CIRFS
European Man-made Fibres Association

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CIRFS general comment to the draft recommendation to list DMAC under Annex XIV (authorization) September 18, 2012

Executive summary (see general comment in the webform)

1. General comments

CIRFS - European Man-made Fibres Association, would like to generally comment on the elements related to the man-made fibre (MMF) sections of the draft recommendation of June 20 for DMAC, and more specifically to the disproportionate recommendation for a prioritized authorization.
The CIRFS comments have to be seen as a summary view on the MMF industry using DMAC, and refers to the sum of all fibres concerned (acrylic, elastane and m-aramid), unless otherwise mentioned. For more specific information per fibre type, or producer, CIRFS refers to the specific (partially confidential) comments supplied by the MMF producers. Due to the small number of involved companies, this cross-referencing is required to maintain confidentiality of market and process information and to comply with EU competition law.

CIRFS is the industry's representative association in Europe. The European man-made fibres industry is the second-largest producer of man-made fibres in the world, and a global leader in innovation, quality and sustainable production methods according national and European legislation. CIRFS has about 40 members, representing 85% of the European MMF industry. DMAC is used for the production of acrylic, elastane and meta-aramid fibres. CIRFS members using DMAC are dralon (Germany), Fisipe (Portugal), Montefibre and DuPont (Spain). Data were also provided in the DMAC working group by Invista (UK) and Asahi Kasei (Germany). These are the only producers in the EU we are aware of, using DMAC for MMF production.

1. Regarding the use of DMAC

1. 1. The use of DMAC at MMF industry

<u>The use at MMF production is an adequately controlled industrial use.</u> DMAC is industrially and safely used throughout the industry and depending on the type of fibre, DMAC is used as a solvent for the polymerization reaction, as polymer solvent (dope preparation) and as part of the spinning solution.
Most notably, CIRFS wants to insist that the acrylic fibre volumes mentioned in the dossier to include DMAC in Annex XV are not correct. The acrylic fibre figures in the dossier relate to greater Europe and are about 3 times higher than the volumes produced in EU 27. This is also valid for the DMAC volume used to produce the fibres, which was about 2.6 kton in 2011. The total fibre production for that year is about 200 kton, of which 127 kton is exported. About 37 kton of fibre is imported. The volume of fibres converted in the EU for which DMAC has been used, is 110 kton (assuming all imports are also DMAC based).
For DMAC, a SVHC having an indicative Occupational Exposure Limit value (i-OEL) according Commission Directive 2000/39/EU of 8 June 2000, the industrial use is very well regulated by existing legislation and production permits and is regularly controlled by the authorities. This results in adequate control and minimized risk of exposure for the operators and for the environment.

- Protection of the operators
Rigid risk management measures are implemented. The industrial processes are controlled, monitored and appropriate procedures and measures are in place to protect the operators at the different process stages

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of the process and during the different kind of operations (normal, stop/start, cleaning, maintenance or calamity). This includes in random order and not exhaustive; workplace measurements, (follow-up) bio-monitoring, check against the no-effect levels on health (DNEL), operator circulation over different workplaces, education, etc.

This minimized risk is also confirmed by published risk assessments (e.g. SIDS, 2001 and Health Canada, 2009) having not identified DMAC as a priority for additional study since it is produced for industrial use with limited exposure for man and the environment. Moreover, it is recognized that for substances having a threshold concentration, that there is no evidence for health effects if the threshold is not exceeded. This is also expressed by the ECHA score, allocating a zero prioritization scoring to DMAC for intrinsic effects with reference to this threshold for reproductive effects which recognizes that it is very well possible for DMAC to be used safely.

We want to emphasize that the iOEL of 10ppm addresses the highest sensitivity endpoint which is irritation of the respiratory tract. Based on scientific information, a DNEL for reproductive toxic effects would be much higher. As stated in the SCOEL recommendation "Reproductive toxicity has not been observed in inhalation studies at levels which do not cause maternal toxicity (Ferenz and Kennedy, 1986; Wang et al, 1989). MMF industry is meeting the established i-OEL (respiratory tract) requirements and by that automatically meet a repro DNEL bearing in mind that reproductive toxicity being the reason to put DMAC on the SVHC list.

- Protection of the environment

According to existing legislation and permits, all DMAC uses and emissions are reported to the national authorities. The DMAC used during the fibre production can be split over 5 categories, resulting in a closed mass balance from what comes in and what comes out.
The DMAC use at MMF production level is split into:

- emission to the biological water treatment, resulting in negligible volumes going into surface water,
- emission to the air, meeting the environmental permits,
- use in the process (as distillation by-product, due to hydrolysis),
- emission as waste. Mainly being a result of maintenance and cleaning, and product waste, are all disposed according authorized waste processing systems, bringing no DMAC into the environment. A typical example in Germany is the acrylic waste being authorized as an incinerator fuel,
- DMAC residual or production impurity imbedded in the fibre.

In Annex I, the different steps relevant for the different fibres are given including the risk minimization measures for both operator and environment. For more details and evidence on protection of operators and environment reference is made to the confidential comments of the MMF producers.

1.2. There is no use of DMAC in the fibre further down the value chain, where DMAC is only present as a production impurity.

The fibres, as produced, do contain very small volumes of DMAC, which are imbedded in the polymer as an impurity.
Most notably, CIRFS is not aware of greige fibres having up to 3% of residual DMAC produced in Europe, as reported in the draft recommendation on page 4.
The average residual DMAC content of all products is 0.25%. A very minor volume has a residual content of 1 to 1.2%, having a maximum specification limit of 2%.
It can historically be that the data sheets mentioned 3%, to be on the safe side – from a product description point of view, yet substantially below the classification threshold of 5% for mixtures. Risk considerations

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should be based on the practical average of 0.25% DMAC as a residual, when leaving the MMF operation, and not at the 3% level as mentioned before, as this kind of MMF is not produced in EU27.
Of the 200 kton (2011) of all fibres produced in Europe, only 110 kton of fibre (EU production and import) are converted in Europe. Downstream manufacturers (converters handling this 110 kton of fibre) are not using DMAC and are as such not within the scope of the REACH authorisation. The MMF industry is fully aware of the presence of the residual DMAC as an impurity in those fibres and consequently has taken care of a possible exposure of the workers at converter level. MMF producers provide data sheets on product safety of MMF, referring to the presence of DMAC as a residue and the measures that have to be taken during converting. Measurements within many areas of the fibre converting industry, done by IFA; the German Institute for Occupational Safety and Health of the German Social Accident Insurance over the years 2000-2011 have shown that over that decade, not a single measurement was above the established MAK (maximum workplace concentration), which is the same level as the IOELV, with a vast majority of the results even being below the limit of quantification of 0.3 mg/m3. See
http://www.dguv.de/ifa/de/fac/reach/mega_auswertungen/N_N_Dimethylacetamid_inTextilindustrie.pdf
This should certainly take away the concern of the draft recommendation.
Also the OECD report on page 9 and 11, say that there is no risk, and that OEL are met at converter and end-user level.

1.3. The use is not wide-dispersive

The use at MMF is certainly not wide-dispersive, and is limited to only six DMAC users for the production of acrylic, elastane and meta-aramid fibres.

Conclusions regarding the use of DMAC

- Depending on the type of fibre, DMAC is industrially and safely used as a solvent for the polymerization reaction, as a polymer solvent (dope preparation) and as part of the spinning solution. The industrial use at MMF of DMAC being a SVHC having a GHS threshold level is very well regulated by existing legislation and adequately controlled. The industrial processes are controlled, monitored and appropriate procedures and measures are in place to protect the operators (meeting i-OEL requirements) and the environment at the different process stages and during the different kinds of operations (normal, stop/start, cleaning, maintenance or calamity).This all results in minimized risk of exposure for the operators and environment.

- There is no use of DMAC in the fibre further down the value chain, where DMAC is only present as a production impurity embedded in the polymer. CIRFS is not aware of fibres having up to 3% of residual DMAC. The average residual content imbedded in the fibre is 0.25%. The MMF industry is fully aware of the presence of the residual DMAC as an impurity in the fibre and the potential exposure of the workers at converter level. MMF producers provide data sheets on product safety of MMF, referring to the presence of DMAC as a residue and the measures that have to be taken during converting. Measurements at converters, done by IFA Germany, have proven there is no risk.

- The use at MMF is limited to only 6 producers, the use is not wide-dispersive.

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2. Prioritization

To comment on the prioritization of DMAC we took into consideration the following documents:

- The draft background document of 20 June 2012 giving the prioritization score;
- ECHA document ECHA/MSC-23/2012/034 (Non-Confidential Version) dated 13 April 2012;
- ECHA document of 28 May 2010 "General Approach for Prioritisation of Substances of Very High Concern (SVHCs) for Inclusion in the List of Substances Subject to Authorisation".

2.1. Intrinsic properties

Although DMAC received a zero prioritization score for its intrinsic properties we would like to comment on it.
Priority shall normally be given to substances with PBT or vPvB properties, which are criteria that DMAC does not fulfil. DMAC is classified as toxic for reproduction 1B, having threshold values (i-OEL) which are respected in MMF industry across Europe. We want to emphasize that the iOEL of 10ppm addresses the highest sensitivity endpoint which is irritation of the respiratory tract. Based on scientific information, a DNEL for reproductive toxic effects would be much higher. As stated in the SCOEL recommendation "Reproductive toxicity has not been observed in inhalation studies at levels which do not cause maternal toxicity (Ferenz and Kennedy, 1986; Wang et al, 1989). MMF industry is meeting the established i-OEL (respiratory tract) requirements and by that automatically meet a repro DNEL bearing in mind that reproductive toxicity being the reason to put DMAC on the SVHC list.

As also indicated in 1.1., it is recognized that for substances having a threshold concentration, there is no evidence for health effects as long as the threshold is not exceeded.
CIRFS recognizes that exceptions to the criteria may occur, but would like to stress again that DMAC use on industrial sites (or inside industrial installations) is very well controlled and that occupational exposure meets the limits being set. In addition, regarding the environment, DMAC is readily biodegradable and described as not harmful to the environment. The combination of both situations regarding, exposure and environmental, makes it hard to understand why DMAC is so highly prioritized. See also 2.2. and 2.3.

2.2. Wide-dispersive use

Criteria for wide-dispersive use are the number of sites and release, as described in 2.2.2. of ECHA document of 28 May 2010 "General Approach for Prioritisation of Substances of Very High Concern (SVHCs) for Inclusion in the List of Substances Subject to Authorisation".

2.2.1 Number of sites

The use of DMAC at MMF level is limited to six production locations (<10). As explained in 1.2 there is no further use of DMAC further down the value chain. Further down the value chain, DMAC is only present as a residual impurity embedded in the polymer.

However, the ECHA document supporting prioritization of DMAC for inclusion in Annex XV identifies the number of sites involved in the use of DMAC as follows: fibre production 1-10, fibre processing 100-1000, textiles production (DMAC typically very low): >1,000. This statement is clearly misleading when building up the score as it ignores that there is no use of DMAC in the referenced value chain.

Looking at the term "wide-dispersive use", as described in the document of 28 May 2010 and the different explanations and criteria which are given, we can say that wide-dispersive use is not applicable to MMF.

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- Referring to the formulations in Chapter R.16.2.1.6 of the Guidance on Information Requirements and Chemical Safety Assessment, MMF are concerned at only six production locations and the use is controlled and in line with environmental permits (see above).
- Referring to the criteria of the Technical Guidance Document for Risk Assessment of new and existing substances and biocides (2003, Chapter 5), MMF has no activities having uncontrolled exposure.
- Referring to ECETOC Report No. 93. DMAC is only present in the fibre and at very low concentrations, as an impurity imbedded in an article, resulting in no significant release or negligible release with no risk to the environment (see also 2.2.2). DMAC is industrially used at a limited number of MMF sites (six) and we assume there will also be a limited number for the other industrial applications. Taken together with the information of other industry sectors, we trust that ECHA will come to a lower score for the industrial applications.

2.2.2. Release

According to the document of 28 May 2010 "General Approach for Prioritization of Substances of Very High Concern (SVHCs) for Inclusion in the List of Substances Subject to Authorization" describing the general approach for prioritization, the potential for releases to the environment for worker exposure and for consumer exposure in all steps of the life-cycle is considered. As DMAC is a CMR, the focus is on potential human exposure (worker, consumer and man indirectly exposed via the environment).
The score of 3 refers to "diffuse/uncontrolled/significant".
We however strongly believe that the DMAC release at MMF level, and most likely for the other industrial uses, is "non-diffuse/controlled".

- At MMF level

We refer to the information in 1.1, where it is clearly stated that adequate measures have been taken to protect operator and environment according existing legislation.

- At converter level

As produced, the fibres do contain very small volumes of DMAC, which is imbedded in the polymer as an impurity. CIRFS is not aware of greige fibres having up to 3% of residual DMAC produced in Europe, as reported in the draft recommendation on page 4. The average residual DMAC content of all products is 0.25%. MMF producers provide data sheets on product safety for MMF, referring to the presence of DMAC as a residue and the measures that have to be taken during converting.
The converting processes consist of two groups: mechanical (dry) processes and wet processes (washing and dyeing).

- Mechanical processing

All fibres, greige or already dyed at the MMF level go through a mechanical processing (mechanical spinning, twisting, knitting, weaving, etc.) to be converted in other articles, needed to make the final garment or textile end-product. Inhalation exposure to DMAC is possible during the mechanical converting, but so far there is no reason to assume that OEL are not met. See OECD SIDS 2001 on page 11.
Measurements within many areas of the fibre converting industry, done by IFA; the German Institute for Occupational Safety and Health of the German Social Accident Insurance over the years 2000-2011 have shown that over that decade, not a single measurement was above the established MAK (maximum workplace concentration), which is the same level as the IOELV, with a vast majority of the results even being below the limit of quantification of 0.3 mg/m3. This should certainly take away the concern of the draft recommendation.

- Wet processing

Almost all fibres are dyed. The dyeing occurs directly at MMF production level (about 15% of the volume) or at the dyer (about 85% of the volume).

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The fibres directly dyed at MMF level can be dope dyed (pigment dissolved in the dope) or dyed during spinning. This in-house dyeing is seen as an industrial process being environmentally friendly as it avoids the use of substantial volumes of water and chemicals needed during the conventional dyeing process. The residual content, in doped dyed fibres is in general below or equal to about 0.1%. Almost the entire amount of dope dyed fibres goes into outdoor or technical applications, with no direct continuous consumer contact.
For the fibres dyed at the dyeing converter level, results show that DMAC is washed out and reduced to very low levels. The residual DMAC level in the dyed fibre has then dropped to levels of 0.01% and in most cases below this level.
The DMAC which is washed out is being treated by the converters biological waste water treatment. This very low level means that at the next converting stages, which in general take place with the garment manufacturer and textile producer, and at consumer level virtually no DMAC is present anymore.
Moreover, it has to be observed that many of the fibres for which DMAC has been used are mixed into so-called fibre blends with other fibres (cotton, polyester, etc.) containing no DMAC at all. This further reduces the already very low DMAC content in the final textile.

A very minor volume of the greige fibre is not going to wet converting processes and is used as such in textile products. It can be that this greige fibre is going through a hot-melt process with other articles resulting in very low residual DMAC levels in the end-product, and where emissions are handled according the measures to be taken for hot-melt processing. Although the residual DMAC content of the greige fibre is higher (average 0.25%) compared to dyed fibres (<0.01% to not detectable) it is not expected that the risk factor at consumer level will be exceeded, as the DMAC is embedded in the polymer matrix. Nevertheless, and to be on the safe side, some data sheets on product safety of MMF recommend washing at higher temperatures.

- At the garment manufacturer and consumer
See also information at the converter stage, where DMAC is in general already strongly reduced to very low levels.
See also the 2001 OECD SIDS report on page 9 stating that consumer exposure is negligible as a result of migration tests with simulated sweating on textile articles containing residual DMAC. This is also confirmed by model calculations done by some MMF, resulting in risk factors which are much below the “DNEL worker dermal” and the “DNEL general population dermal”.

Likewise, we refer in this respect to Annex I where the different steps of MMF production, converting and end-use are given including the risk management measures resulting in adequate control. We also make reference to the CIRFS document of November 2011 submitted to ECHA regarding inclusion of DMAC in Annex XV. In this document all the emissions for MMF are given for the year 2010. They are all in line with environmental legislation and permits. The permits should also guarantee that potential exposure for humans via the environment is adequately controlled. For evidence regarding release and exposure we refer to the confidential comment of MMF producers.
We therefore conclude that the release at MMF production level and further down the value chain is non-diffuse/controlled, and assuming that the other industrial uses are quite similar, this should result in a score 1 or 2 for the industrial applications.

2.3. Volume
The yearly volume of DMAC used in MMF production is estimated to be about 2.6 kton and is much lower than the volumes mentioned in the dossier for Annex XV. These were not correct, especially the mentioned production volumes for acrylic fibres. The dossier fibre figures relate to greater Europe and are much higher (three times higher) than the volumes produced in EU27. The total fibre production (acrylic, elastane and m-aramid) in EU27 using DMAC is only about 200 kton. The trade balance for all fibres is positive (much

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more export than import), resulting in a volume converted in EU27 for 2011 of about 110 kton only for all these fibres.

Conclusion regarding the prioritization score

CIRFS sees no reason for this high prioritization, because:

- DMAC is a CMR, toxic for reproduction 1B having a threshold, and is not a PBT or vPvB. It is recognized that for substances having a threshold concentration, there is no evidence for health effects if the threshold is not exceeded. MMF industry is respecting the threshold. DMAC is readily biodegradable and is described as not harmful to the environment. (Score 0)

- There is no widespread use related to the MMF industry and there are no concerns neither at the producers of fibers nor at the value chain during processing the fibers. The number of production sites is only six (score 1), the DMAC release at MMF production level is "non-diffuse/controlled" (score 1). Both considerations are expected to be very similar at other industrial uses.

- The volume used is about 2.6kton/year. (score 7)

We believe that these conclusions for MMF, assumed to be very similar for other industrial processes, should allow ECHA to recalculate the score, which should result in a lower number for prioritization.

3. There is no alternative

Depending on the type of fibre (acrylic, elastane, m-aramid), DMAC is industrially and safely used as polymerization solvent, polymer solvent, and in the spinning solution. The choice for DMAC is based on its aprotic properties needed for the above mentioned uses. There are several aprotic solvents which could have been, or can be chosen. However, they all have, all being aprotic solvents, in general the same toxicological properties. No real improvement regarding toxicological properties can be made . The choice of DMAC as a solvent by the above listed MMF producers has been considered very carefully, based on the specific chemical/technical and health/environment related properties.
As all "alternative" solvents have relatively similar properties (apart from some physical properties such as boiling points) they are -in principal- interchangeable. However, this would only be the fact in theory, as it would result in a complete re-engineering (i.e. new construction and investment) of the existing installation, and it will (more than likely) result in different properties of the fibre. Above all, no additional step will have been made as to health and safety.
Regarding the chemical installation, completely new layouts of the almost complete installation will have to be thought about, including recycling (solvent recovery). Regarding the fibre properties it is more than likely that it will result in costly re-approvals at many stages of the value chain or loss of business.
For specific information on the alternatives for the different fibres see reports by MMF producers.

Aprotic solvents are bulk chemicals being used since many, many years, and it is very unlikely that similar new solvents having safer properties will become available in a foreseeable future. In this respect, the obligation to continuously look for alternatives is disproportionate. In case proper alternatives might appear, new fibre investments based on this alternative will very likely not be in Europe.

Conclusion regarding alternatives

The solvents listed in 2.3 of the draft recommendation to Annex XIV are no alternatives as there is none with lower health risk.
Moreover, the use of these would result in different properties, re-building of the production operation, making operations economically unfeasible. The obligation, being part of the authorization process, to continuously look into alternatives is disproportionate.

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4. Authorization is disproportionate and creates a competitive distortion for EU industry

DMAC is used for about 90% in industrial applications, because of its specific chemical properties in chemical production processes, which are adequately controlled. The MMF industry is one of these industries, having implemented adequate control and monitoring measures, including regular reporting to authorities, and this for many years.
As DMAC is a reprotoxic 1B, having a GHS threshold level for classification and labelling, the industrial/chemical use is very well regulated by existing legislation. As stated, this results in adequate control and minimized risk of exposure for the operators. If the i-OEL is met, there is no health risk.
The i-OEL of 10ppm addresses the highest sensitivity endpoint (irritation of the respiratory tract) and is estimated to be stricter than a DNEL for reprotoxic effects, which is the reason for putting DMAC on the SVHC list.
DMAC is readily biodegradable and is described as not harmful to the environment.
According to our opinion, the use at MMF, and very likely at the other chemical industry as well, is not wide-dispersive.
The remaining uses will be mainly consumer and professional uses where these strict regulations are difficult to implement and control.

DMAC is a residual impurity in the fibre, embedded in the polymer, which is mainly removed by the washing and dyeing processes and treated in accordance with environmental permits, a.o. biological waste water treatment. Potential risk related to airborne DMAC emissions from some fibre types is considered to be low and appropriately manageable by air management at the converting operations. The converters of the fibre receive data sheets on product safety, referring to the presence of DMAC as residual and the measures that have to be taken during converting. It was and is believed that the residual content does not represent a risk, which is proven by measurements done by IFA; the German Institute for Occupational Safety and Health of the German Social Accident Insurance over the years 2000-2011 which show that over that decade, not a single measurement was above the established MAK (maximum workplace concentration), which is the same level as the IOELV, with a vast majority of the results even being below the limit of quantification of 0.3 mg/m3. This should certainly take away the concern of the draft recommendation..The inclusion of DMAC in Annex XV, and the recommendation to include it in Annex XIV, which means applying for authorization, which is granted for a limited period of time influences the marketing situation strongly, because of the huge uncertainty it creates for the customers of the European MMF producers concerned.
CIRFS estimates that the main benefit from a health point of view, which is the main goal of REACH, will not be achieved by high prioritization for authorization of DMAC. The high score for prioritization is not caused by MMF production, and very likely not by other industrial sectors using DMAC
Taking the above arguments into consideration, a targeted restriction to prevent professional or consumer use of DMAC will result in an efficient management of risk. Therefore CIRFS pleads for a EU-wide restriction on consumer and professional use of DMAC.

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Annex I

Generic overview of the different steps that might be relevant for the different fibres including risk minimization measures. For more details and evidence (meeting the permits, audit documents, internal documents) reference is made to the confidential comment of the man-made fibre producers.

At MMF industry

Different steps	Description	Risk minimization measures (not exhaustive)
DMAC delivery and acceptance DMAC storage	Tank-car, unloaded in storage silo Controlled storage silos and fixed piping to different steps in the operation	Procedures and instructions for operators in place, PPE required. Installation according permits , regular inspection of installations
Polymerization (if applicable) Polymer dissolution in DMAC (preparation of spinning dope)	Synthesis reactions; dissolution tanks, mixers, heat exchangers continuously metered and monitored, going through filtering systems to spinning operation	Procedures and instructions for operators in place. Cleaning and maintenance according internal procedures. PPE required Installation according permits, regular inspection of installations.
Wet spinning; DMAC used in spinning bath for coagulation of the dope Dry spinning	Spinning solution pressed through spinnerets into coagulation bath. The solidification is achieved through evaporation of the solvent. This is usually achieved by a stream of air or inert gas. Because there is no precipitating liquid involved, the fibre does not need to be dried, and the solvent is more easily recovered	Air is monitored in the workplace. Controlled powerful air suction. Operators instructed about the risk measures that have to be taken. PPE required. Bio-monitoring and actions taken if necessary. Operator circulation over different workplaces
Washing of the fibre Drying of the fibre	DMAC is removed from fibre by washing with hot water (counter current flow) and the fibre passes a number of heated rolls to evaporate the remaining water	Controlled powerful air suction. Operators instructed about the risk measures that have to be taken. PPE required. Bio-monitoring and actions taken if necessary
Distillation and DMAC recovery	Recovery of DMAC from washing water.	Procedures and instructions for operators in place. Cleaning and maintenance according internal procedures. PPE required. Installation according permits, regular inspection of installations.

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Emissions	DMAC used in the process, emitted to the air, water, as waste and is present as a low residual embedded in the fibre.	Emission meeting the environmental permits. Audits by authorities and third parties.

At converters

The use, according REACH definition 24, at MMF industry (6 production locations) is limited to the production of the fibre according to the processes described above, and there is absolutely no further use at the converters. DMAC is however present as an imbedded residual in the fibre as sent to the customer (downstream user) for further processing at an average concentration of 0.25%. MMF is fully aware of residual levels being present in the fibre as an impurity from the process for making such fibres. Customers in the fibre processing industry are informed by data sheets on product safety of the fibre. Measurements at different converting steps (see German IFA report over 2000-2011) have proven there is no risk for operators. This is also confirmed by some model calculations for converting and end-users. . See also OECD report on page 9 and 11. After having passed the dyeing processes at converter level, the residual content at consumer level is significantly below the 0.1% threshold of notification of an SVHC impurity content (at 0.01% and even lower).

Different steps Downstream User	**Description**	**Information and measures taken**
Mechanical converting like spinning of short fibre, twisting, stretching, weaving	The fibre has to be converted in a different shape or article e.g. fabric in order to be able to be used	It concerns industrial users, data sheet on product safety are made available. For some fibre types, model-measurements and calculations have been made, showing there is no risk. This will be extended with exposure scenarios.
Physical/chemical processes like dyeing	The mechanically converted fibre, e.g. fabric, is dyed	It concerns industrial users, data sheet on product safety are made available.

The different fibres are finally ending in a wide range of end-uses. According to measurements and model calculations made for some fibres, the exposure risk at consumer level is significantly below the DNEL, even with a maximum content of DMAC and extreme use conditions. See also OECD report page 9 and 11.
For more specific information per fibre type, see the confidential comment of MMF.