATED EXPOSURE: EXTERNAL – INTERNAL EXPOSURE MODELLING

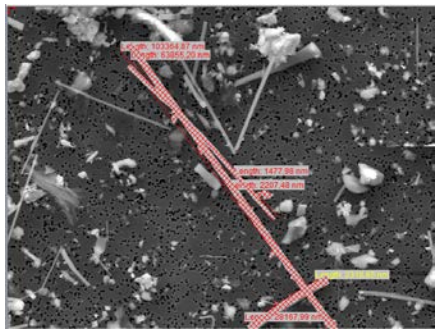


PERSONALISED SENSING

Chemicals

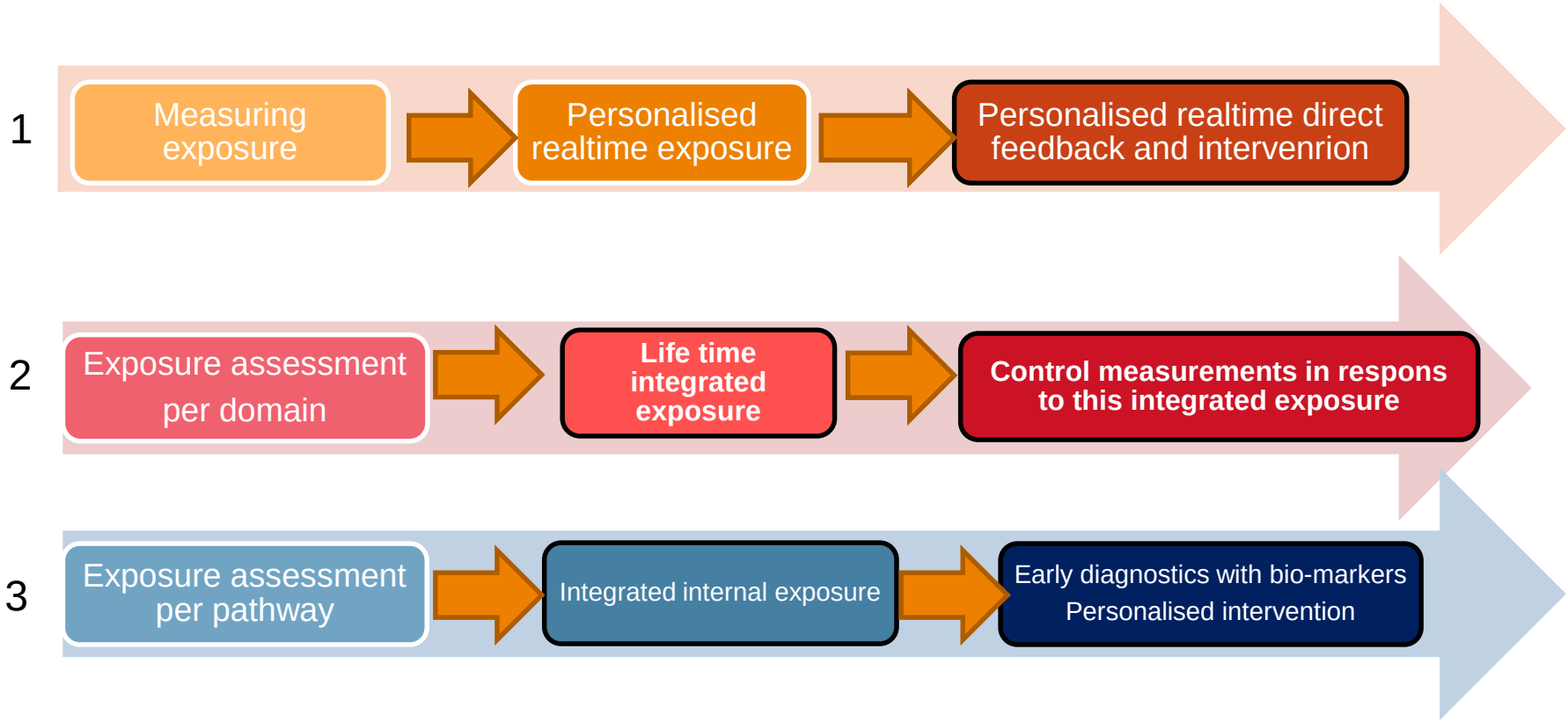
Particles

Point of care biosensors



Asbestos

IMPLICATIONS FOR MANAGEMENT



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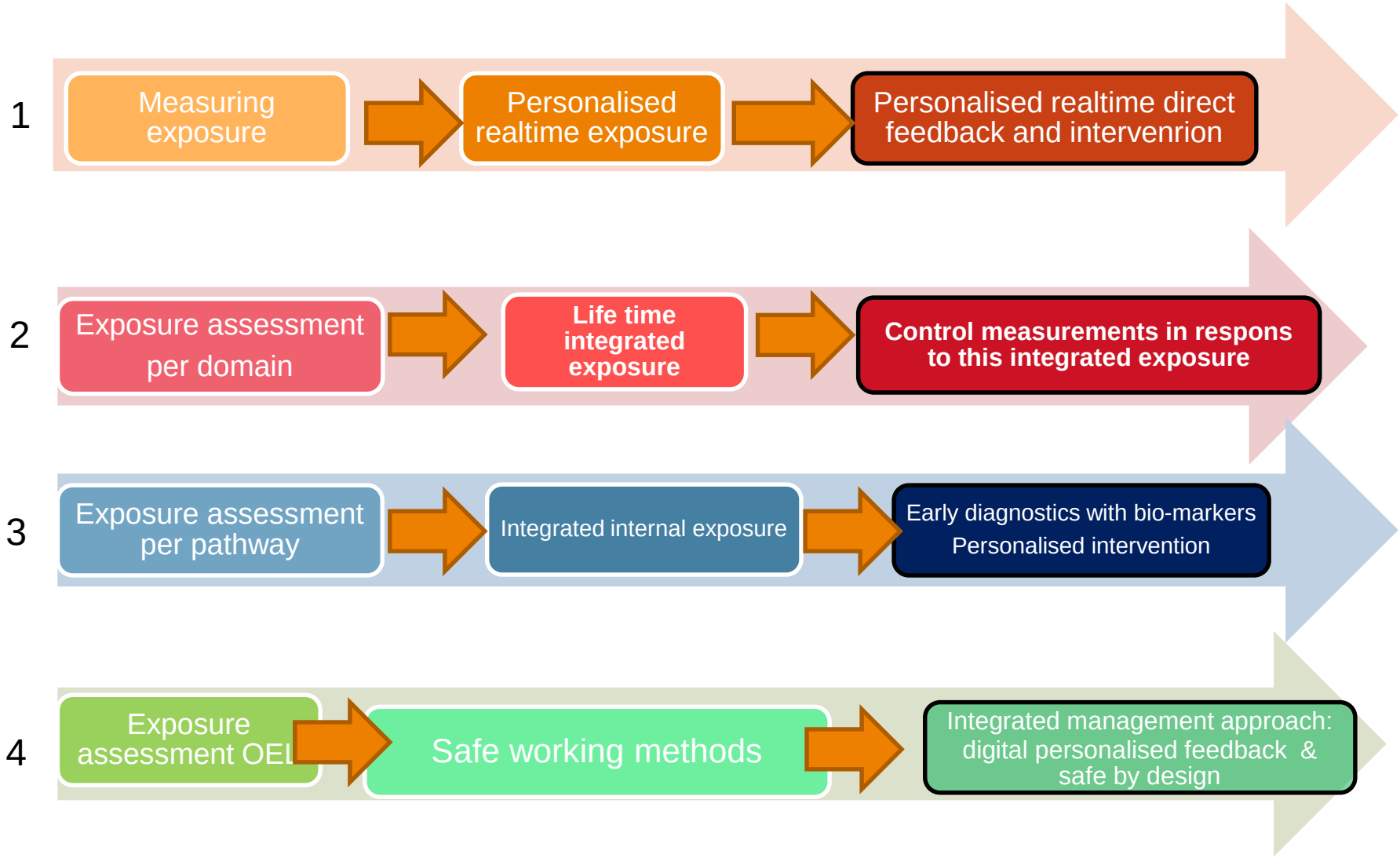
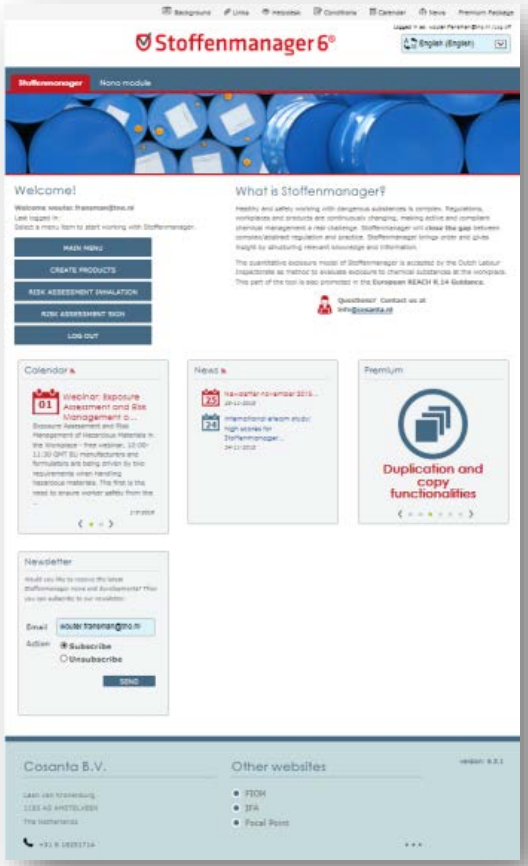
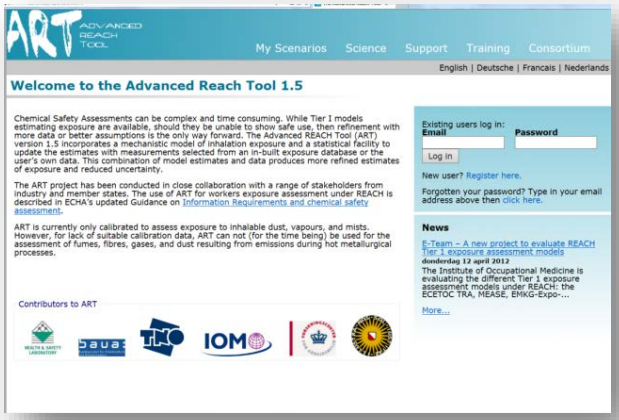


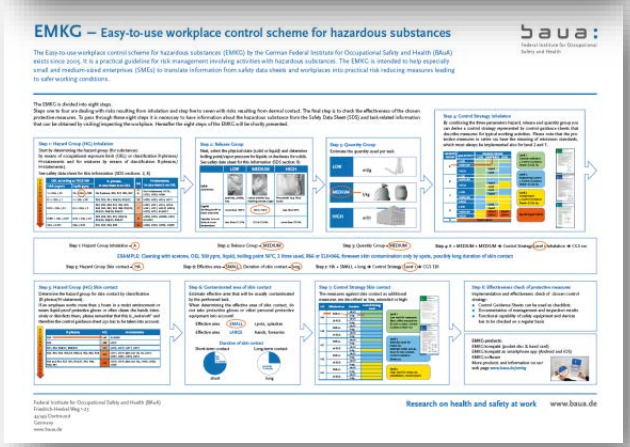
PERSONALISED MANAGEMENT TOOLS

- Vermoeidheid ↓
- Slaapkwaliteit ↑
- Gezond gedrag ↑

MANAGEMENT: INTEGRATED APPROACH







Safe & healthy working methods

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www.dustfreeworking.tno.nl

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DUSTFREE WORKING

Dust-free working means dust-free tools. Sign the petition.

READ MORE

DUST-FREE WORKING

Fine particulate matter is harmful to health, particularly when it contains carcinogens like respirable crystalline silica (RCS), hardwood, chromium and nickel. Workers coming into contact with this dust must be very careful and work in a responsible, safe and – above all – healthy way.

For TNO, it is essential to reduce workplace exposure to fine particulate matter (PM) – and to develop more systems to achieve that. Our goal is "dust-free working".

Together with Bosch, DeWalt, Dustco, Festool, Hilti, Makita, Metabo, Numatic, Starmix and other equipment manufacturers, we are therefore actively developing effective management systems for fine particulates. These include vacuum extractors, which can reduce exposure to particulate matter by as much as 100 times. The resulting "dust-free" tools and systems are assessed (validated) using a TNO Performance Test.

Every tool or system has its own test. Amongst other things, this measures actual user exposure to harmful substances. Workers correctly using a device which has passed its test do not exceed the current Dutch statutory long-term occupational exposure limits for PM (GSW TGG-8u: Workplace Exposure Limit, eight-hour time-weighted average). Moreover, such use is accepted by the Inspectorate SZW, the Dutch labour inspectorate, as constituting adequate exposure management.

NEWS

10 December 2015
More than 3000 deceased anually by occupational diseases in The Netherlands

5 November 2015
European Innovation Award for Extractor Welding Torch

14 October 2015

1 October 2015

27 August 2015

All News items ››

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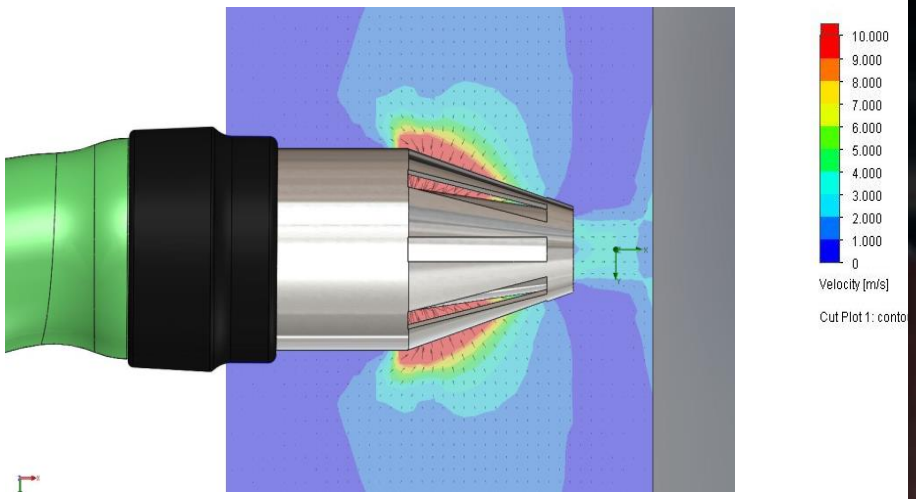

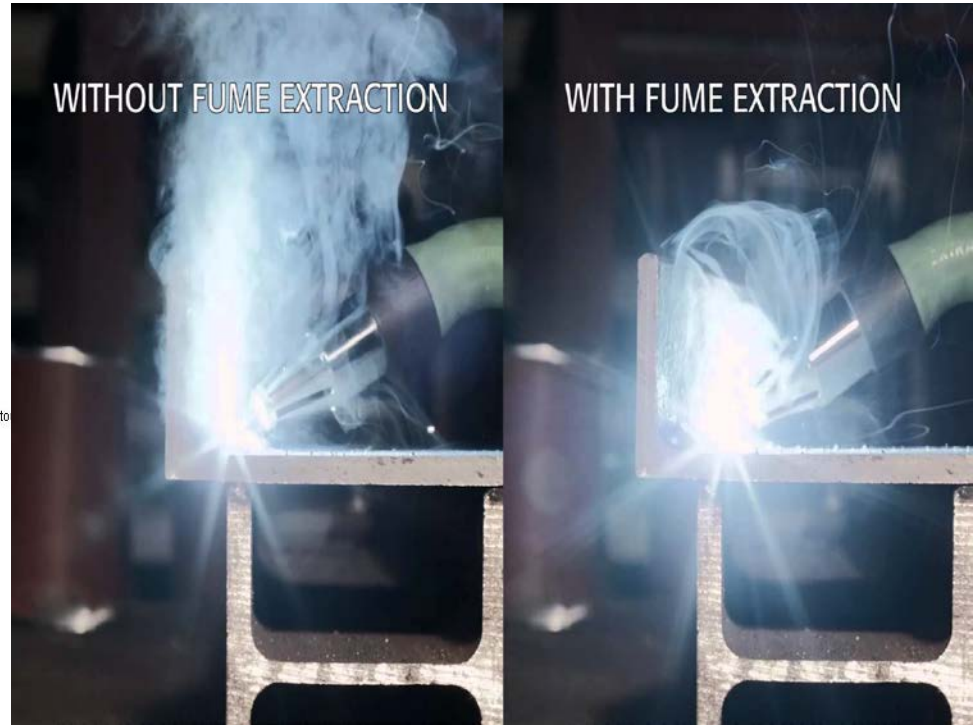

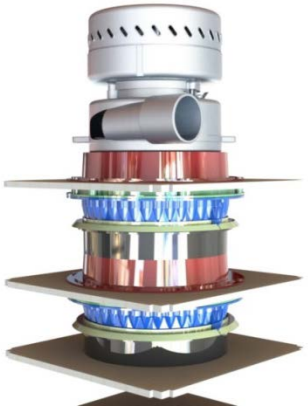

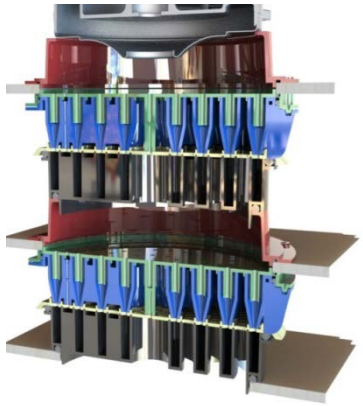

Safe working methods relating to dangerous substances

IN CONCLUSION

- New emerging technologies allow better understanding of risk and effect
- Open the gate to a real time personalized assessment and more direct and targeted management
- Make early warning systems more widely available which allow for better protection and pro active management
- Digitalization should lead to the necessary integrated information on what to do for all stakeholders (onsite information, on site learning, feedback etc)
- Effective management is an integrated effort (personalized and context) which is embedded in the culture and core business of companies
- Regulators can actively incorporate validated good practices in their policies to make the best practice the easy practice


THANK YOU FOR YOUR ATTENTION
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