

Sioen Fabrics Coating

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PUBLIC PART

Introduction.

Sioen Industries is a diversified stock quoted group (4200 people worldwide) with an extensive portfolio of products and activities: spinning, weaving and coating, manufacturing of clothing, production of fine chemicals and processing of technical textiles. Sioen has different coating activities over Europe and has one production facility for the coating of polyurethanes onto knitted textiles. This coating facility (Sioen Fabrics Coating) is based in Mouscron, Belgium. During the process of polyurethane coating, DMF is used as a solvent.

Short description of the process.

“Sioen Fabrics Coating” purchases TPU granules (thermoplastic polyurethane) and also TPU based solutions (TPU already dissolved in solvent DMF). These TPU granules are dissolved in house at 25% dry matter into DMF. The resulting PU/DMF solutions are coated onto knitted textiles. In this way, waterproof, technical PU-coatings on elastic textiles are produced. The coating machine set up contains 3 coatings heads. Each coating head is capable to apply 1 layer of PU-solution. After each coating head a drying tunnel is installed. In this closed system, the DMF is dried off (evaporation), captured and sent to a scrubber system. The resulting mixture DMF/water is sent to a distillation tower where the distillation process leads to purified DMF that is re-used to dissolve new TPU granules.

Current legislation in place covering the use of DMF (EU and Belgian legislation).

Protection of the workers (EU 98/24/EG and 2009/161/EU)

DMF was included in the third list of indicative occupational exposure limit values (IOELVs) set up by Commission Directive 2009/161/EU. Member states were subsequently required to establish a national occupational exposure limit value. Therefore, this directive properly addresses the occupational use of DMF and health risk in connection with its use.

“Koninklijk besluit van 11 maart 2002 betreffende de bescherming van de gezondheid en de veiligheid van de werknemers tegen de risico's van chemische agentia op het werk”. (Royal Decree from 11/03/2002 concerning “the protection of the safety and health of workers

against the risks of chemical agents used in their working environment”) This regulation is the Belgian implementation of European Regulation 98/24/EG.

In annex I of this Royal Decree, limit values for exposure of the workers to DMF have been defined. It is the obligation of the work provider to assure that these limit values are respected. The limit values within this Royal Decree are mentioned underneath:

| Chemical | Limit value (ppm) | Limit value (mg/m³) | Short time exposure value (ppm) | Short time exposure value (mg/m³) |
|-----------------|--------------------------|---------------------------------------|--|---|
| DMF | 5 | 15 | 10 | 30 |

Limit value = measured or calculated for a reference period of 8 hours (average exposure over 8 hours)

Short time exposure value = value not to be exceeded for an exposure time of maximum 15 minutes

All Sioen Fabrics workers are controlled by an external medical service institute. Urine samples are taken and analyzed by an external lab. The content of Monomethylformamide in the urine is measured and expressed in mg/g Creatinine. The limit value is set at 15 mg/g Creatinine.

Also, blood samples are taken and analyzed at regular time intervals.

Atmospheric measurements of DMF content on the different working stations is also conducted each year.

Further, there is a legal obligation to install a committee for “prevention and protection at work”. This committee consists of representatives from the work provider, the employees, a prevention advisor, a medical doctor and a representative of the Union. All results obtained during the medical follow up of the employees are openly discussed at these meetings.

VOC-directive 1999/13/EC

1999/13/EC is relevant concerning the proper control and limitation of emissions of volatile organic compounds due to the use of organic solvents in certain activities. The coating processes in the textile sector using DMF as a solvent are explicitly covered/mentioned in this regulation. The VOC directive sets a strict emission limit value of 2 mg/Nm³ for VOC discharges containing substances with R61 phrase (as DMF). Further, it obliges that R61 substances should be replaced as far as possible by less harmful substances within the shortest possible time. The textile coatings processes are operated under conditions that guarantee well controlled exposure and monitoring and reporting obligations are part of the VOC directive.

Conclusion:

The use of DMF is well described in the current EU and Belgian legislation. Therefore authorization will not bring any added value concerning the safety of the workers and the environment. The risks concerning the use of DMF are currently already well monitored and controlled, so the only effect will be that Sioen will not be able anymore to put those coatings on the market, as they are produced in Europe.

General actions taken by “Sioen Fabrics Coating” on behalf of safety and environment.

All PU mixing systems are fully performed in ventilated and well enclosed areas assuring that diffuse emissions are limited and all maximum admitted exposure limits are complied with, and even beyond. Even with those precautions, employees are protected furthermore by non permeable clothing and protection masks.

Concerning emissions to the environment, a distillation tower is on place to purify DMF with the purpose of purifying exhaust air and recycling the solvent in the production process. This means that emissions of DMF are extremely low to none and of no relevancy.

Ad hoc formations of the employees to instruct them how to work safely with chemical agents are organized at regular intervals.

Recent investments made in order to ensure employees safety and health:

Year 2008: investment in a ventilation system + fresh air inlet in the PU-formulation preparation halls. This system allows for the air to be completely refreshed 7 times each hour.

Year 2012: investment to optimize the existing after burning system into a state of the art regenerative after burning system. This system allows to treat solvents and to remove the DMA formed during distillation with recovery of the heat released during the burning. The energy released during this process is used in the production process ensuring max emissions being well below European legislation.

Conclusion:

Sioen Fabrics continuously invests in the safety of his people and in the environment. People are trained and made aware how to work in the most safest way with DMF.

Competition from non-EU countries/economical consequences.

Since the last 10 years there is a very strong competition from non EU-countries (Far East and others) who deliver equivalent technical PU-coatings on textiles. Due to long experience and long term strategic R&D efforts, Sioen Fabrics has been able to maintain its position into these markets. Typically, these non-EU countries have production processes that are also fully based on the DMF process. In the final article (PU coated textile), DMF is still present (sometimes in trace amounts or sometimes even above the Reach 0,1% communication limit). When the use of DMF would no longer be allowed at Sioen Fabrics, this would mean that we have to use alternative processes which are on an economical scale disadvantageous for the company and furthermore would be technically inferior compared to the EU-import based on DMF-process. One of the options to overcome this competitive disadvantage would be a delocalization of the coating facilities to a non-EU country. If this way is not chosen, there is a very high probability that Sioen Fabrics Coating will have to shut down, leading to the loss

of 120 employees. In addition, EU-suppliers to Sioen Fabrics Coating (PU suppliers in Italy, Germany, knitting suppliers in Belgium, France, Germany,...) will also lose considerable sales volumes, leading them to shut down or significantly reducing their production capacities, as Sioen is a major player in fabrics coating.

Restriction or authorization

Sioen Fabrics is of the opinion that restriction , which can apply to goods produced in EU and to goods imported from outside the EU, is a better way of protecting the consumer than authorization.

In the authorization scenario, a risk may exist that imported goods come into the EU containing considerable amounts of residual DMF. This may potentially lead to a non-controlled exposure of the end consumer to residual DMF.

If there is no support to go for the restriction scenario, Sioen Fabrics is of the opinion that enough specific community legislation is in place already to allow an exemption from authorization for the use of DMF in the textile coating industry (on the base of article 58(2) of the Reach Regulation).

General conclusion.

Current EU and Belgian legislation are very strict which means that the use of DMF is very well controlled and monitored. All possible measures concerning the safety of the employees are taken and continuous investments to do even better than what is asked by law are part of the company philosophy. On behalf of environmental impact (for example emissions into the environment) of production processes, Belgian law is also very stringent, resulting in the fact that Sioen recently invested considerable amounts to ensure the safety of people and environment. The whole DMF based production process is controlled in that way that there are virtually no emissions from DMF to the environment, nor that diffuse emission could lead to unacceptable concentrations in the production environment.

From a technical/economical point of view there are no valid alternatives for the DMF-process. All other processes are first of all technically not feasible or far too expensive to be competitive as they need considerable investments and require more energy consumption. Taken together with the fact that the established technology is based on DMF and that non EU-countries also use DMF based processes, this would lead to a non-competitive situation if the use of DMF would be forbidden in Europe. This situation will lead to delocalization or shut down of Sioen Fabrics Coating and other Belgian companies working with the DMF-process.