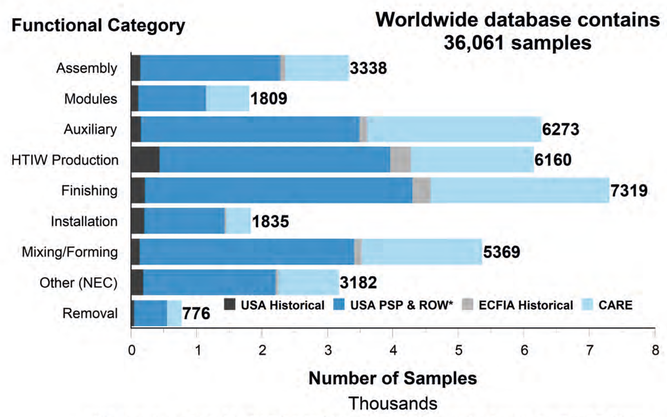
PRODUCT STEWARDSHIP PROGRAMME (PSP)

DEVELOPING A NEW APPROACH FOR THE INVESTIGATION OF FIBROUS DUST EXPOSURE FOR OCCUPATIONAL SAFETY AND HEALTH IN PRACTICE.

AUTHORS AND AFFILIATIONS: DAWN WEBSTER (ALKEGEN); MARK WOODWARD (ALKEGEN); NICOLA ROBINSON,(MORGAN ADVANCED MATERIALS); HARALD KVIECIEN (KOHS)

ECFIA

ECFIA, the European Association representing the High Temperature Insulation Wool (HTIW) Industry, founded in 1979, has as its key objective to improve Occupational Health and Safety, Initiating and promoting research and disseminated information on Health, Safety and Environmental aspects related to HTIW.



PRODUCT STEWARDSHIP PROGRAMME

This case study outlines a new approach to support the ongoing occupational safety and health program, under the product stewardship programme (PSP) CARE (Controlled and Reduced Exposure) within the High Temperature Insulation Wool (HTIW) industry.

The programme, which continues to be implemented today, follows well established principles of risk assessment and risk management. Its components are science based, with human health effects research as a priority.

Our PSP is worldwide in scope and has collected over 36,000 TWA measurements since it began.

This current study is a collaboration between ECFIA and KOHS, an Austrian Research organisation, who help develop PIMEX (PIctures Mix Exposure) based methods and software to perform PIMEX interventions.

ECFIA were an early adopter of PIMEX, while still in the developmental stages and feedback from ECFIA has helped to inform the improved functionality of PIMEX. The main benefit compared to traditional techniques was the visual aspect as a communication tool.

AIMS

This study assesses the impact of novel techniques, in terms of effective communication and leading to employee and employer understanding of what influences fibrous dust concentrations in air; when evaluating the impact on fibrous dust concentration levels at industrial sites following its introduction.

The study has raised further discussion on the demand for research on instrumentation for field measurements, intervention methods and the relationship between measurement data when compared to knowledge of the tasks, materials and health impact in this industry sector.

With fibrous dust the fraction that can reach the deep region of the lung is of most concern. Traditional PCOM measurement are generally used to assess this respirable fibrous dust fraction; but there is a delay between the taking of the measurement, analysis and reporting of results. The employee cannot see this respirable dust fraction and when results are presented, they are not fully aware of what this means to them.

METHODS

Using the PIMEX system in conjunction with the RESPICON, we are also looking to consider thoracic through to alveoli dust (albeit spherical dust);

PIMEX (PIcture-Mix-EXposure) is the principle of concurrent measurement of sensor data and capturing video sequences of work tasks, which allows the visualisation of real work situations.

Respicon TM is a direct reading, combined gravimetric, photometric instrument for the measurement of inhalable, thoracic and respirable dust fractions, reflecting the penetration pattern of particles into the human respiratory system. Developed for time-resolved monitoring and sampling of these three fractions as defined in European standard 481.

The Respicon TM was thought a suitable instrument in this study, as wirelessly connected to a kohs.PIMEX.system (version 4). Although the Respicon TM is not designed to count fibrous particles specifically, this configuration was considered a practical way to visualise and analyse task based exposures of fibrous dust.

content, which was used for a range of learning approaches: learning at the job, virtual learning, evaluation of control measures.

Exposure data for ASW/RCF in a range of functional job categories (FJC), collected over the last 10 years, using traditional and PIMEX techniques, have illustrated how this technology has evolved within this collaboration; to further develop a robust real time visualisation tool. This has been effective with respect to visual communication of best practices that transcend language barriers. and is able to reach a wider audience.





In terms of fibrous dust exposure, a suitable measurement instrument, was required to perform a PIMEX intervention, as such a direct reading instrument, which can be applied directly at the breathing area of the worker, was needed.

Data collected under PSP CARE has been evaluated and compared to the PIMEX outcomes in various settings using Pimex for the visualisation of fibrous dust exposures, in real-world interventions. This visualisation helped to create digital

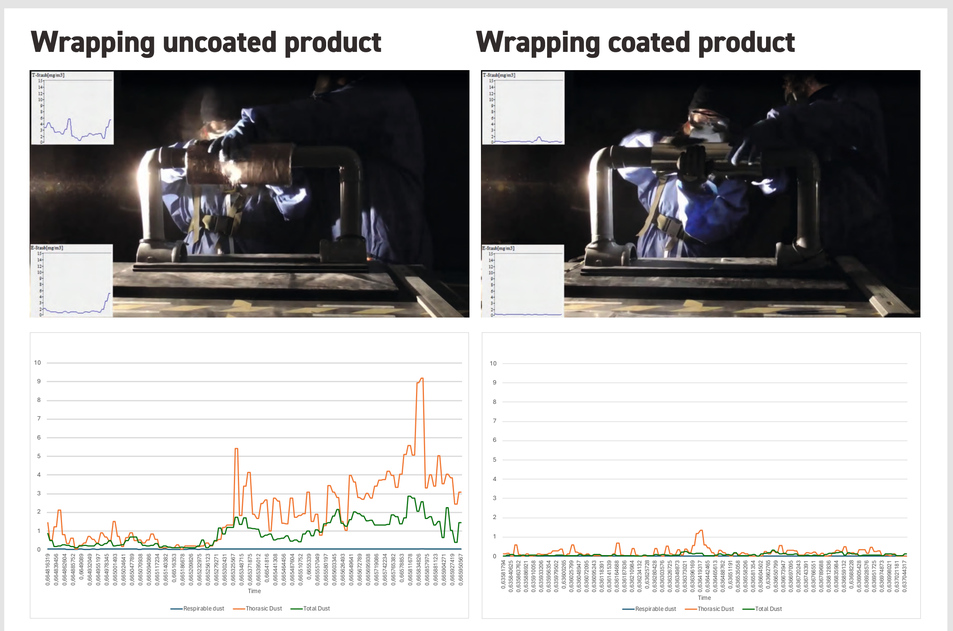
RESULTS

For Europe alone, >12,100 TWAs have been collected to date within the CARE/PSP, using personal monitoring over representative periods of the shift, using PCOM and SEM techniques.

The CARE/PSP has been successful over the 29 years it has been in existence and has had a beneficial impact, resulting in promoting the introduction of control measures following the hierarchy of controls approach. The limitation with traditional techniques is that it is the statistical and numerical results that are presented. With this study the data collected in combination with PIMEX over the last 10 years has resulted in more effective communications.

The benefit of using PIMEX is that there is an immediate response and a visual representation, so the employee can clearly see the impact of their actions on the level of dust generated.

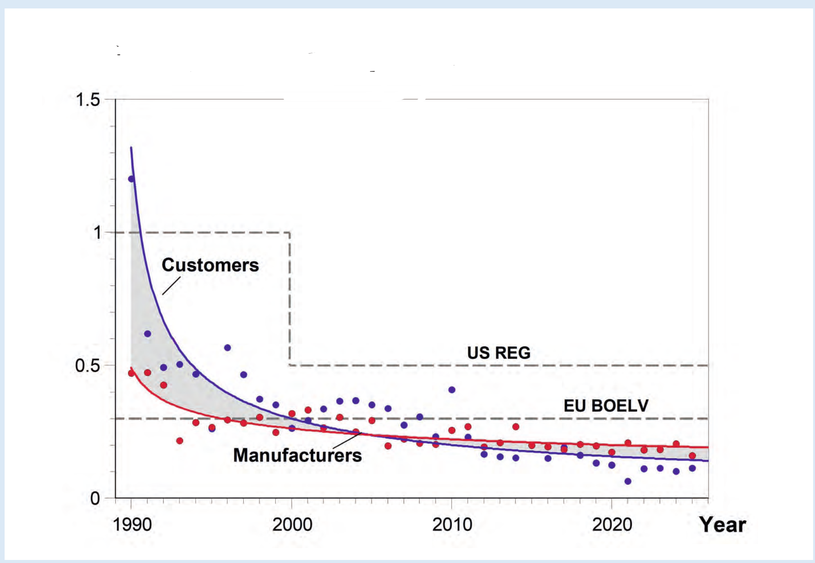
As a result this approach has had a further beneficial impact on the use of control measure, working practices and ultimately on worker exposure



SUMMARY

Increased communication: with use of novel visual techniques has led to a change in industrial practices and worker engagement.

The traditional PCOM data has demonstrated that there has been an overall reduction in fibre exposure at manufacturers and user's facilities.



The PIMEX system has been widely accepted in the industry as a training tool, easily understood and applied following adaptions of working practice to demonstrate improvements.

The next steps would be to further develop the software to enable use with other direct reading equipment, adding greater mobility by simplifying the monitoring train.

A further challenge would be to determine if the PIMEX data can be adjusted in relation to an elongated particle rather than the typical spherical particles.

Continuation of our collaboration with KOHS is on-going to further develop the process in order to have this adapted with greater specitivity to fibre related applications

CONCLUSION

THE COMBINATION OF TRADITIONAL DUST MEASUREMENT WITH PIMEX, OFFERS A KEY COMMUNICATION TOOL WHICH SUPPORTS EFFORTS TO REDUCE FIBRE EXPOSURE.

WWW.ECFIA.EU
INFO@ECFIA.EU