



*Miroglio Textile*  
*APEO Investigation Report*  
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**Miroglio Textile**

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## **1 APEOs in textile processes**

Alkylphenol ethoxylates (APEOs) are a group of nonionic surfactants, the most commonly used being nonylphenol ethoxylates (NPEOs) and octylphenol ethoxylates (OPEOs).

The chemical structure of these molecules makes them particularly useful in textile industry wet processes (owing to their dispersant, detergent and emulsifying action), but particularly hazardous for the environment and for aquatic organisms.

Recent research confirms that APEOs are potential endocrine disruptors, as well as being highly bio-accumulative and persistent. APEOs contamination has been detected in riverbeds, water tables and even in the human food chain.

APEOs are already subject to restrictions in Europe where since January 2005, the EU 2003/53/EG directive has prohibited the use of the main group of APEOs, the NPEOs, in concentrations greater than 0.1% in chemical intermediates. The presence of this group of substances in the processes of European companies and the final products can however be induced by the use of semi-finished produced in countries where the use of APEOs is allowed.

To safeguard the health and safety of consumers, producers and local communities, Miroglio Textile starting from July 2014 has introduced the ban on APEOs the Manufacture Restricted Substances List (M-RSL) that suppliers are required to comply with.

In line with its Greenpeace Detox Commitment, Miroglio Textile conducted an investigation into APEOs usage in its products and in the supply chain to map the current situation.

## **2 Overview of Miroglio Textile processes**

**Miroglio textile Srl** is a manufacturer of printed textiles specialised in printing fabrics and knitwear in cotton, polyester, cupro, modal, wool, acrylic, nylon, viscose, polyamide, linen, silk and mixtures with elastomer.

Main facilities are located in:

- Govone and Castagnole Lanze, dealing with:
  - Traditional printing with reactive dyes, pigments, acid and basic chemicals, and a fully-equipped internal cylinder engraving unit employing traditional laser and ink-jettable wax techniques alike.
  - Ink-jet printing with printing reactive, disperse and acid dyes

- The Transfer facility of Alba, is specialised in the printing or application of decorations to cellulose material or to plastic film which are then transferred by customers on a variety of final materials: fabric, leather, wood, metal.
- Filature Italiana in Boumerdes specialises in discontinuous spinning and produces yarns from cotton, synthetic, artificial and natural fibres.

Possible ways APEOs can find their way into Miroglio textile Srl products are chemical auxiliaries, namely in formulation of:

- lubricants;
- antistatic agents;
- dispersants;
- emulsifiers;
- silicon based softeners;
- levelling agents;
- surfactants;
- and auxiliaries with high content of dispersants or emulsifiers.

Some of these auxiliaries were APEOs could potentially be used to improve the functional performances, are directly used in Miroglio textile Srl own processes, although the Company selects these chemicals and its suppliers in order to avoid their use.

APEOs can however be found on yarns and textiles, especially in raw materials sourced in Countries where the use of APEOs is allowed<sup>1</sup>. The risk is especially high in the first stage of fibre production as APEOs can be found in surfactants formulations used for scouring greasy of wool and in the degumming of raw silk.

Lubricants; antistatic agents; dispersants; emulsifiers; silicon based softeners; levelling agents; surfactants; and other auxiliaries with high content of dispersants or emulsifiers can also be used in wet processing by our suppliers (*yarn dyeing, fabric dyeing, and other wet finishings*). All of our suppliers of wet processes are based in Italy, thus subject to the APEOs European regulation, that however can be used, in some formulations of dyestuffs or chemical auxiliaries, even though the use is not disclosed by dyestuffs or chemical auxiliaries suppliers.

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<sup>1</sup> In Europe, the use of NPEO has been banned or voluntarily restricted since 1986. Since 1998, the use of APEO in detergents has been forbidden in Germany – and since January 2005 the EU directive 2003/53/ EG has forbidden the use of NPEO in higher concentrations than 0.1% in product formulations.

### **3 APEOs use in the company**

Consistent with the Detox commitment signed in 2014, Miroglio Textile carried out a fact-finding investigation to check if any APEOs enters, intentionally or unintentionally, in the supply chain.

First step was to implement, water testing at the two Miroglio Textile main facilities by an independent certified Lab, to gather data on the existence of the 11 DETOX priority chemical groups, including APEOs, in the facilities' effluent water.

Process discharge water and dewatered water sludge of our water treatment plants was tested, on 02/Jul/2014, 23/Jan/15 and 24/Apr/15. Collection points were at our water treatment plant inflow collector for discharge water and at the belt filter press for dewatered water sludge. Results of the testing are summarized in the table below.

Pass level defined according the following LOD:

Table 1 - Water sludge tests <20 mg/kg, Method ISO 18857:1-2005 + EPA 8270 D 2007

Table 2 - Discharge water tests <1,0 µ/l, Method ISO 18857:1-2005 + EPA 8270 D 2007

Full testing evidence is available in the Miroglio Textile website:

<http://newmirogliogroup.nohup.it/wp-content/uploads/2015/10/2014-settembre-miroglio.pdf>

[http://newmirogliogroup.nohup.it/wp-content/uploads/2015/10/2015-febbraio\\_miroglio-105134\\_2015.pdf](http://newmirogliogroup.nohup.it/wp-content/uploads/2015/10/2015-febbraio_miroglio-105134_2015.pdf)

[http://newmirogliogroup.nohup.it/wp-content/uploads/2015/10/2015-maggio\\_miroglio\\_107343\\_353\\_2015.pdf](http://newmirogliogroup.nohup.it/wp-content/uploads/2015/10/2015-maggio_miroglio_107343_353_2015.pdf)

Tests were "Pass" for all APEOs in all samples. Thus the tests provided evidence that no APEOs are used in Miroglio Textile processes.

Table 1 - Water sludge tests

Name	CAS N.	Govone facility			Guarene facility		
		02 Jul 2014	23 Jan 2015	24 Apr 2015	02 Jul 2014	23 Jan 2015	24 Apr 2015
4-(1,1,3,3-Tetramethylbutyl)-phenol	140-66-9	pass	pass	pass	pass	pass	pass
Octylphenol	27193-28-8	pass	pass	pass	pass	pass	pass
4-Nonylphenol	25154-52-3	pass	pass	pass	pass	pass	pass
Nonylphenol	104-40-5	pass	pass	pass	pass	pass	pass
Nonylphenol	90481-04-2	pass	pass	pass	pass	pass	pass
4-Nonylphenol (branched)	84852-15-3	pass	pass	pass	pass	pass	pass
Nonylphenol	1173019-62-9	pass	pass	pass	pass	pass	pass
Nonylphenol ethox. NPEO(1-2)	various	pass	pass	pass	pass	pass	pass
Nonylphenol ethox. NPEO(3-18)	various	pass	pass	pass	pass	pass	pass
(Nonylphenoxy)-polyethylenoxid	9016-45-9	pass	pass	pass	pass	pass	pass
4-Nonylphenol, ethoxylated	26027-38-3	pass	pass	pass	pass	pass	pass
(NPEs 3-18) Poly(oxy-1,2-ethanediyl), .alpha.-(nonylphenyl) -.omega.-hydroxy-, branched	68412-54-4	pass	pass	pass	pass	pass	pass
4-Nonylphenol, branched, ethox.	127087-87-0	pass	pass	pass	pass	pass	pass
Unbekanntes Farbmittel 94 (SIN list Isononylphenol-ethoxylate)	37205-87-1	pass	pass	pass	pass	pass	pass
Octylphenol Ethox. OPEO (1-2)	various	pass	pass	pass	pass	pass	pass
Octylphenol Ethox.OPEO (3-18)	various	pass	pass	pass	pass	pass	pass
9opes 3-18) alpha-[4-(1,1,3,3--)	9002-93-1	pass	pass	pass	pass	pass	pass
4-tert-Octylphenoethoxylate	9036-19-5	pass	pass	pass	pass	pass	pass
4-tert-Octylphenoethoxylate	68987-90-6	pass	pass	pass	pass	pass	pass

Table 2 - Discharge water tests

Name	CAS N.	Govone facility 23 Jan 2015	Guarene facility 23 Jan 2015	Guarene facility 24 Apr 2015
4-(1,1,3,3-Tetramethylbutyl)-phenol	140-66-9	pass	pass	pass
Octylphenol	27193-28-8	pass	pass	pass
4-Nonylphenol	25154-52-3	pass	pass	pass
Nonylphenol	104-40-5	pass	pass	pass
Nonylphenol	90481-04-2	pass	pass	pass
4-Nonylphenol (branched)	84852-15-3	pass	pass	pass
Nonylphenol	1173019-62-9	pass	pass	pass
Nonylphenol ethoxylates NPEO(1-2)	various	pass	pass	pass
Nonylphenol ethoxylates NPEO(3-18)	various	pass	pass	pass
(Nonylphenoxy)-polyethylenoxid	9016-45-9	pass	pass	pass
4-Nonylphenol, ethoxylated	26027-38-3	pass	pass	pass
(NPEs 3-18) Poly(oxy-1,2-ethanediyl), .alpha.-(nonylphenyl)-.omega.-hydroxy-, branched	68412-54-4	pass	pass	pass
4-Nonylphenol, branched, ethoxylate	127087-87-0	pass	pass	pass
Unbekanntes Farbmittel 94 (SIN list Isononylphenol-ethoxylate)	37205-87-1	pass	pass	pass
Octylphenol ethoxylates OPEO (1-2)	various	pass	pass	pass
Octylphenol ethoxylates OPEO (3-18)	various	pass	pass	pass
9opes 3-18) alpha-[4-(1,1,3,3--)	9002-93-1	pass	pass	pass
4-tert-Octylphenoethoxylate	9036-19-5	pass	pass	pass
4-tert-Octylphenoethoxylate	68987-90-6	pass	pass	pass

#### 4 APEOs use by suppliers

Whereas testing on water sludge and water discharge at main facilities proved that no APEOs enter in the processes Miroglio Textiles began an investigation on the use of APEOs by suppliers in 2015. Two investigation methods were implemented:

- Systematic testing on purchased fabrics
- Questionnaire survey to global suppliers

##### 4.1 Systematic tests on purchased fabrics

###### 4.1.1 Methods

A product testing campaign has been implemented on purchased fabrics, in order to strengthen the company policy against chemical risk and to provide a more APEOs focused monitoring system. In 2015 testing started in January and ended in December with a total of 21 tests on a sample of 10 suppliers accounting for around 20% of Miroglio Textile yearly purchases. Best testing methods available at independent certified laboratories were used.

**Tabella 1 - Tested suppliers by Country**

Country	N. of tested suppliers
China	4
Turkey	2
South Korea	1
Indonesia	1
Italy	1
Taiwan	1

**Tabella 2 - Tested samples by fiber content**

Fiber1	Fiber2	fiber3	pass / fail
83% Viscose	14% Acrylic	3% Elastan	pass
83% Viscose	14% Acrylic	3% Elastan	pass
100% Viscose			pass
100% Viscose			pass
63%Polyester	34% Viscose	3% Elastan	pass
71% Polyester	27% Viscose	2% Elastan	pass
100% Viscose			fail
94% Polyester	6% Elastan		pass
96% Viscose	4% Elastan		pass
72% Polyester	23% Viscose	5% Elastan	fail
70% Viscose	25% Polyammide	5% Elastan	pass
100% Polyester			pass
100% Polyester			pass
100% Polyester			pass
100% Polyester			pass
100% Polyester			pass
100% Polyester			pass
100% Polyester			pass
100% Polyester			pass
100% Polyester			pass
100% Polyester			pass
94% Viscose	6% Elastan		pass

**4.1.2 Results**

Traces of NPEOs were found on 2 samples from Chinese suppliers, (8ppm in a pure viscose fabric, and 24mg/kg in a mixed fibers fabric).



The sample found to have 24 mg/kg of APEOs comes from a supplier that in the same day tested a further sample (with different fiber composition) that passed the test.

## **4.2 Global survey on suppliers**

In September 2015 Miroglio Textile completed a global survey to assess:

- ✓ the status of APEO awareness with our manufacturing partners and
- ✓ its usage within Miroglio Textile upstream supply chain.

### *4.2.1 Method*

A survey questionnaire was sent to all the relevant suppliers (60 questionnaires). 37 suppliers answered to the questionnaire (62%), most of them located in Asia, accounting for 64% of relevant Miroglio Textile purchases.

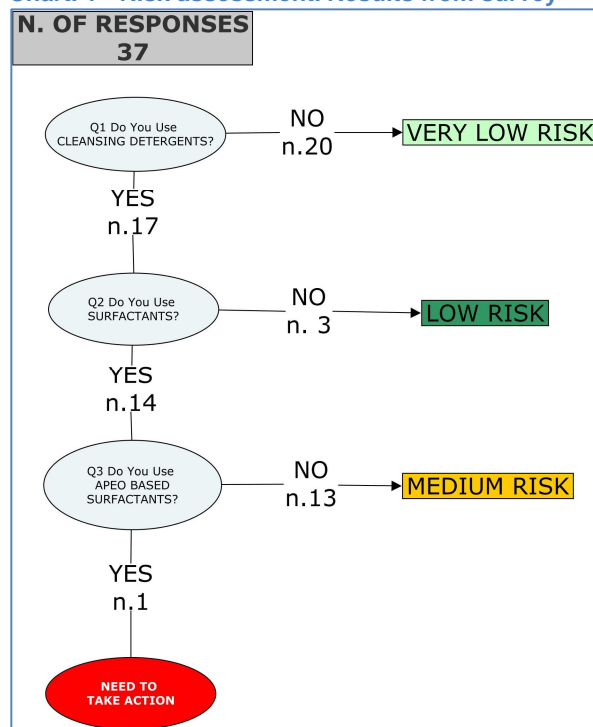
### *4.2.2 Results*

The answers helped in drafting a first suppliers' M-RSL non-compliance in APEO use risk assessment, including an assessment of the awareness and the monitoring capacity of the suppliers.

The use of surfactants was investigated with a funnel questioning approach: Q1. *Do You use Cleansing detergents?* Q2. *If yes, Do You use surfactants?* Q3. *If Yes Do You use APEO based surfactants?*

The survey found 14 suppliers to use surfactants (Chart. 1). Out of the 13 that were classified as MEDIUM RISK: need to monitor for either intentional or non intentional use of APEOs. One supplier was classified as NEED TO TAKE ACTION as it is making intentional use of APEOs.

Chart. 1 - Risk assessment. Results from survey



The awareness was tested with specific questions, starting from a very general awareness: Q9. *Do You know or have You heard about the presence of surfactants like Alkylphenol, Nonilphenol or Octylphenol Ethoxylates (APEOs) in cleansing detergents?*

The survey found 6 suppliers having no knowledge about APEOs, all of the 6 however are not using any detergent and 4 out of them declare to have no releases of post processes water.

A question about monitoring was also asked to the 26 suppliers that declare to have releases of post processes water.

Q10. *Do You check for the presence of Alkylphenol, Nonilphenol or Octylphenol Ethoxylates (APEOs) in Your discharge waters?*

The survey found only 9 of them to already check for APEOs while 16 do not and 1 did not answer.

All the suppliers but 3 (that do not use detergents and do not have water releases) were aware of the limitations the EU will implement in the coming years about the import of textile products where APEOs are detected.

The survey also tested the suppliers' openness full information disclosure about APEOs testing and/or to initiate further investigations. The results show a still limited openness by most suppliers and call for further future action from Miroglio textile side.

## **5 Summary of investigation results, conclusions & next steps**

A number of initiatives are already in progress or implemented to ensure no APEOs can enter Miroglio Textile products at different stages in the supply chain:

- According to the public Miroglio Textile M-RSL, that sets detection limits in line with best available technology, APEOs are banned since July 2014;
- Supply contracts are being reformulated to ensure full supply chain compliance with Miroglio Textile APEO elimination commitment;
- A focused testing program was implemented in July 2014, January and April 2015 on the water discharges in the two main Miroglio Textile facilities of Govone and Guarene.
- A questionnaire survey was delivered to relevant suppliers in September 2015, to investigate the use of APEOs in the supply chain

### Main findings

- No traces of APEOs were found on Miroglio facilities' water discharges in any testing campaigns (July 2014, January 2015, April 2015).
- The supplier survey as answered by 37 companies, most of them located in Asia
- the survey highlighted 13 medium risk suppliers that make no intentional use of APEOs but need monitoring as they use surfactants, and 1 supplier that makes intentional use of APEOs and requires action from Miroglio side.
- the survey found a widespread awareness about the APEOs issue
- the survey highlighted the need for strengthening suppliers monitoring about the entry of APEOs in the supply chain as just 9 out of 26 relevant suppliers implement APEOs focused testing on water discharges
- the survey found a limited openness of most suppliers to disclose full information about APEOs related water testing and/or to initiate further investigations

In the next future Miroglio Textile srl is taking action to:

- strengthen the monitoring on the 13 medium risk suppliers;
- enter a negotiation with the supplier intentionally using APEOs
- strengthen the pressure on suppliers about monitoring the entry of APEOs in their own processes through water discharge testing
- raise the openness of suppliers about APEOs related full information disclosure.

More in general, Miroglio Textile is working to achieve active involvement across the supply chain in order to:

- disseminate information about APEOs substitutes;
- identify chemical formulations containing APEO still in use;
- identify alternative formulations or substances that guarantee equivalent results in industrial processing;
- undertake systematic substitution to achieve total elimination across the supply chain.

**Miroglio Textile**, as part of the Italian DETOXLeader Group together with Canepa Spa, Italdenim Spa, Berbrand srl, Tessitura Attilio Imperiali Spa, Gaetano Lanfranchi Lampo, Zip Gfd Spa, is fully aware that only with the active participation of the entire fashion industry it is possible to deliver the desired outcomes on a global scale.