Prato textile district

The Detox Approach

and

why and how a group of textile supply chain SMEs got together to substitute SVHCs

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The production of Prato Textile District

Prato began to specialize in textiles in the 12th century

Prato is renowned for (carded woollens).

recent developments:

yarns for knitwear, synthetic leather, synthetic fur, furnishing fabrics, nonwoven fabrics, technical fabrics, special fabrics, and knitwear.

Prato is today the largest Italian district of textile and clothing

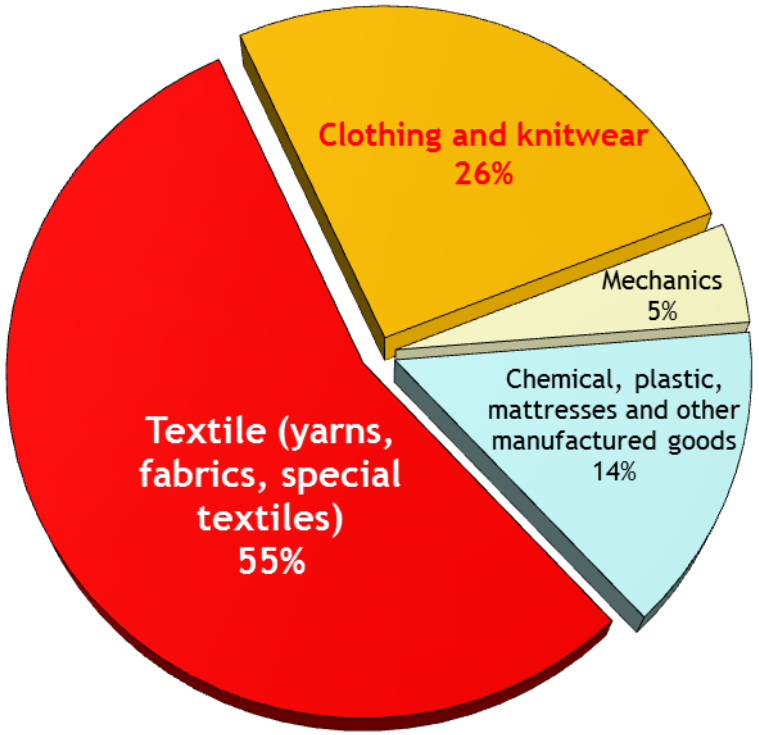
The textile and clothing industry in Prato is today:

- more than 30,000 direct employees,
- 7,500 businesses in network,
- 4,500 million Euro of turnover

Prato produces also excellent textile machines for finishing, spinning and special textile

Breakdown of exports of Prato in 2014

(% values)



The centralized waste water treatment plant

The waste water conveyed by the public sewer system of Prato to the treatment plants is purified and returned to the industrial cycle:

- 12 million m³ of water is the total needs of the textile production,
- 64 km of the tubes is the length of pipes that distribute recycled water,
- 5 million m³ is the amount of purified water reintroduced in textile processes:

the contribution of recycling is 40% of the total industrial water.

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The Greenpeace
DETOX campaign

WHY PRATO TEXTILE DISTRICT JOIN DETOX CAMPAIN ?

Prato for Detox

Fashion brand side

- Testing innovative sustainable textile processes
- Testing new chemicals
- Training for technicians
- Technical consulting

Greenpeace side

- Technical feasibility
- Development of sustainable production processes
- Training for volunteers
- Analytical investigations

Textile district of Prato

- Manufacturing textile industries
- Specific technical skills
- District EMAS Certification
- Water purification and recycling
- Background support for fashion

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February 2016:
CTN announced in early 2016 its subscription to Detox campaign

first textile district in the world that subscribe a collective detox commitments.

DETOX

http://www.greenpeace.org/detox/

July 2016

CID (Consorzio Italiano Implementazione Detox – Italian Consortium for implementing Detox approach).

- ✓ assure technical support for every member, even for obtain environmental and/or ethic issues
- ✓ promote R&D projects for implementing efficiency of production processes
- ✓ promote any sustainability activities of the companies.
- ✓ organize meeting between manufacturing companies, chemical producers, international organization involved in environmental safety, especially concerning textile and fashion market

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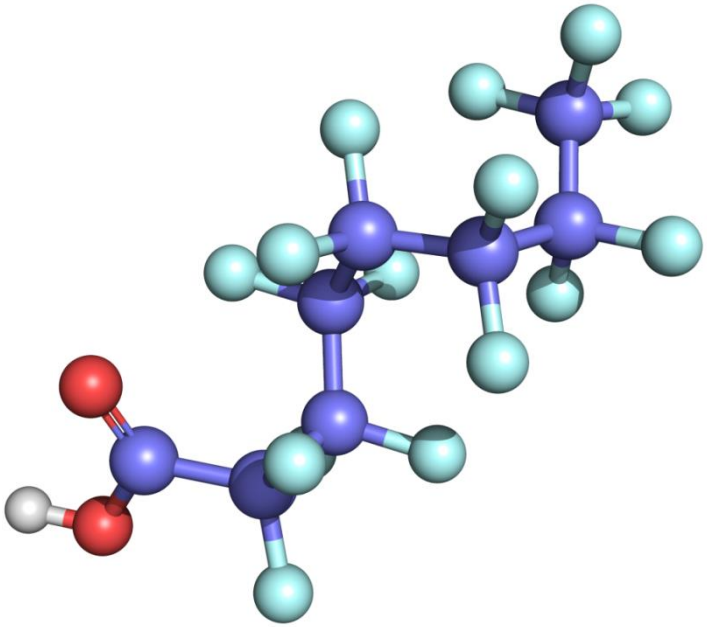
REPLACING HAZARDOUS CHEMICALS FROM PRODUCTS/PROCESS

AND

PLANNING SUBSTITUTION

SOME CASE STUDIES (promoted by CTN and CID)

Case study 1: chemical substitution of PFC



Companies of the textile district which follow the Detox commitment represent different parts of the textile supply chain: factories producing yarn, fabric and raw materials, dyeing plants, yarn or fabric finishing companies, producers of chemicals for the textile industry.

Within this group, only seven mills performed processing techniques in which PFCs can be involved. So, these companies worked together as integrated supply-chain to avoid and eliminate PFC from productions

PFC: WATER ANALYSIS AND MONITORING

on February 2016, CTN and GIDA (company who manage the wastewater treatment plant) **signed an agreement for a long-period monitoring analysis planning for recycled water for the 11 group of MRSL Detox of Prato District.**

	18/04/16		28/04/16		09/05/16		09/11/16	
	M1	M2	M1	M2	M1	M2	M1	M2
PFC	NR	NR	21 ng/L PFHpA 112 ng/L PFOA 21 ng/L PFNA 25 ng/L PFDA 3 ng/L PFUnA	6 ng/L PFHpA 27 ng/L PFOA 5 ng/L PFNA 5 ng/L PFDA 1 ng/L PFUnA	4 ng/L PFHpA 220 ng/L PFOA 54 ng/L PFNA 63 ng/L PFDA 5 ng/L PFUnA	110 ng/L PFHpA 64 ng/L PFOA 14 ng/L PFNA 16 ng/L PFDA 1,2 ng/L PFUnA	50 ng/L PFOA 15 ng/L PFNA	40 ng/L PFOA 12 ng/L PFNA

Analysis performed by BUZZI LAB

Chemical analysis of input and output water of Prato District Companies at the sign of Detox commitment

Read the full study: http://www.consorziodetox.it/index.php/documents/?lang=en

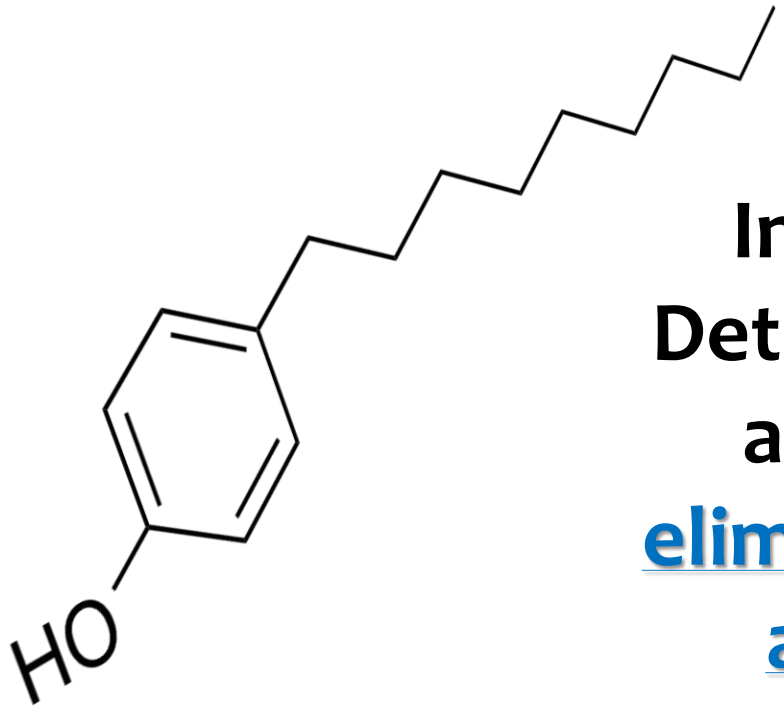
Chemical suppliers/vendor performed PFC analysis for their water-repellent products and water-repellent fabrics

Read the full study: http://www.consorziodetox.it/index.php/documents/?lang=en

PFC: PERFORMANCES EVALUATIONS

Results at link: http://www.daykem.it/wp-content/uploads/2012/11/Sostituzione-pfc-case-study-daykem.pdf

Case study 2: chemical substitution of APEOS



In the roadmap of Detox Campaign, mills are committed to eliminate Alkylphenols away from their supply-chain

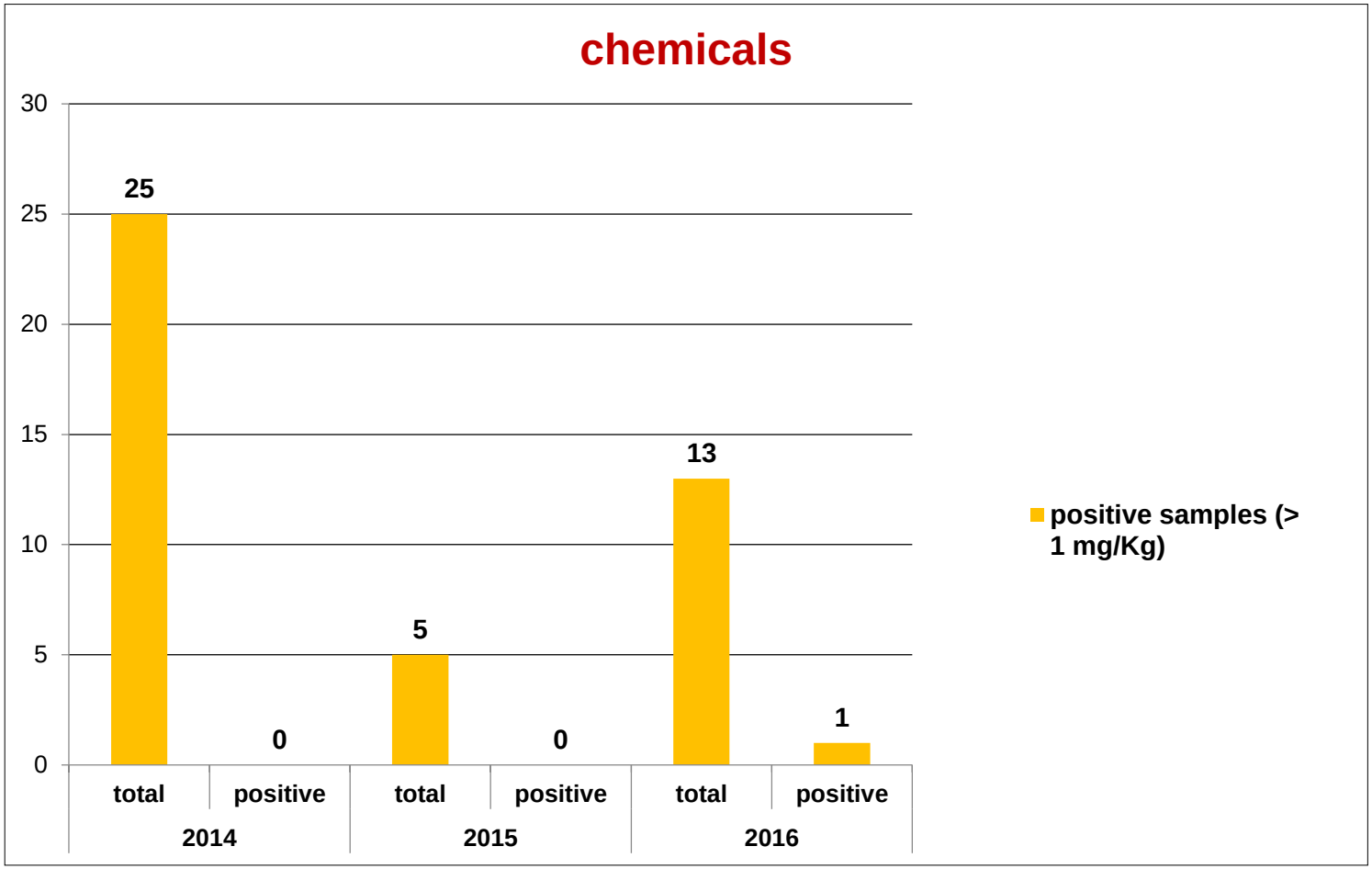
Detox committed companies in Prato District started an investigation plan in order to monitoring their supply chain and internal manufacturing processes.

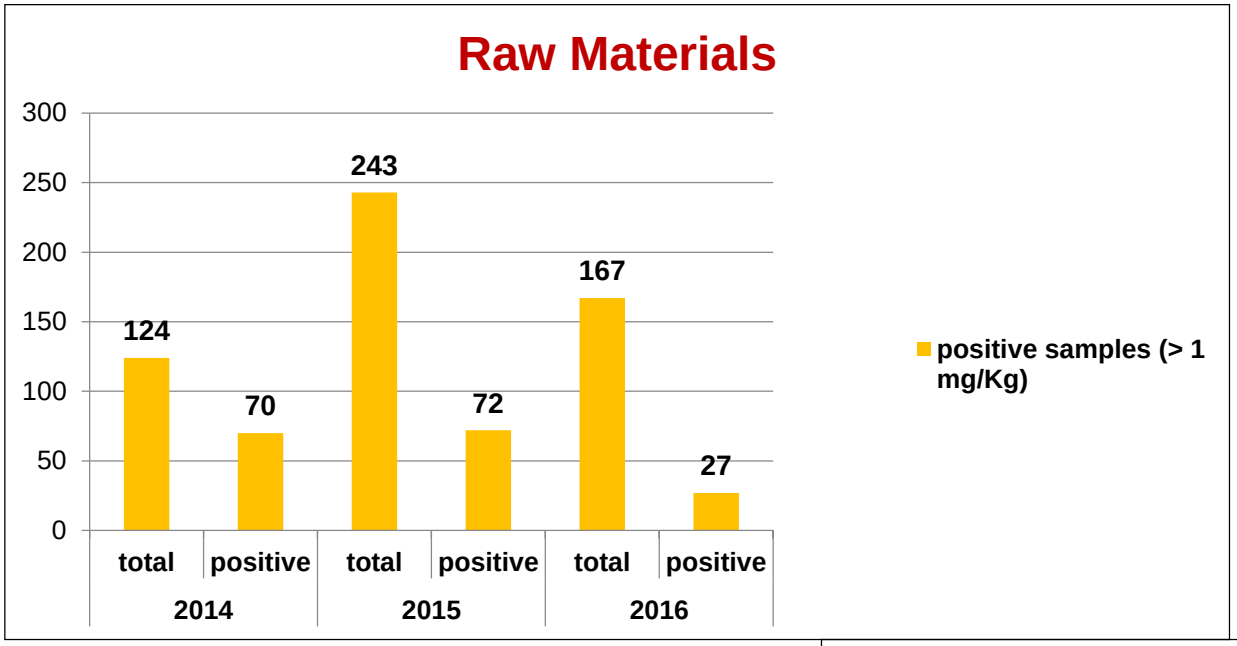
Analytical results of singles companies are available on own website

Full data on CTN web side:

https://www.confindustriatoscananord.it/media/DETOX/CTN_APEOS_CaseStudy_2016_DEF_ENG.pdf

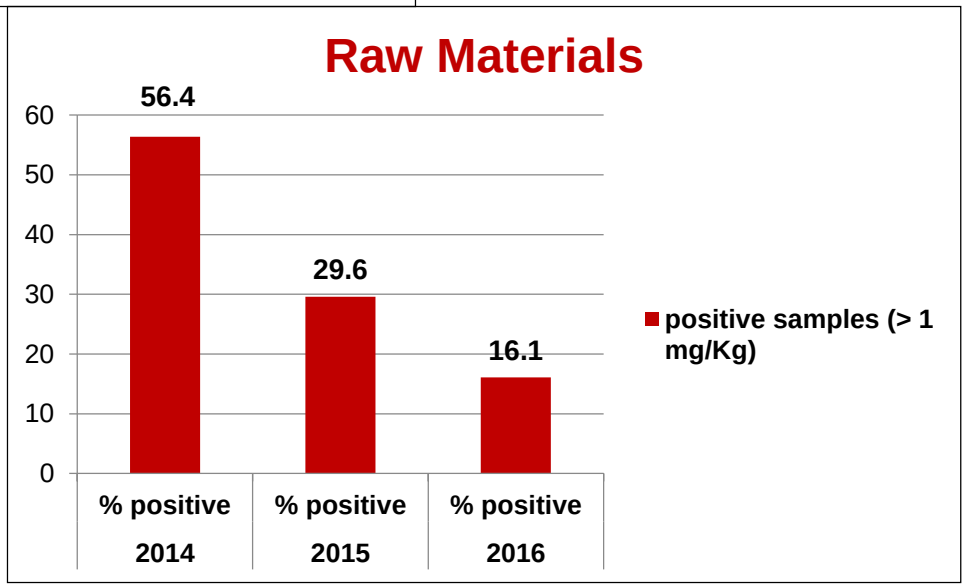
APEOS

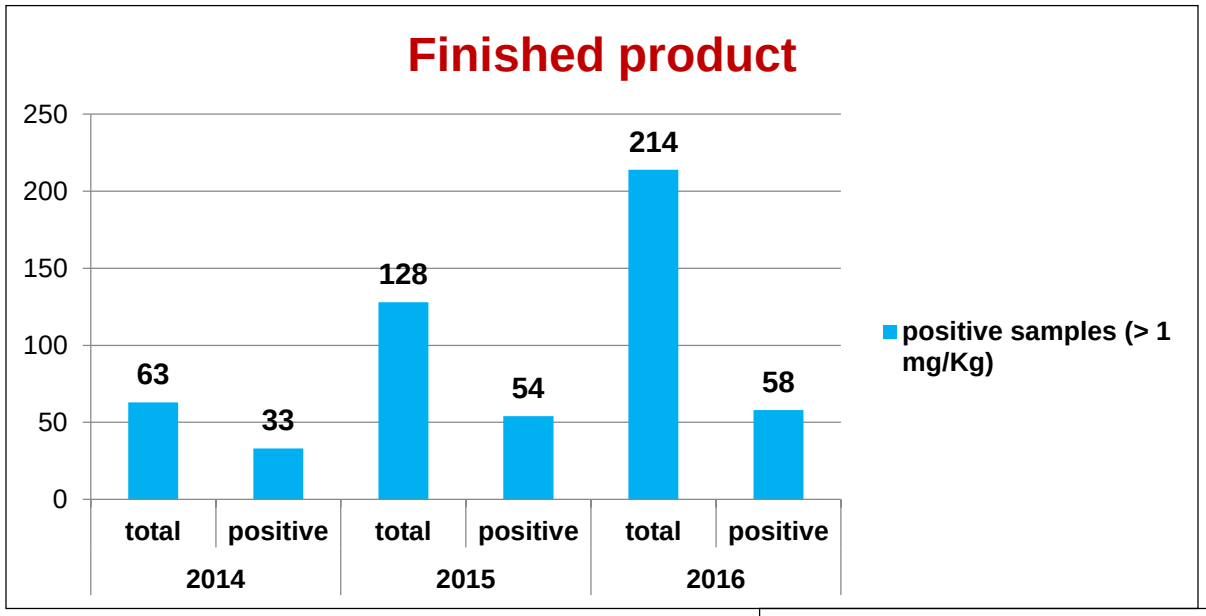




APEOS

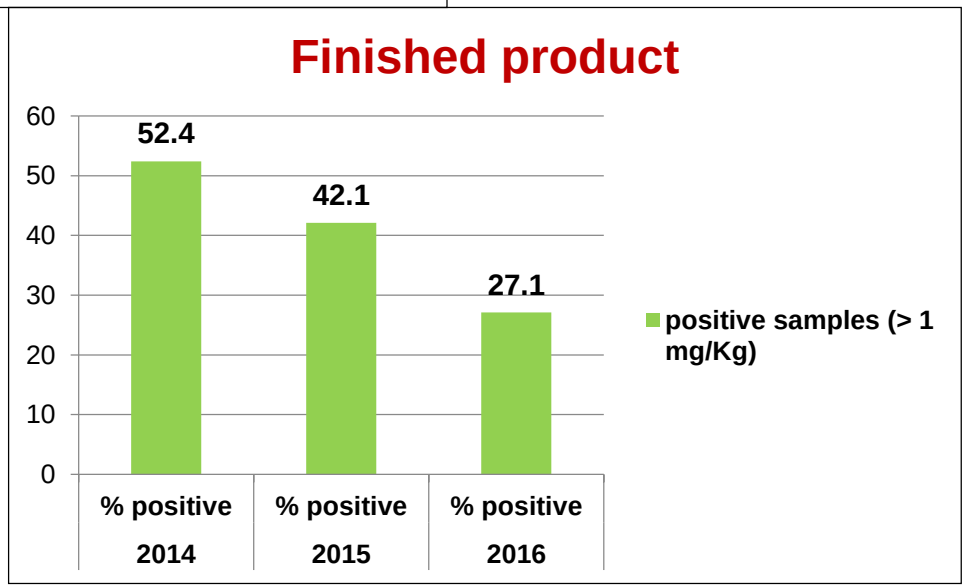
APEOS





APEOS

APEOS



Case study 3: chemical contamination of dyestuffs for fashion industry

TOPIC: case study for evaluation of chemical contaminations of more-frequently used dyestuffs in Prato Textile District and consequent substitution of high-contaminated ones

Chemical analysis was restricted only to four groups of substances
(respect to the 11 priority groups of Detox Commitment)

Parameter	MRSL DETOX Limit
Ethoxylated Alkylphenols – APEOS	1 mg/kg
Aromatic amines from azocolorants	1 mg/kg
Chlorophenols	0.05 mg/kg
Phthalates	10 mg/kg

Companies involved in this case study were the dyeing mills who signed Detox Commitment

Chemical analysis made by Buzzi Lab (Buzzi Laboratorio analisi)

AROMATIC AMINES DERIVED FROM AZOCOLORANTS

Test method compliant to **UNI EN ISO 14362-1:2012 Annex F.**
Brief description of test method: a weighted sample of dye is treated in citric buffer with sodium dithionite (reductive cleavage). The released amine/s is/are extracted in organic solvent and quantitatively analised by **GC-MSMS and LC-MSMS.**

Limit of Detection: 0,01 mg/kg
Limit of Quantification (MRSL): 1 mg/kg

APEOS / CHLOROPHENOLS / PHTHALATES

Test Method: **in-house method** (developed by Buzzi Lab) was used by high-resolution mass spectrometry/time-of-flight liquid chromatography **(LC-QTOF equipment).**
Brief description of test method: a weighted sample of dye is dissolved in organic solvent and directly analized by LC-QTOF.

Limit of Detection: APEOS and Chlorophenols: 0.01 mg/kg – Phthalates: 0.1 mg/kg
Limit of Quantification (MRSL): APEOS: 1 mg/kg – Chlorophenols: 0.05 mg/kg – Phthalates: 10mg/kg

SUMMARY: 228 dyestuffs analised

Group	LIMITS		TOTAL NON-COMPLIANCE	
	MRSL Detox Prato District	ZDHC v 1.1-2015 Group B	Respect to MRSL Detox	Respect to ZDHC
Aromatic Amines	1 ppm	150 ppm	35%	1%
APEOS	1 ppm	500 ppm	48%	0%
Chlorophenols	0.05 ppm	50ppm (20ppm PCP-TeCP)	12%	0%
Phthlates	10 ppm	250 ppm (sum)	2.5%	0%

Example of report

COLOR INDEX	Chlorophenols	Phthalates	Aromatic Amines	APEOS
DIRECT BLACK 112	/	/	/	NPEO 1.8
DIRECT BLACK 22	PCP 0.16	/	4-chloro aniline 12.8	NPEO 45.4
DIRECT BLACK 19	/	/	4-chloro aniline 29.2 4,4'-thiodianiline 17.5	NPEO 1.4
DIRECT BLACK 80	/	/	4-aminodiphenyl 3.8 2-naphthylamine 1.4 4-chloro aniline 35.8	/
DIRECT BLUE 199	/	/	/	NPEO 93.7
DIRECT BLUE 299	/	/	2-naphthylamine 11.5 4- chloro aniline 1.6	/
DIRECT BLUE 218	/	/	3,3'-dimethoxybenzidine 5.9 o-anisidine 1.3	NPEO 1.9

Full data are available on CID website:
http://www.consorziodetox.it/index.php/documents/?lang=en

Thank you for attention

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