Az ergonómusok szerepe a veszélyes anyagok kezelésében

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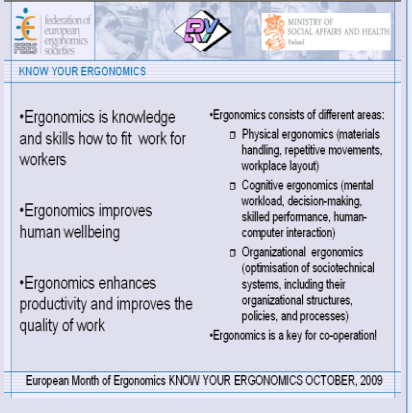
European Month of Ergonomics since 2009

Know your ergonomics …

- **Ergonomics provides the knowledge and skills for fitting the environment, equipment and activities to people**
- The dual aims of ergonomics are to improve the **well-being of people** and to enhance **productivity of work systems**
- **Ergonomics is a scientific discipline and development tool to create healthy and effective work places**
- **Ergonomics is a very good investment**
- **Ergonomics is a profession with requirements**



Our contribution

- FEES is a reliable partner in the EU, a gateway to national associations and individuals
- We work by our members country level with focal points and individuals
- Organise events or sessions
- Relay information
- Mainstream message into education
- Communicate what you are doing to do
- Organise thesis contest on the subject
- Submit best practices
- Feed back what you done
- Translate / adapt / improve the EME material

EME

European Month of Ergonomics

October, 2018 and 2019

Ergonomist to manage dangerous substances better

Launched 24.05.2018, Poznan, Poland

What is EME?

- The European month of ergonomics (EME) is an annual campaign for the promotion of ergonomics in Europe.
- The EME is initiated by the Federation of European Ergonomic Societies (FEES) and implemented by the national Ergonomics societies.
- The FEES is an official partner of the European Agency for Safety and Health at Work (EU-OSHA).
- **The EME 2018 and 2019 supports the EU-OSHA Healthy Workplaces Campaign**. In 2018 and 2019 the topic of the EU-OSHA campaign is:

MANAGE DANGEROUS SUBSTANCES

The corresponding FEES campaigns EME 2018 and 2019 focus on the role of ergonomics within this topic:

ERGONOMIST TO MANAGE DANGEROUS SUBSTANCES BETTER

Objective of European month of ergonomics

The **European Month of Ergonomics** 2018-2019 is a device of the **Federation of European Societies to**

increase the performance, well-being and Satisfaction

when managing hazardous materials at workplaces,

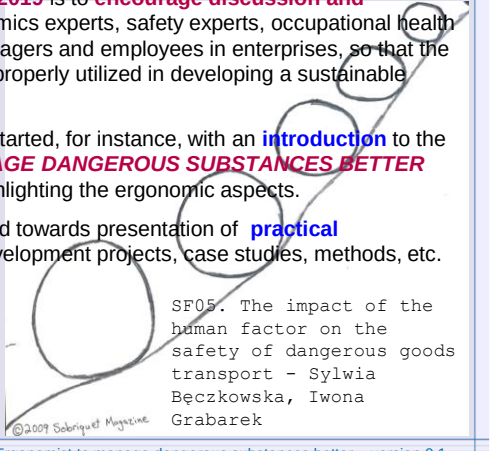
in line with the EU-OSHA **Healthy Workplaces Campaign** 2018-2019.

Aims of EME 2018
European month of ergonomics

- Specify the ergonomics substance in the context of EU-OSHA campaign.
- Emphasize the added value of the ergonomics profession in regard of management of dangerous materials.
- Present various ergonomic areas for managing hazardous materials.
- Understand and apply ergonomic principles and concepts for management of hazardous substances.

EME 2018 and 2019

- The **aim** of the **EME 2018 and 2019** is to **encourage discussion and collaboration** between ergonomics experts, safety experts, occupational health and safety authorities, and managers and employees in enterprises, so that the **knowledge of ergonomics** is properly utilized in developing a sustainable working life.
- In **2018**, the campaign can be started, for instance, with an **introduction** to the topic ***ERGONOMIST TO MANAGE DANGEROUS SUBSTANCES BETTER*** together with **discussions**, highlighting the ergonomic aspects.
- In **2019**, the focus can be shifted towards presentation of **practical applications**, research and development projects, case studies, methods, etc.



SF05. The impact of the human factor on the safety of dangerous goods transport - Sylwia Bęczkowska, Iwona Grabarek

The STOP principle

- Employers need to set effective preventive and protective measures
- Dangerous substances and processes should be completely eliminated from workplaces (e.g. designing new work processes)
- If elimination is not possible, risks must be managed based on a hierarchy of prevention measures — the STOP principle
- If primary prevention fails, early detection of exposure and fast response

Substitution (safe or less harmful alternatives)
Technological measures (e.g. closed system, local exhaust ventilation)
Organisational measures (e.g. limiting the number of exposed workers or the exposure time)
Personal protection (wearing PPE)

What is ergonomics?

- **Ergonomics provides the knowledge and skills for fitting the environment, equipment and activities to people**
- The dual aims of ergonomics are to improve the **well-being of people** and to enhance **productivity of work systems**
- For the practical application of ergonomics, the following subfields are identified:
  - **physical ergonomics** – e.g. postures and movements, physical workload, manual material handling, workplace design
  - **cognitive ergonomics** – e.g. information processing, mental workload, human-computer interface, applications for transmitting information
  - **organisational ergonomics** – e.g. coordination of work processes, such as assembly lines, combinations of work activities, work-rest schedules, collaborative development of work activity
- **Ergonomics is a scientific discipline and development tool to create healthy and effective work places**

What is true ergonomics like?

For many reasons, application of ergonomics is often limited to **physical ergonomics** or even only to workplace arrangements. However, to achieve sound results, a more **holistic concept** of ergonomics is required. This means that, e.g.[1]:

- **systems approach** is used, e.g. taking all interactions between the worker and the elements of the work system into account, and, applying all relevant knowledge and experience
- application of ergonomics is **design driven**, taking place in design activity, and in all stages of the design process, e.g. in concept design, in the design of the premises, in the design of the work system, in implementation, in evaluation, in redesign, or, in the continuous improvement of the system
- the aims include both **well-being of the people** and **performance of the system**, thus providing all achievable benefits as well as acceptance and support of all groups concerned in the enterprise.

[1] A strategy for human factors/ergonomics: developing the discipline and profession (IEA 2012)

Physically handling

- The risk of work-related MSDs can be higher for dangerous materials.
- Heavier – safe containers adds extra load
- Bigger – of the secure packaging
- The required PPE can prevent proper lifting techniques
- Can't hold tight because of material / container properties
- Liquids can move in the tank so the balance of the load is uncertain
- More attention is required to move

- Solutions
- Special packaging
- Eliminate manual handling
- Packaging ready for mechanised material transport: bag, barrel, box
- Material handling equipment (lorry, milk container) and other tools

Ergonomics beyond wMSDs

But good ergonomics is more than wMSD and assessment of work posture, repetition, and human effort, it also includes e.g.

- taking into consideration human information processing and error when designing chemical processes,
- applying knowledge on human capabilities, abilities and limitations in product (e.g packaging / tool) design,
- using system approach,
- individual differences and special needs,
- usability and accessibility.

Individual differences

- To provide healthy and safe working conditions all the relevant characteristics should be considered of the target group e.g.
  - age, gender, experience;
  - body size, fitness, vision;
  - attention, accuracy, compliance;
- Certain groups of workers can be particularly at risk from dangerous substances, because of particular sensitivity, inexperience or because of a lack of training or information.
- Habits and situational factors connected to material consumptions can increase risks, like
  - tobacco, alcohol and drug abuse,
  - drug treatment
  - lack of proper nutrition or obesity,
  - chronic diseases (e.g. diabetes, allergy).

Ways to avoid accidents

- Avoid contact with hazardous material
- Sensory detection of hazard signals related to dangerous materials – better illumination, sound signals, tactile markings
- Cognition of danger – knowing the materials (SDS)
- Decision on how to avoid danger – responsible attitude and behaviour
- Ability to make a decision - anthropometrics , bio-mechanics, motion capabilities

Jerry D.Ramsey: Ergonomic factors in task analysis for consumer product safety, Journal of Occupational Accidents Volume 7, Issue 2, July 1985, Pages 113-123

STOP Engineering measures

When we can't eliminate or substitute, and we know the risk …

- Eliminating contact
  - Eliminate unnecessary contact
  - Closed material transport and storage
  - Isolation of operators (e.g. telepresence)
- Prevention of inadvertent contact
  - Removal (filtering) - from air / water
  - Locking the material
  - Closing the storage unit
  - Access control by design, e.g. special caps
  - Marking process, and product identification
  - Need to do – need to access, e.g. biometric ID

Sensory detection

- The environment of the hazardous substance should allow detection, e.g. be clear around the hazardous material
- Already under the threshold is to be detected (visible, audible, odorous, tactile)
  - Added odours (like cooking gas)
  - Be bitter (like seeds dressed against pests)
  - Getting in touch should be disadvantageous (e.g. cause itching)
- Appearance (size, graphic elements, colour, pitch), layout (visibility, position), intensity (repetition, volume, marking substance concentration).
  - Be readable (font etc.)
  - Sensory channel (e.g. when shipping, when door is opened), Braile

Cognitive ergonomics Accessibility - Recognise danger

- The identity of the substance is visible on the basis of characteristics or under the limit of other characteristics
- Recognition of packaging e.g. gas tank
- Recognition of packaging markings
  - Standard markings
  - Pictograms (ADR, CLP, etc.)
  - Hazard statements
- Dangers, prevention, treatment, compensation, etc. markings
- Colours
- Fit to the situation / Fit to the user
- Compiling wording
- Substance documentation
  - Structure
  - Content
  - Wording

Requirements for closed technologies

- Closed drive chain: no physical work, no contact
- Design for machine handling - Machine design requirements
- Markings
- Lock out – tag out
- Maintenance requirements

Usability (UX) design of packaging

- Materials that are used for packaging, for transport, and for cleaning them, such as water, may also become hazardous
- Material handling equipment e.g. ladle, pump
- Usability of packaging (opening, closing, dosing, storage, delivery)
- Usability of protective devices (danger, capture, comfort, fit, tried-and-tested protection)
- Usability of documentation (structure, searchability, maintenance, modalities, information scheduling)

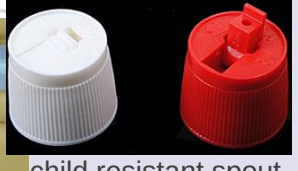
Design examples

push down and turn

squeeze & twist

Liquid Waste Containers

Child Resistant Locking Pouch



child resistant spout closure with valve seal

Organisational ergonomics

- Can help to eliminate modality changes, decrease exposures, define better processes
- When dealing with hazardous materials the information provision is of high importance
- Improve e.g. the storing and displaying hard copies of material safety data sheets, the design of printed or electronic SDSs, the organisation of the downstream and feedback information flow and the provision of information to workers.
- Regular cleaning
- Collection of residues
- Cleaning of cleaning tools and packaging

Use of PPE

- Very last resort – PPE to reduce risk arising from dangerous materials handling
- Antropometric design, size, adjustment, fit
- Comfort (movement, thermal etc.)
- Getting on / taking off
- Vision
- Extra load
- etc

And not to forget the overall benefits for the work organization...

Ergonomics is beneficial

By application of ergonomics in workplace design, **the healthy working conditions** as well as **the performance of the entire work organization** can be ensured.

To summarise, the following outcomes can be achieved:

- Lower rate of **accidents** and fewer **sickness absences**
- Lower **staff turnover,** longer **working careers**
- Better **motivation and commitment** of the workers, higher use of their **skills**
- Less **disturbances and losses** in production due to human error
- More **fluent operation** and better **quality** of production, better **productivity**
- Higher **competitiveness** of the organization on the **market**

Ergonomics to manage dangerous ubstances better: good for health and good for business!

Awards

wMSDs

2020-2022

European Month of Ergonomics 2018-2019 – Ergonomist to manage dangerous substances better version 0.1

Thank you

Let us work together for creating workplaces for all ages – ergonomists together with other OHS specialists and with the people at work!

Let us show the role and potential of ERGONOMICS in such development!

Thank you for your interest!

The FEES-campaign European Month of Ergonomics
to promote ergonomics in Europe

FEES – Federation of European Ergonomics Societies

www.ergonomics-fees.eu