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Polyurethane one-component foam (OCF) and spray foam can (SFC) technologies (containing > 0.1% by weight MDI)

FEICA, the Association of the European Adhesive & Sealant Industry, is a multinational association representing the European adhesive and sealant industry. Today's membership stands at 15 National Association Members, 24 Direct Company Members and 19 Affiliate Company Members. The European market for adhesives and sealants is currently worth more than 17 billion euros. With the support of its national associations and several direct and affiliated members, FEICA coordinates, represents and advocates the common interests of our industry throughout Europe. In this regard, FEICA works with all relevant stakeholders to create a mutually beneficial economic and legislative environment.

Background

One-component foam (OCF) manufacturers representing more than 90% of the polyurethane one-component foam market in Europe are members of FEICA. These OCF manufacturers work together within FEICA to develop standards, professionalise the industry to ensure it complies with current legislation and anticipate future challenges. This position paper will try to explain the differences between two entirely different technologies on the market that may look alike because of the identical packaging. These technologies are the polyurethane one-component foam (OCF) and the spray foam can (SFC), both containing > 0.1% by weight methylene diphenyl diisocyanate (MDI).

The two different technologies explained

OCFs (also referred to as PUR or PU foams) are extruded as a froth and used for applications improving energy efficiency and generating indoor comfort. They bring significant benefits to window and door installation tasks. OCFs seal, deliver thermal and acoustic insulation and render joints airtight while still allowing water vapour to migrate. Quick and easy to use, they are typically supplied in convenient pressurised containers and extruded on-site. Application takes some minutes and full curing occurs usually within hours.

FEICA's OCF Technical Working Group (TWG) has developed a range of standard test methods that deliver realistic, reproducible results for OCF products. Customers can rest assured that the data, generated according to the agreed test methods, placed on product packaging and referred in literature, provide an accurate and fair representation of the product performance, allowing a reliable comparison of different OCF products.

Recently a number of products similar to OCF cans were introduced in several European countries. These products are in reality spray foam cans, but they look identical to OCF cans. During the application of the SFC, the methylene diphenyl diisocyanate (MDI) exposure can be higher than that

for OCF, especially when the spray foam cans have a MDI content similar to that of OCF. This paper refers only to the conventional, MDI-containing products, whose safety aspects are known.

SFC products with a diisocyanate content over 0.1%, that are available to consumers should bear a 'use advice against', since the MDI consortium has submitted in the REACH dossier a 'use advised against of' spray application by consumers as it is not safe for them. The consumer use of SFCs is not covered in the REACH dossier, and as such this usage of MDI - in SFCs - is forbidden. If one wishes to promote a product for this use, a real Risk Analysis Study should be run and notified to the ECHA.

OCF products manufactured by FEICA members are fully compliant with established EU regulations. For PU-based products sold to the general public, restrictions are already in place (please click [here](#) for additional information). FEICA has been at the forefront of the discussions regarding the ongoing PU restriction on the use of diisocyanates (please click [here](#) for more information). The different technologies (OCF and SFC) have different training requirements within the EU regulation; OCFs fall under level 1 (general training) while SFCs fall under level 3 (advanced training requirements).

Please see more details about the two different technologies in the tables below.

	One Component Foam (OCF)	Spray Foam Can (SFC)
Technology	1 component, moisture curing	1 component, moisture curing
Packaging	small aerosol can or pressurized container (ca. 10 kg)	small aerosol can or pressurized container (ca. 10 kg)
Application	mainly used as gap filler but also as adhesive, applied as froth on site	mainly used for insulating bigger surfaces e.g. attics, roofs, applied as spray on site
<ul style="list-style-type: none"> ○ Application time for one user approx., in the same application area ○ Curing time 	<ul style="list-style-type: none"> up to 2 cans per hour hours 	<ul style="list-style-type: none"> up to 20 cans per hour minutes
Intended uses	<ul style="list-style-type: none"> ○ professional use ○ consumer use 	<ul style="list-style-type: none"> ○ professional use ○ spray application for consumers is not REACH Registered (Registration nr. 01-2119457015-45), hence prohibited. It is considered not safe as control can not be guaranteed.
Health risk	skin & respiratory sensitizer	skin & respiratory sensitizer
<ul style="list-style-type: none"> ○ Skin exposure risk ○ Inhalation exposure risk 	<ul style="list-style-type: none"> low-medium low 	<ul style="list-style-type: none"> low-medium high, not only for the applicators but anyone near this work will be at risk
Risk Management Measures		
<ul style="list-style-type: none"> ○ Ventilation ○ Training ○ PPE 	<ul style="list-style-type: none"> interior application requires adequate ventilation general training (Level 1) on safe handling safety glasses, gloves & protective clothing with long sleeves 	<ul style="list-style-type: none"> interior application requires adequate ventilation the application requires a higher degree of RMM compared to OCF and the selection, use and maintenance of these RMM are more demanding, requiring more intensive training (Level 3) to avoid incorrect selection, use, maintenance and application safety glasses, gloves, protective clothing with long sleeves & a self-contained breathing apparatus with an external air supply

	One Component Foam (OCF)	Spray Foam Can (SFC)
Safe handling	<p>When OCF applicators follow appropriate safety measures, the potential hazards associated with OCF chemicals in the workplace can be effectively managed through the use of:</p> <ul style="list-style-type: none"> o natural ventilation o work instructions/practices, training (Level 1) o appropriate Personal Protective Equipment 	<p>When SFC applicators follow appropriate safety measures, the potential hazards associated with SFC chemicals in the workplace can be effectively managed through the use of:</p> <ul style="list-style-type: none"> o Local Exhaust Ventilation (LEV) o work instructions/practices, in-depth training (Level 3) o appropriate Personal Protective Equipment incl. Respiratory Protective Equipment o restricting unauthorized access to the work zone
Risk of explosion or fire	<ul style="list-style-type: none"> o The risk of fire is related to the type of blowing agent/propellant used and the effectiveness of the ventilation. o In small OCF cans flammable propellants are used, increasing the risk for fire. o If the small aerosol cans are stored at elevated temperatures, there is a risk of rupture/explosion of the can 	<ul style="list-style-type: none"> o The risk of fire is related to the type of blowing agent/propellant used and the effectiveness of the ventilation. o In small SFC cans flammable propellants are used, increasing the risk for fire. o Higher risk of fire, since the application volume is higher, hence more flammable propellants present in the air o If the small aerosol cans are stored at elevated temperatures, there is a risk of rupture/explosion of the can

Conclusion

It has to be noted that while both OCF and SFC products are placed on the market, a clear distinction between those two product technologies has to be made. Products containing diisocyanates should be designed as such that during application, the diisocyanate exposure is not higher than the acceptable OELs in the respective countries.

OCF products manufactured by FEICA members and the technology itself are safe and fully compliant with all relevant European standards and regulations in place.

This FEICA position paper has been co-signed by ISOPA, the Association of diisocyanates & polyols producers.



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