《纺织服装数码转印烫画膜》
团体标准编制说明
（讨论稿）

1 项目概况

1.1 任务来源

广东省纺织团体标准《纺织服装数码转印烫画膜》由广东省纺织协会、广东省纺织工程学会和东莞市鸿泰达烫印有限公司联合提出。于2025年5月正式立项。

2 行业现状

2.1 行业发展概况

纺织服装数码转印烫画是一项中国首创的数字化生产工艺，简称 DTF(Direct to Film)，它是在传统热熔转移印花（柯式烫画）工艺的基础上，将平版印刷彩色图案、网版印刷底层白墨转为数码喷印彩墨和白墨，将网版印刷热熔胶转为自动撒涂热熔胶粉，在 PET 膜上数码喷印图案再转印到织物上的一种间接印花方法， 也称为“数码喷墨热熔转移印花”，俗称“烫画”。

2.1.1 主要特点

1.几乎适用于所有类型纤维织物。

2.无需对织物预处理和印花的后处理。

3.图案清晰、色彩鲜艳。

4.生产流程短、操作简易、速度快、成本低。

5.占地面积小、投资少。

6.符合纺织品安全技术标准要求。

7.适宜小单快反、个性化一件定制的市场需求等。

2.1.2 主要工艺过程

PET改性膜→涂布→喷印彩墨（镜像图案）→喷印白墨（底层） →撒涂热熔胶粉→抖掉余粉→烘干→热熔转移印花膜→T恤→转印（温度+时间+压力）→撕膜→成品。

PET改性膜是其中的一项重要原材料，目前没有标准。

3 主要工作过程

2025年2月15日，广东省纺织协会作为主办单位，举办了2025广东数码纺织印花技术及市场发展趋势交流会。

2025年2月20日，广东省纺织协会联合广东省纺织工程学会到东莞市鸿泰达烫印有限公司调研，参观了公司的生产车间、技术研发中心，并与企业负责人及技术人员进行了深入交流。

2025年2月28日，广东省纺织协会到东莞市鸿泰烫画材料有限公司，进行“广东省纺织行业数码烫画转印技术研究中心”授牌仪式。

2025年4月17日，广东省纺织协会联合广东省纺织工程学会到东莞市鸿泰达烫印有限公司讨论立项书，了解纺织服装数码转印烫画行业发展现状。

2025年5月19日，广东省纺织协会联合广东省纺织工程学会到广州琶洲保利世贸博览馆，进行“广东省纺织行业数码印花

解决方案技术研究中心”揭牌仪式。

2025 年 5 月，编制《纺织服装数码转印烫画膜》（框架稿）。

2025 年 6 月，广东省纺织协会、广东省纺织工程学会及东莞市鸿泰达烫印有限公司在线上进行交流，了解广东省纺织服装数码转印烫画行业发展情况及发展中遇到的问题等，并形成《纺织服装数码转印烫画膜》（初稿）。

2025 年 7 月，《纺织服装数码转印烫画膜》（初稿）经修改补充，形成《纺织服装数码转印烫画膜（征求意见稿）》。

2025 年 8 月公开征求意见。

4 制定标准的目的和意义

4.1 符合政策要求

“2011 年，国家发改委等多部门联合发布的《当前优先发展的高技术产业化重点领域指南》中，数码印花设备被列入数字化专用设备，成为国家重点鼓励发展的高新技术产品：2016 年，《中国制造 2025》提出要加快纺织、电子等行业生产设备的智能化改造，全面推进建材、轻工、印染等传统行业绿色改造，提高精准制造、敏捷制造能力，构建高效、清洁、低碳、循环的绿色制造体系；2019 年，“数字印刷”被列入国家发展改革委员会《产业结构调整指导目录》的鼓励类；2021 年，国家新闻出版总署出版业“十四五”时期发展规划提出，“从当前急迫需要和长远需求出发，集中优势资源突破喷墨数字印刷喷头、高端印刷装备器材等关键核心技术装备，实施关键核心技术攻关工程，

解决一批‘卡脖子’问题”。国家鼓励性政策的出台，为行业向好发展提供了直接明确的保障和指引。”

4.2 编制标准有利行业创新提升

组织编制《纺织服装数码转印烫画膜》团体标准，既填补纺织服装数码转印烫画膜行业标准的空白，又满足市场对标准化技术的需求，避免因标准缺失导致的产品质量参差不齐或市场混乱。数码转印技术发展迅速，团体标准可及时纳入最新技术成果，确保标准与行业创新同步。

4.3 有利于行业高质量发展

标准的制定可促进烫画印刷和纺织数码印花的数字化及绿色转型，推动纺织服装和箱包行业向高效、低耗发展，引领烫画膜生产绿色化、高效化。

5 标准编制原则

5.1 标准遵循规范性、合理性、目的性和可检验性原则。

5.2 坚持在生产实际中具有较强的实用性、指导性和可操作性。

在编制标准过程中，通过对烫画膜生产企业的调研，根据调研的情况，确定有关纺织服装数码转印烫画膜的团体标准内容。

5.3 标准编写格式依据

本标准根据 GB/T 1.1-2020《标准化工作导则 第 1 部分：标准化文件的结构和起草规则》进行编写。

6 主要质量指标的确定

编制小组调研、收集、试验和整理了相关数据形成了标准的主要质量指标。试验报告和工厂调研数据附后。根据生产和产品质量控制的需要，选择了载墨性能、粘粉性能、剥离性能、涂层稳定性能、机洗后效果等作为纺织服装数码转印烫画膜的内在质量指标，要求如下表所示。

项目	要求
载墨性能	墨量不低于 80%打印四色黑纯色图案，不流墨不挂墨。
粘粉性能	选用粒径不低于 80μm，纯度为 100%的 TPU 热熔胶粉，指定小字洗唛图案打印，图案以外的膜面不沾粉
剥离性能	在布重为 340 克每平方米的全棉帆布上进行压烫剥离测试，能分别实现秒撕、热撕、冷撕剥离后，花型图案色差不低于 3-4 级。
涂层稳定性能	轻刮蹭不掉涂层（粉末状物质）。
机洗后效果	5 洗 5 烘后花型图案不掉色、不开裂、不脱落。

选取了单位面积质量偏差率、幅宽偏差、疵点外观等指标作为纺织服装数码转印烫画膜的外观质量要求，具体要求如下表所示。

项目	要求
单位面积质量偏差率	±3

/%	
幅宽偏差/cm	±2
疵点	膜面无外观刮花现象、不能有破洞、无杂质、无异物、无明显色差等疵病，无漏涂、无松紧边和复卷不紧实现象。

7 标准主要内容

1　范围

本文件规定了纺织服装数码转印烫画膜的术语和定义、缩略语、产品分类和规格、要求、试验方法、检验规则、标志、包装、运输和贮存。

本文件适用于供纺织服装数码转移印花中使用的烫画膜的生产和质量管理。

3　术语和定义

定义了“数码转印、烫画膜、全时撕 、热撕、冷撕、秒撕”等。

4　缩略语

5　产品分类和规格

5.1　分类

5.2　规格

6　要求

6.1　安全性能要求

6.2　内在质量要求

6.3　外观质量要求

6.4　产品质量要求

7　试验方法

7.1 安全性能试验按 GB 18401 和 GB 31701 规定的试验方法执行。

7.2 内在质量

7.3 外观质量

8　检验规则

8.1 抽样方法

8.2 判定规则

8.3 验收

8.4 复验

9 标志、包装、运输和贮存

9.1 标志

9.2 包装

9.3 运输和贮存

附件 1：

测试报告

产品名称：白墨烫画打印膜

产品型号：全时撕 S9

产品批次：B24-05-16-073/5.18

报告日期：2024 年 05 月 19 日

测试标准：

■ 常规测试

□ 客户标准

一、测试条件

1，环境温度：27℃

2，环境湿度：48%RH

3，测试条件：I3200 四头机、M6502 抖粉机、A 款墨水、正常粉

二、测试效果

1，定墨性

上机打印正常（白墨墨量 100%），不聚墨不流墨。 走膜稳定流畅，打印步进没有错位。

2，粘粉率

抖粉干净，不沾粉。

3，离型

剥离轻松无翘边，打印膜无残留。

秒撕、热撕、冷撕均可。

4，洗水牢度

5 洗 5 烘（加洗衣液,40℃,1h）

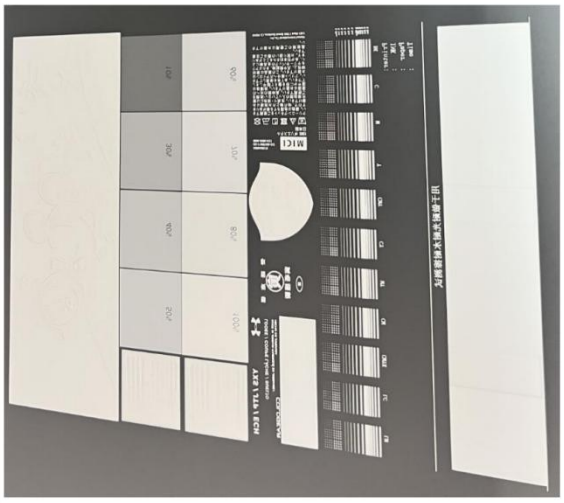
不掉色，不开裂，不脱落。

三、测试结论

序号	测试项目	标准要求	测试结果	判定结果
1	正常打印	走膜稳定、步进无错位	走膜稳定未发现步进错位现象	合格
2	定墨性	不聚墨、不流墨	打印过程中没有聚墨流墨现象	合格
3	粘粉率	抖粉干净、不粘粉	抖粉过程中未发现粘粉现象	合格
4	离型	轻松剥离不吃力、无翘边无残留	剥离轻松，快、热、冷撕均未发现翘边或残留现象	合格
5	洗水牢度	反复水洗不掉色，不开裂，不脱落	不掉色，不开裂，不脱落	合格

四、附件

1，墨量



2，剥离

3，洗水

附件 2：

测试报告

产品名称:	白墨烫画打印膜
产品型号:	全时撕 S9
产品批次:	B24-05-16-068/5.18
报告日期:	2024 年 06 月 07 日

测试标准:

□ 常规测试

■ 客户标准

一、测试条件

测试环境			
温度	26℃	**湿度**	48%
打印参数			
机型	瀚润 I3200 双头机		
白墨	QTRO-WHITE	**彩墨**	QTRO-CMYK
Rip 软件	蒙泰	**曲线**	#HRpaper Pro-A600
波形板卡	汉森板卡波形 4	**点类型**	大点
打印模式	6 pass	**羽化值**	50%
白墨墨量	100%	**彩墨墨量**	正常
温度控制			
打印机平台	常温		
抖粉机前置温度	70℃		
烤箱融粉温度	120℃		
压烫条件			
面料	340gsm 全棉帆布		
压烫机类型	气压	**压力**	5kg
温度	150℃	**时长**	7s

二、测试效果

1，定墨性

上机打印正常（白墨墨量 100%），不聚墨不流墨。 走膜稳定流畅，打印步进没有错位。

2，粘粉率

抖粉干净，不沾粉。

3，离型

剥离轻松无翘边，打印膜无残留。 秒撕、热撕、冷撕均可。

4，洗水牢度

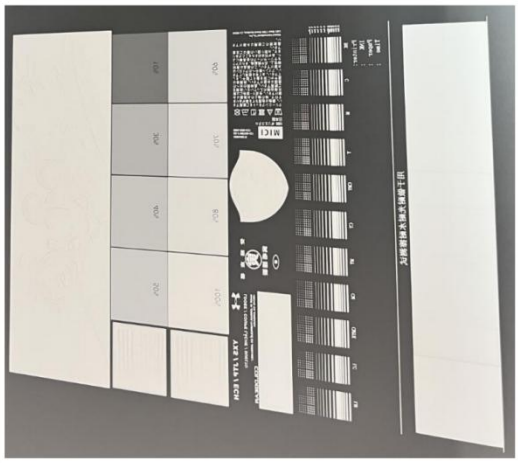
5 洗 5 烘（加洗衣液,40℃,1h） 不掉色，不开裂，不脱落。

三、测试结论

序号	测试项目	标准要求	测试结果	判定结果
1	正常打印	走膜稳定、步进无错位	走膜稳定未发现步进错位现象	合格
2	定墨性	不聚墨、不流墨	打印过程中没有聚墨流墨现象	合格
3	粘粉率	抖粉干净、不粘粉	抖粉过程中未发现粘粉现象	合格
4	离型	轻松剥离不吃力、无翘边无残留	剥离轻松，快、热、冷撕均未发现翘边或残留现象	合格
5	洗水牢度	反复水洗不掉色，不开裂，不脱落	不掉色，不开裂，不脱落	合格

四、附件

1，墨量



2，剥离

3，洗水


附件 3：

Dongguan Harmony Transfer Material Co., Ltd.
Room 101, Building 3, No. 5, Xusheng Road Liaobu To...
Dongguan City
Guangdong Province, 523408
China

Hohenstein Laboratories GmbH & Co. KG
Schlosssteige 1
74357 Bönnigheim
Germany

HOHENSTEIN

Report no. 25.0002754

from 12/02/2025

Order Date	21/01/2025
Period of Testing	21/01/2025 - 04/02/2025

Customer Reference

Certificate number 22.HCN.42960

Aim of Test	**OEKO-TEX® STANDARD 100 Annex 6 product class I Edition 03.2024**
Testing Material	**Heat transfer film with print**
Sampling	**The test object was sent to Hohenstein by the client.**

Your Contact Person	Duan Hanfei (hana@harmonyts.com.cn) +86 138 27261793
Our Contact Person	Zoe Yang (z.yang@hohenstein.cn) +86 21 23568271
Report Approval	This document has been created digitally and is valid without a signature. It has been approved by **Grace Gu** (Head of Certification Customer Service / 认证客服部经理)

Hohenstein Laboratories · Schloss Hohenstein ·

Summary

Passed ✓

Please refer to the test overview for details.

Testing Material

1 Heat transfer film with print	
Customer information	Colourless semi-transparent PET film with white heat transfer print
Characteristic	Transparent
Colour	Colourless, White
Finishing	Heat transfer printed
Material composition	PET

2 Heat transfer print on fabric	
Customer information	White heat transfer print on white fabric
Colour	White
Finishing	Heat transfer printed
Material composition	n.i.

Test Overview

Odour	
2 Heat transfer print on fabric	page 28 ✓

Terms of Use

The results relate only to the samples examined. The following decision rule applies to statements of conformity, unless required by law, standard or contractual agreement with the customer: ILAC G8:09/2019 4.2.1, w = 0 (simple acceptance rule). This report must only be reproduced in full and not in extract form. Use of the report in advertising or the publication of free interpretations of the results is only allowed with the express permission of Hohenstein. Only the authorized report is legally binding.

Our general terms and conditions of the respective laboratory location apply: www.hohenstein.com/en/gtcb

List of abbreviations

n.d. = not detectable

LOQ = Limit of quantitation

Appendix Table of Contents

Detail Results

pH-Value

The following results were evaluated against the limit values (LV):

I OEKO-TEX® STANDARD 100 Annex 6 product class I, 03.2024

	2	LV
pH-value	5.9	≥ 4.0 ≤ 7.5
Additional details for this test		

Parameter hints:
Testing method according to OEKO-TEX® STANDARD 100

Formaldehyde

The following results were evaluated against the limit values (LV):

I OEKO-TEX® STANDARD 100 Annex 6 product class I, 03.2024

	1 [mg/kg]	2 [mg/kg]	LOQ [mg/kg]	LV [mg/kg]
Formaldehyde	n.d.	n.d.	< 10	< 16
Additional details for this test				

Parameter hints:
Testing method according to OEKO-TEX® STANDARD 100

Result value details:
Formaldehyde
n.d. corresponds according to "Japanese Law 112" test method with an absorbance unit less than 0.05 resp. 16 mg/kg.

Extractable (heavy) metals

The following results were evaluated against the limit values (LV):

I OEKO-TEX® STANDARD 100 Annex 6 product class I, 03.2024

	1 [mg/kg]	LOQ [mg/kg]	LV [mg/kg]
Antimony	n.d.	< 4	< 30
Arsenic	n.d.	< 0.05	< 0.20
Lead	n.d.	< 0.05	< 0.20
Cadmium	n.d.	< 0.05	< 0.10
Chromium	n.d.	< 0.1	< 1.0
Cobalt	n.d.	< 0.1	< 1.0
Copper	n.d.	< 4	< 25
Nickel	n.d.	< 0.10	< 1.00
Mercury	n.d.	< 0.010	< 0.020
Barium	n.d.	< 4	< 1000
Selenium	n.d.	< 4	< 100
Zinc	n.d.	< 4	< 750
Manganese	n.d.	< 4	< 90

Additional details for this test

Parameter hints:
Testing method according to OEKO-TEX® STANDARD 100

Result value details:
Copper
No requirement for accessories and yarns made from inorganic materials, respecting the requirements regarding biological active products.

Heavy metals total content

The following results were evaluated against the limit values (LV):

I OEKO-TEX® STANDARD 100 Annex 6 product class I, 03.2024

	1 [mg/kg]	LOQ [mg/kg]	LV [mg/kg]
Arsenic	n.d.	< 5	< 100
Cadmium	n.d.	< 5	< 40
Mercury	n.d.	< 0.1	< 0.5
Lead	n.d.	< 5	< 75
Additional details for this test			

Parameter hints:
Testing method according to OEKO-TEX® STANDARD 100

Chlorinated phenols

The following results were evaluated against the limit values (LV):

I OEKO-TEX® STANDARD 100 Annex 6 product class I, 03.2024

	1 [mg/kg]	LOQ [mg/kg]	LV [mg/kg]
2-Chlorophenol	n.d.	< 0.01	-
3-Chlorophenol	n.d.	< 0.01	-
4-Chlorophenol	n.d.	< 0.01	-
Sum Monochlorophenols (MCP)	n.d.	-	< 0.50
2,3-Dichlorophenol	n.d.	< 0.01	-
2,4-/2,5-Dichlorophenol	n.d.	< 0.01	-
2,6-Dichlorophenol	n.d.	< 0.01	-
3,4-Dichlorophenol	n.d.	< 0.01	-
3,5-Dichlorophenol	n.d.	< 0.01	-
Sum Dichlorophenols (DCP)	n.d.	-	< 0.50
2,3,4-Trichlorophenol	n.d.	< 0.01	-
2,3,5-Trichlorophenol	n.d.	< 0.01	-
2,3,6-Trichlorophenol	n.d.	< 0.01	-
2,4,5-Trichlorophenol	n.d.	< 0.01	-
2,4,6-Trichlorophenol	n.d.	< 0.01	-
3,4,5-Trichlorophenol	n.d.	< 0.01	-
Sum Trichlorophenols (TrCP)	n.d.	-	< 0.20
2,3,5,6-Tetrachlorophenol	n.d.	< 0.01	-
2,3,4,6-Tetrachlorophenol	n.d.	< 0.01	-
2,3,4,5-Tetrachlorophenol	n.d.	< 0.01	-
Sum Tetrachlorophenols (TeCP)	n.d.	-	< 0.05
Pentachlorophenol (PCP)	n.d.	< 0.01	< 0.05
o-Phenylphenol (OPP)	n.d.	< 2.0	< 10.0
Additional details for this test			

Parameter hints:
Testing method according to OEKO-TEX® STANDARD 100

Phenol

The following results were evaluated against the limit values (LV):

I OEKO-TEX® STANDARD 100 Annex 6 product class I, 03.2024

	1 [mg/kg]	LOQ [mg/kg]	LV [mg/kg]
Phenol	n.d.	< 10.0	< 20.0
Additional details for this test			

Parameter hints:
Testing method according to OEKO-TEX® STANDARD 100

Organic tin compounds

The following results were evaluated against the limit values (LV):

I OEKO-TEX® STANDARD 100 Annex 6 product class I, 03.2024

	1 [mg/kg]	LOQ [mg/kg]	LV [mg/kg]
Monomethyltin (MMT)	n.d.	< 0.05	< 0.50
Monobutyltin (MBT)	n.d.	< 0.05	< 0.50
Monooctyltin (MOT)	n.d.	< 0.05	< 0.50
Monophenyltin (MPhT)	n.d.	< 0.05	< 0.50
Dimethyltin (DMT)	n.d.	< 0.05	< 0.50
Dipropyltin (DPT)	n.d.	< 0.05	< 0.50
Dibutyltin (DBT)	n.d.	< 0.05	< 0.50
Dioctyltin (DOT)	n.d.	< 0.05	< 0.50
Diphenyltin (DPhT)	n.d.	< 0.05	< 0.50
Trimethyltin (TMT)	n.d.	< 0.05	< 0.50
Tributyltin (TBT)	n.d.	< 0.05	< 0.50
Trioctyltin (TOT)	n.d.	< 0.05	< 0.50
Triphenyltin (TPhT)	n.d.	< 0.05	< 0.50
Tripropyltin (TPT)	n.d.	< 0.05	< 0.50
Tricyclohexyltin (TCyHT)	n.d.	< 0.05	< 0.50
Tetraethyltin (TeET)	n.d.	< 0.05	< 0.50
Tetrabutyltin (TeBT)	n.d.	< 0.05	< 0.50
Tetraoctyltin (TeOT)	n.d.	< 0.05	< 0.50
Additional details for this test			

Parameter hints:
Testing method according to OEKO-TEX® STANDARD 100

Chlorinated benzenes and toluenes

The following results were evaluated against the limit values (LV):

I OEKO-TEX® STANDARD 100 Annex 6 product class I, 03.2024

	1 [mg/kg]	LOQ [mg/kg]	LV [mg/kg]
Chlorobenzene	n.d.	< 0.10	-
1,2-Dichlorobenzene	n.d.	< 0.10	-
1,3-Dichlorobenzene	n.d.	< 0.10	-
1,4-Dichlorobenzene	n.d.	< 0.10	-
1,2,3-Trichlorobenzene	n.d.	< 0.10	-
1,2,4-Trichlorobenzene	n.d.	< 0.10	-
1,3,5-Trichlorobenzene	n.d.	< 0.10	-
1,2,3,4-Tetrachlorobenzene	n.d.	< 0.10	-
1,2,3,5-Tetrachlorobenzene	n.d.	< 0.10	-
1,2,4,5-Tetrachlorobenzene	n.d.	< 0.10	-
Pentachlorobenzene	n.d.	< 0.10	-
Hexachlorobenzene	n.d.	< 0.10	-
2-Chlorotoluene	n.d.	< 0.10	-
3-Chlorotoluene	n.d.	< 0.10	-
4-Chlorotoluene	n.d.	< 0.10	-
a-Chlorotoluene	n.d.	< 0.10	-
2,3-/3,4-Dichlorotoluene	n.d.	< 0.10	-
2,4-Dichlorotoluene	n.d.	< 0.10	-
2,5-/2,6-Dichlorotoluene	n.d.	< 0.10	-
3,5-Dichlorotoluene	n.d.	< 0.10	-
a,a-Dichlorotoluene	n.d.	< 0.10	-
2,3,4-Trichlorotoluene	n.d.	< 0.10	-
2,3,5-/2,4,5-Trichlorotoluene	n.d.	< 0.10	-
2,3,6-Trichlorotoluene	n.d.	< 0.10	-
2,4,6-Trichlorotoluene	n.d.	< 0.10	-
3,4,5-Trichlorotoluene	n.d.	< 0.10	-
a,a,a-Trichlorotoluene	n.d.	< 0.10	-
a,2,4-Trichlorotoluene	n.d.	< 0.10	-

	1 [mg/kg]	LOQ [mg/kg]	LV [mg/kg]
a,2,6-Trichlorotoluene	n.d.	< 0.10	-
a,3,4-Trichlorotoluene	n.d.	< 0.10	-
2,3,4,5-Tetrachlorotoluene	n.d.	< 0.10	-
2,3,4,6-Tetrachlorotoluene	n.d.	< 0.10	-
2,3,5,6-Tetrachlorotoluene	n.d.	< 0.10	-
a,a,a,2-Tetrachlorotoluene	n.d.	< 0.10	-
a,a,a,4-Tetrachlorotoluene	n.d.	< 0.10	-
a,a,2,6-Tetrachlorotoluene	n.d.	< 0.10	-
Pentachlorotoluene	n.d.	< 0.10	-
Sum	n.d.	-	< 1.00

Additional details for this test

Parameter hints:

Testing method according to OEKO-TEX® STANDARD 100

Result value details:

2,3-/3,4-Dichlorotoluene

2,3-Dichlorotoluene and 3,4-Dichlorotoluene are not analytically separable, so that the determined value for both substances must be given combined.

2,5-/2,6-Dichlorotoluene

2,5-Dichlorotoluene und 2,6-Dichlorotoluene are not analytically separable, so that the determined value for both substances must be given combined.

2,3,5-/2,4,5-Trichlorotoluene

2,3,5-Trichlorotoluene und 2,4,5-Trichlorotoluene are not analytically separable, so that the determined value for both substances must be given combined.

Polycyclic aromatic hydrocarbons

The following results were evaluated against the limit values (LV):

I OEKO-TEX® STANDARD 100 Annex 6 product class I, 03.2024

	1 [mg/kg]	LOQ [mg/kg]	LV [mg/kg]
Acenaphthene	n.d.	< 0.20	-
Acenaphthylene	n.d.	< 0.20	-
Anthracene	n.d.	< 0.20	-
Benzo[a]anthracene	n.d.	< 0.20	< 0.50
Benzo[b,k,j]fluoranthene	n.d.	< 0.20	< 0.50
Benzo[ghi]perylene	n.d.	< 0.20	-
Benzo[a]pyrene	n.d.	< 0.20	< 0.50
Benzo[e]pyrene	n.d.	< 0.20	< 0.50
Chrysene	n.d.	< 0.20	< 0.50
Cyclopenta[c,d]pyrene	n.d.	< 0.20	-
Dibenzo[a,h]anthracene	n.d.	< 0.20	< 0.50
Dibenzo[a,e]pyrene	n.d.	< 0.20	-
Dibenzo[a,h]pyrene	n.d.	< 0.20	-
Dibenzo[a,i]pyrene	n.d.	< 0.20	-
Dibenzo[a,l]pyrene	n.d.	< 0.20	-
Fluoranthene	n.d.	< 0.20	-
Fluorene	n.d.	< 0.20	-
Indeno[1,2,3-cd]pyrene	n.d.	< 0.20	-
1-Methylpyrene	n.d.	< 0.20	-
Naphthalene	n.d.	< 0.20	< 2.00
Phenanthrene	n.d.	< 0.20	-
Pyrene	n.d.	< 0.20	-
Sum 24 PAHs	n.d.	-	< 5.00
Additional details for this test			

Parameter hints:
Testing method according to OEKO-TEX® STANDARD 100

Result value details:
Benzo[b,k,j]fluoranthene
Benzo[b]fluoranthene, benzo[k]fluoranthene and benzo[j]fluoranthene have not been separated analytically and therefore the calculated value for these substances is given in combination.

Solvent residues

The following results were evaluated against the limit values (LV):

I OEKO-TEX® STANDARD 100 Annex 6 product class I, 03.2024

	1 [mg/kg]	LOQ [mg/kg]	LV [mg/kg]
1-Methyl-2-pyrrolidone (NMP)	n.d.	< 100	< 500
N,N-Dimethylacetamide (DMAc)	n.d.	< 100	< 500
N,N-Dimethylformamide (DMF)	n.d.	< 100	< 500
Formamide	n.d.	< 100	< 200
N-ethyl-2-pyrrolidone	n.d.	< 100	-
Additional details for this test			

Parameter hints:
Testing method according to OEKO-TEX® STANDARD 100

Result value details:
N-ethyl-2-pyrrolidone
Is under observation and the result is provided for information but presently not regulated

Chlorinated solvents, volatile organic compounds, glycols and cresols

The following results were evaluated against the limit values (LV):

I OEKO-TEX® STANDARD 100 Annex 6 product class I, 03.2024

	1 [mg/kg]	LOQ [mg/kg]	LV [mg/kg]
Dichloromethane	n.d.	< 0.1	< 1.0
Trichloromethane	n.d.	< 0.1	< 1.0
Tetrachloromethane	n.d.	< 0.1	< 1.0
1,1-Dichloroethane	n.d.	< 0.1	< 1.0
1,2-Dichloroethane	n.d.	< 0.1	< 1.0
1,1,1-Trichloroethane	n.d.	< 0.1	< 1.0
1,1,2-Trichloroethane	n.d.	< 0.1	< 1.0
1,1,1,2-Tetrachloroethane	n.d.	< 0.1	< 1.0
1,1,2,2-Tetrachloroethane	n.d.	< 0.1	< 1.0
Pentachloroethane	n.d.	< 0.1	< 1.0
1,1-Dichloroethylene	n.d.	< 0.1	< 1.0
cis-1,2-Dichloroethylene	n.d.	< 0.1	-
trans-1,2-Dichloroethylene	n.d.	< 0.1	-
Sum 1,2-Dichloroethylene	n.d.	-	< 1.0
Trichloroethylene	n.d.	< 0.1	< 1.0
Tetra(per)chloroethylene	n.d.	< 0.1	< 1.0
Sum of the 14 chlorinated solvents	n.d.	-	< 5.0
Methylethylketone	n.d.	< 1.0	< 10.0
Ethylbenzene	n.d.	< 1.0	< 10.0
m-/p-Xylene	n.d.	< 2.0	-
o-Xylene	n.d.	< 1.0	-
Sum Xylene	n.d.	-	< 10.0
Cyclohexanone	n.d.	< 1.0	< 10.0
1,2-Diethoxyethane	n.d.	< 1.0	< 10.0
1,4-Dioxane	n.d.	< 1.0	< 10.0
2-Ethoxyethylacetate	n.d.	< 1.0	< 10.0
1,2,3-Trichloropropane	n.d.	< 0.1	< 10.0
Acetophenone	n.d.	< 1.0	< 10.0

	1 [mg/kg]	LOQ [mg/kg]	LV [mg/kg]
2-Phenyl-2-propanole	n.d.	< 1.0	< 10.0
Bis(2-methoxyethyl) ether	n.d.	< 1.0	< 10.0
Styrene	n.d.	< 1.0	< 10.0
Benzene	n.d.	< 0.1	< 1.0
Toluene	n.d.	< 1.0	< 10.0
2-Ethoxyethanol	n.d.	< 1.0	< 10.0
Ethylene glycol dimethyl ether	n.d.	< 2.0	< 10.0
2-Methoxy-1-propanol	n.d.	< 1.0	< 10.0
Methylglycol	n.d.	< 2.0	< 10.0
2-Methoxyethylacetate	n.d.	< 1.0	< 10.0
2-Methoxypropylacetate	n.d.	< 1.0	< 10.0
Triethylene glycol dimethyl ether	n.d.	< 1.0	< 10.0
o-Cresol	n.d.	< 1.0	< 10.0
m-/p-Cresol	n.d.	< 2.0	< 10.0
Additional details for this test			

Parameter hints:
Testing method according to OEKO-TEX® STANDARD 100

Result value details:
m-/p-Cresol
m-Cresol and p-cresol have not been separated analytically, so that the determined value for these substances is given combined.

Chlorinated paraffins

The following results were evaluated against the limit values (LV):

I OEKO-TEX® STANDARD 100 Annex 6 product class I, 03.2024

	1 [mg/kg]	LOQ [mg/kg]	LV [mg/kg]
Short chain chlorinated paraffins C10-C13	n.d.	< 25	-
Medium chain chlorinated paraffins C14-C17	n.d.	< 25	-
Chlorinated paraffins	n.d.	-	< 50
Additional details for this test			

Parameter hints:
Testing method according to OEKO-TEX® STANDARD 100

Surfactant, wetting agent residues, alkyl phenols

The following results were evaluated against the limit values (LV):

I OEKO-TEX® STANDARD 100 Annex 6 product class I, 03.2024

	1 [mg/kg]	LOQ [mg/kg]	LV [mg/kg]
4-tert-Butylphenol (BP)	n.d.	< 4.0	-
Pentylphenol (PeP)	n.d.	< 4.0	-
Heptylphenol (HpP)	n.d.	< 4.0	-
Octylphenol (OP)	n.d.	< 4.0	-
Nonylphenol (NP)	n.d.	< 4.0	-
Sum BP, NP, OP, HpP, PeP	n.d.	-	< 5.0
Octylphenolethoxylates (OP(EO))	n.d.	< 4.0	-
Nonylphenolethoxylates (NP(EO))	n.d.	< 4.0	-
Sum BP, NP, OP, HpP, PeP, NP(EO), OP(EO)	n.d.	-	< 50.0
Additional details for this test			

Parameter hints:
Testing method according to OEKO-TEX® STANDARD 100

N-(hydroxymethyl)acrylamid

The following results were evaluated against the limit values (LV):

I OEKO-TEX® STANDARD 100 Annex 6 product class I, 03.2024

	1 [mg/kg]	LOQ [mg/kg]	LV [mg/kg]
N-(Hydroxymethyl)acrylamide	n.d.	< 100	< 1000
Additional details for this test			

Parameter hints:
Testing method according to OEKO-TEX® STANDARD 100

Bisphenols

The following results were evaluated against the limit values (LV):

I OEKO-TEX® STANDARD 100 Annex 6 product class I, 03.2024

	1 [mg/kg]	LOQ [mg/kg]	LV [mg/kg]
Bisphenol A	n.d.	< 5	< 100
Bisphenol B	n.d.	< 5	< 1000
Bisphenol S	n.d.	< 5	< 1000
Bisphenol F	n.d.	< 5	-
Bisphenol AF	n.d.	< 5	-
2,2'-Methylenebis(4-methyl-6-tert-butylphenol)	n.d.	< 5	< 1000
Bis(4-chlorophenyl)sulphone	n.d.	< 50	< 1000
Diphenyl(2,4,6-trimethylbenzoyl)phosphine oxide	n.d.	< 50	< 1000

Additional details for this test

Parameter hints:
Testing method according to OEKO-TEX® STANDARD 100

Result value details:

Bisphenol F
Bisphenol F is under observation and the result is provided for information but presently not regulated indeed.

Bisphenol AF
Bisphenol AF is under observation and the result is provided for information but presently not regulated indeed.

Phthalates

The following results were evaluated against the limit values (LV):

I OEKO-TEX® STANDARD 100 Annex 6 product class I, 03.2024

	1 [mg/kg]	LOQ [mg/kg]	LV [mg/kg]
Benzyl butyl phthalate (BBP)	n.d.	< 50	≤ 100
Dibutyl phthalate (DBP)	n.d.	< 50	≤ 100
Diethyl phthalate (DEP)	n.d.	< 50	≤ 100
Dimethyl phthalate (DMP)	n.d.	< 50	≤ 100
Di-(2-ethylhexyl)phthalate (DEHP)	n.d.	< 50	≤ 100
Di-(2-methoxyethyl)phthalate (DMEP)	n.d.	< 50	≤ 100
Di-C6-8 branched alkylphthalates, C7 rich (DIHP)	n.d.	< 50	≤ 100
Di-cyclohexyl phthalate (DCHP)	n.d.	< 50	≤ 100
Dihexylphthalate, branched and linear (DHxP)	n.d.	-	≤ 100
Di-iso-butyl phthalate (DIBP)	n.d.	< 50	≤ 100
Di-iso-hexyl phthalate (DIHxP)	n.d.	< 50	≤ 100
Di-iso-octyl phthalate (DIOP)	n.d.	< 50	≤ 100
Di-iso-nonyl phthalate (DINP)	n.d.	< 50	≤ 100
Di-iso-decyl phthalate (DIDP)	n.d.	< 50	≤ 100
Di-n-propyl phthalate (DPrP)	n.d.	< 50	≤ 100
Di-n-hexyl phthalate (DHP)	n.d.	< 50	≤ 100
Di-n-octyl phthalate (DNOP)	n.d.	< 50	≤ 100
Di-n-nonyl phthalate (DNP)	n.d.	< 50	≤ 100
Di-phentylphthalate (n-, iso-, or mixed) (DPP)	n.d.	-	≤ 100
Di-n-pentyl phthalate	n.d.	< 50	-
Di-iso-pentyl phthalate	n.d.	< 50	-
n-Pentyl-iso-pentyl phthalate (nPIP)	n.d.	< 50	-
Sum phthalates	n.d.	-	≤ 250
Di-n-undecyl phthalate (DUP)	n.d.	< 50	-
2,4,6-Tri-tert-butylphenol	n.d.	< 100	-
Additional details for this test			

Parameter hints:

Testing method according to OEKO-TEX® STANDARD 100

Di-C7-11-branched and linear alkylphthalates (DHNUP) are determined by sum of corresponding phthalates.

1,2-Benzenedicarboxylic acid, di-C6-10 alkyl esters are determined by sum of corresponding phthalates.

1,2-Benzenedicarboxylic acid, mixed decyl and hexyl and octyl diesters are determined by sum of corresponding phthalates.

Result value details:

2,4,6-Tri-tert-butylphenol

Is under observation and the result is provided for information but presently not regulated.

Siloxanes

The following results were evaluated against the limit values (LV):

I OEKO-TEX® STANDARD 100 Annex 6 product class I, 03.2024

	1	LOQ	LV
Octamethylcyclotetrasiloxane (D4) [mg/kg]	n.d.	< 100	< 1000
Decamethylcyclopentasiloxane (D5) [mg/kg]	n.d.	< 100	< 1000
Dodecamethylcyclohexasiloxane (D6) [mg/kg]	n.d.	< 100	< 1000
Tris(2-methoxyethoxy)vinylsilane	n.d.	< 100	< 1000
Additional details for this test			

Parameter hints:
Testing method according to OEKO-TEX® STANDARD 100

UV-stabilisers

The following results were evaluated against the limit values (LV):

I OEKO-TEX® STANDARD 100 Annex 6 product class I, 03.2024

	1 [mg/kg]	LOQ [mg/kg]	LV [mg/kg]
UV 320	n.d.	< 100	< 1000
UV 326	n.d.	< 100	< 1000
UV 327	n.d.	< 100	< 1000
UV 328	n.d.	< 100	< 1000
UV 329	n.d.	< 100	< 1000
UV 350	n.d.	< 100	< 1000
Drometrizole	n.d.	< 100	-

Additional details for this test

Parameter hints:
Testing method according to OEKO-TEX® STANDARD 100

Result value details:
Drometrizole

Odour

The following results were evaluated against the limit values (LV):

I OEKO-TEX® STANDARD 100 Annex 6 product class I, 03.2024

	1	LV
The following odour was noticed	No abnormal odour	(LV1)
Footnotes		
Leads to failed	**(LV1)** Abnormal odour	

Odour (Cont.)

	2	LV
The following odour was noticed	No abnormal odour	(LV1)
Footnotes		
Leads to failed	**(LV1)** Abnormal odour	
Additional details for this test		

Parameter hints:
Testing method according to OEKO-TEX® STANDARD 100