

Textile standards



your preferred partner



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JK GROUP IS A DOVER COMPANY

ABOUT JK GROUP

JK Group is a leader in the production of innovative inks for digital textile printing focusing on water based pigment and sublimation. JK Group provides the worldwide digital textile printing market through 3 independent brands. For more info visit: www.j-k-group.com

ABOUT DOVER CORPORATION

Dover is a diversified global manufacturer with annual revenues of approximately \$7 billion. Dover delivers innovative equipment and components, specialty systems and support services through four major operating segments: Energy, Engineered Systems, Fluids, and Refrigeration & Food Equipment. Dover combines global scale with operational agility to lead the markets we serve. Recognized for our entrepreneurial approach for over 60 years, our team of over 26,000 employees takes an ownership mindset, collaborating with customers *to redefine what's possible*. Headquartered in Downers Grove, Illinois, Dover trades on the New York Stock Exchange under "DOV." For more info visit: www.dovercorporation.com

ABOUT KIIAN DIGITAL: A JK GROUP BRAND

Kiiian Digital is a JK Group brand.

Headquartered in Novedrate, Italy, Kiiian Digital product portfolio includes sublimation, disperse and pigmented inks designed for the textile printing market. Kiiian Digital is the preferred partner for those seeking consistent quality and reliability in transfer and direct printing. With its roots in industrial specialty printing products, Kiiian Digital has a long experience in the development of customized products for different print heads and customer applications. For more info visit: www.kiiandigital.com



REGULATIONS, DIRECTIVES, NORMS AND VOLUNTARY TRADEMARKS

It is important to know the meanings and the differences between them, to manage daily work requirements.

REGULATIONS AND DIRECTIVES ARE COMPULSORY DEEDS.

Governments, public bodies or private bodies officially authorized to regulate particular matters and operation issue Regulations and Directives. Regulations and Directives are in force worldwide and everybody involved in the chain must be respected them.

THE NORMS ARE CONSENSUAL.

The norms are sets of rules and principles, which define the technical characteristics, performance, environmental and safety standards for products, processes and services. The officially accredited bodies approve the norms

VOLUNTARY TRADEMARKS ARE INDEPENDENT PRIVATE STANDARDS

These standards introduced by the leading brands of the specific market segments.

Voluntary trademarks work alongside directives, regulations and norms to guarantee both the users safety as well as the brand values. Independent bodies certify them.

**EVERYONE INVOLVED IN THE SUPPLY CHAIN
HAS TO RESPECT BOTH: VOLUNTARY TRADEMARKS AND
COMPULSORY LEGISLATION**



WHY CERTIFY PRODUCTS?

Certification is a form of "warranty" aimed to guarantee the compliance of end products with the requirements of the textile industry. Professionals in the textile world – producers, importers or printers – are obliged to limit or eliminate hazardous chemicals from their articles to comply with the worldwide standards, norms and regulations. The whole supply chain has to be monitored to implement the quality measures needed to comply with the legislative requirements as well as to protect the users.

WHO DOES THE CERTIFIER CONTROL?

Textile standards relate mostly the end-products (articles).

Kiiian Digital supports its customers by certifying that its ink ranges comply with certain textile standards. These standards specify limits for certain chemicals, compounds, colours and auxiliaries commonly used in the inks formulations.

KIIAN DIGITAL'S CHOICE

In addition to complying with the European directive, R.E.A.C.H– Kiiian Digital certifies that its inks also comply with 4 key global textile standards:

- > ADIDAS A01 (The ADIDAS Group standard)
- > NIKE RSL (Restricted Substances List)
- > CLEAR TO WEAR (INDITEX Group standard)
- > OEKOTEX STANDARD 100. (OEKOTEX Association standard – Independent standard)



CERTIFICATIONS & CHEMICAL SUBSTANCES

Qualified Laboratories carry out chemical analysis to investigate the presence of substances deemed, in certain quantities, to be both harmful for the environment and the human beings. Particular attention must be paid to dyes and chemical auxiliaries. These have to be free from dangerous substances such as formaldehyde, pesticides and toxic heavy metals.

Hazardous substances can be classified as follows:

Azo-dyes and Allergenic-dyes

Azodyes are synthetic dyes containing an azo-functional group -N=N-. They are regularly used dyeing textiles and leather. Some Azo dyes – under certain conditions – can produce carcinogenic aromatic amines. The European Union restricts 22 carcinogenic aromatic amines; see *R.E.A.C.H. (CE) n. 1907/2006 Annex XVII regulation*. There are some dyes, used in the Textile Industry, classified as harmful for the human beings. More than 20 disperse-dyes are classified Allergenic-dyes while 9 disperse-dyes are considered carcinogenic. These disperse-dyes can be absorbed on a prolonged contact with the skin.

Formaldehyde

Formaldehyde is a volatile organic compound used in Textile industry to prevent shrinkage and to promote anticrease attributes. It also improves mechanical resistances. Formaldehyde is irritating by inhalation and may cause significant damage to pulmonary function. It is classified as a probable human carcinogen. From 1st January 2016 Formaldehyde a formaldeide ha cambiato la sua classificazione da: carcinogeno di categoria 2"– Sospettato di provocare il cancro - a "Carcinogeno di categoria 1B" può provocare il cancro.

Pentachlorophenol (PCP), Tetrachlorophenol (TeCP) & Trichlorophenol (TriCP)

Textile and leather production (as well as in the wood one) use Chlorinated phenols – like PCP – thanks to their antibacterial and anti-fungus properties. PCP is toxic and considered a human carcinogen and toxic for the aquatic organism.



Pesticides and Herbicides

Their presence is found in natural fibres like cotton and wool.

Pesticides are used by farmers growing and to eliminate moths during the cotton storage. Pesticides are also regularly used in the on sheep. Herbicides are chemicals to control undesirable vegetation. For this reason, plants can absorb them even if they can be easily removed by careful washing. Pesticides and Herbicides range from slightly too very toxic and are easily absorbed on contact with skin.

Heavy metals

Heavy metals are present in some dyes and pigments. They can be found in natural fibers, because of their absorption from the earth, as well as in fabrics due to the textile finishing. Heavy Metals tend to accumulate in the internal body parts (liver and kidneys) causing severe health effects. Lead exposure – for example – may cause negative effects on the nervous system. The list of Heavy metals includes Antimony (Sb) – Arsenic (As) – Lead (Pb) – Cadmium (Cd) - Mercury (Hg) – Copper (Cu) – Chromium (Cr) – Chromium total VI (Cr) – Cobalt (Co) – Nickel (Ni).

- Cadmium and Lead are both classified as s carcinogenic. The EU has limited the use of Cadmium for a long time and has banned it since 2012. Consumer Product Safety Improvement Act (CPSIA) has limited the use of lead in the USA. The same decision has been taken by the EU
- Hexavalent chromium is a byproduct of the chemicals used in tanning leather. It has been classified as highly toxic and is a human carcinogen.
- Nickel is present in the metal-alloy accessories used for clothing: buttons, zips and metallic rivets. It may cause some people to develop – allergic reactions in case of long-term skin contact. The level of nickel emission has been limited according to REACH (CE) n. 1907/2006, Annex XVII regulation.

Phthalates

Phthalates are plasticizers used in the production of polyvinyl chloride (PVC). They are also used in the production of printing inks. It has been demonstrated that this type of PVC easily releases phthalates causing potentially dangerous effects in children. Many countries have legislated, the use of phthalates in toys and other products where children are in direct contact with them: Consumer Product Safety Improvement Act (CPSIA) in US and R.E.A.C.H. in EU.



TBT, DBT and other organotin compounds

TBT is used in the Textile Industry to prevent sweat induced bacterial degradation and inhibiting the resulting bad smell in socks and footwear. Other organotin compounds are used in PVC and PU production. Some organotin compounds are considered toxic in high concentrations due to their potential absorption through skin. These compounds may cause reproductive disorders and they are classified: toxic.

Chlorinated Carriers

Chlorinated Carriers are auxiliaries used in the dyeing of Polyester. They can cause harmful effects on the central nervous system as well as kidney and liver dysfunctions.

Flame retardant

TRIS, TEPA, 2, 3-dibromopropyl phosphate (TBPP), polybrominated biphenyls (PBB) and diphenyl ether (PBDE) are the most common flame-retardants. They may damage the immune system in case of long-term exposure as well as in high concentrations. They may also cause hypothyroidism, memory loss and joint stiffness.

pH value

pH (the index of acidity, basicity and neutrality) determines the compatibility of a fabric with skin to avoid allergic or inflammatory reactions. Human skin is slightly acid, inhibiting many diseases. Textile fabrics with a neutral or slightly acid pH (pH 7 and lower) are specified to avoid allergic or inflammatory reaction.

Dimethyl Fumarate (DMF)

The dimethyl fumarate is a volatile compound harmful for skin, eyes, mucous membranes and upper respiratory tract, by inhalation, contact or swallowing. It was used as a biocide to prevent growth of mould during storage transport and to prevent the deterioration of furniture, shoes and accessories. The European Union has banned its use according to the Community Resolution CE 2009/251/EC.



Alkylphenols (AP) and Alkylphenol-polyethoxylate (APEO)

Alkylphenols and Alkylphenol-polyethoxylate are commonly used in textile manufacturing as a wetting agent. The production and use of Nonylphenol (NP) and nonylphenol ethoxylates (NPEO) are limited from the European Union (REACH (CE) n. 1907/2006). NPEO have been used for many years as detergents, emulsifiers, and wetting and dispersion agents.

The NP is the intermediate molecule used in the chemical synthesis of NPEO. NPEO and NP are toxic for aquatic environments; they may cause negative effects on the natural balance of hormones of the aquatic animals as well as estrogenic effects.

Perfluorooctane Sulfonate (PFOS)

PFOS is largely used to give an oil and water repellent finish to finished and semi-finished products: clothing, carpets, textiles, leather and paper. PFOS is very toxic and bio accumulative.

Volatile Organic Compounds (VOC)

VOC are volatile Organic Compounds used in many industrial manufacturing processes: Paints and Coatings, Inks, Glues, cleaning products and footwear Industry. VOC are characterized by an intense smell due to their organic chemical nature. Benzene is one of the most known VOC, and it is carcinogenic. Some others VOC are classified as very toxic and irritant.



ADIDAS A01 (ADIDAS Group standard)

Adidas Group is a corporation that designs and manufactures sports goods for both professionals and amateurs. The group employs more than 50,000 people in over 160 countries. Adidas Group owns the following Brands:

- > ADIDAS
- > TAYLORMADE – ADIDAS GOLF
- > REEBOK
- > ROCKPORT

WHAT IS ADIDAS A01?

The **ADIDAS A01** standard defines in a clear way the guidelines to manage and control technical requirements, flow of information and certification tests for compliance of hazardous substances for all the materials supplied to the **ADIDAS GROUP** brands.

WHO HAS DEFINED THE STANDARD?

Marcus Kuerner, Product Safety Manager HQ/EMEA defined them.

WHAT DOES THE STANDARD CONCERN?

The standard is applied to all the materials branded Adidas or to any other brands owned by Adidas group. Some exceptions and exclusions are indicated in specific manuals.

WHAT IS THE STANDARD AIM?

The standard sets out to give technical specifications for the production of consumer goods respecting the health and safety of consumers, workers and environment as well as workplace Standards.

WHERE IS THE STANDARD APPLICABLE?

- > Sports shoes branded Adidas or any other Adidas Group brands
- > Accessories and sports equipment branded Adidas or any other Adidas Group brands
- > Sportswear branded Adidas or any other Adidas Group brands



WHAT DOES KIIAN DIGITAL CERTIFY?

Kiian Digital annually or whenever needed certifies its product ranges for the following classes of chemical risk:

- > Polychlorophenols (Pentachlorophenol (PCP), Tetrachlorophenol (TeCP) & Trichlorophenol (TriCP) and Ortho-Phenylphenol (OPP))
- > Heavy metals (Cadmium, Chrome, Lead and Mercury)
- > Organotin compounds
- > Polycyclic aromatic hydrocarbons
- > Formaldehyde

WHO DOES THE ANALYSIS ON BEHALF OF KIIAN DIGITAL?

All the tests related to **ADIDAS A01** standard are carried out **INTERTEK**, the official Lab approved by Adidas Group. INTERTEK is present worldwide thanks to a wide network of subsidiaries and labs.

USEFUL LINKS

To know more about the lab, visit www.intertek.com

To know more about ADIDAS A01 standard, visit www.adidasgroup.com



NIKE RESTRICTED SUBSTANCES LIST (NIKE Group standard)

NIKE, Inc. is the largest seller of athletic footwear and apparel in the world.

The group employs more than 33,000 people globally; producing over than 900.000 items per year selling products in more than 180 countries around the globe Nike Inc. owns the following Brands:

- > NIKE
- > CONVERSE
- > HURLEY
- > NIKEGOLF

THE RSL STANDARD

RSL STANDARD defines Nike commitment to protect customers, workers and environment through a well-structured sustainable program, which includes the RESTRICTED SUBSTANCES LIST (RSL) & SUSTAINABLE CHEMISTRY GUIDANCE. The strictest global legislations are the basis of the RSL list.

WHO HAS DEFINED THE STANDARD?

Nike board-level cooperate responsibility committee has given mandate to implement the strategic decisions to the Sustainable Business & Innovation (SB&I) Team.

WHAT DOES THE STANDARD CONCERN?

The standard concerns all the materials branded Nike, Converse, Nike Golf and Hurley.

WHAT IS THE STANDARD AIM?

All materials manufactured for Nike and Nike its brand: apparel, accessories shoes and equipment must comply with the strictest global legislation as well as the substances Nike has voluntarily restricted or phased-out are really restricted or phased-out in the life-cycle productions.

WHERE IS THE STANDARD APPLICABLE?

- > Shoes of any brand of Nike Inc.
- > Accessories and equipment of any brand of any brand of Nike Inc.
- > All the sportswear branded Nike, Converse, Nike Golf and Hurley.



WHAT DOES KIIAN DIGITAL CERTIFY?

Kiian Digital yearly certifies its range referring to the following chemical classes of risks:

- > Alkyl phenol Ethoxylates (NPEO, OPEO).
- > Azo Dyes (all those included in the RSL list)
- > Phthalates
- > Polyvinylchloride (PVC)
- > Volatile Organics (VOCs)
- > Disperse Dyes (all those included in the RSL list)
- > Metals
- > Organotin Compounds

WHO DOES THE ANALYSIS ON BEALFH OF KIIAN DIGITAL?

Tests shall be carry on by Nike, Inc., approved laboratory: BUREAU VERITAS.

BUREAU VERITAS operates around the world with 1,400 offices and laboratories, in 140 countries.

USEFUL LINKS

To know more about the BUREAU VERITAS lab, visit <http://www.bureauveritas.co.uk/>

To know more about Nike standards, visit <http://www.nikeincchemistry.com/>

CLEAR TO WEAR (INDITEX Group Standards)

Inditex Group (Industrias de Diseño Textil Sociedad Anónima) is one of the largest fashion retail groups in the world, headquartered in Galicia (Spain). Amancio Ortega founded the company; the group owns more than 100 companies and the following brands:

- | | | |
|-----------------|----------------|-------------|
| > ZARA | > BERSHKA | > ZARA KIDS |
| > MASSIMO DUTTI | > OYSHO | > ZARA HOME |
| > PULL AND BEAR | > STRADIVARIUS | |

WHAT DO INDITEX STANDARDS DO?

Inditex has developed two in-house standards concerning products' health and safety. The standards are **CLEAR TO WEAR (CTW)** and **SAFE TO WEAR (STW)**, which have the aim of:

- > monitoring and ensuring the production chain of all clothing, footwear and accessories sold from Inditex group
- > monitoring and continuously updating the standard indicators to comply with the most severe worldwide quality standards

WHO HAS DEFINED THE STANDARDS?

In-house managers and experts worked closely with the Santiago di Compostela (Spain) university team defining the standards.

WHAT DO THE STANDARDS CONCERN?

The standards are applied to all the items sold from Inditex Group

WHAT ARE THE STANDARDS AIMS?

The standards set out specific technical information to produce consumer goods respecting the health and safety of consumers, workers and environment as well as the workplaces standards.

WHERE IS THE STANDARD APPLICABLE?

- > Shoes of any brand of Inditex Group
- > Accessories of any brand of Inditex Group
- > Clothing of any brand of Inditex Group



WHAT DOES KIIAN DIGITAL CERTIFY?

Kiian Digital yearly, or whenever is needed, certifies its range referring to the CLEAR TO WEAR standard for the following chemical classes of risks:

- > Arylamine
- > Allergenic Azo-dyes
- > Cadmium
- > Lead
- > pH value
- > Formaldehyde
- > Chlorinated organic compounds
- > PVC presence
- > Organotin compound

Furthermore, Kiian Digital, in order to better protect consumers, certifies its range referring to the following fastness:

- > to water
- > to perspiration
- > to saliva
- > to dry rubbing
- > to wet rubbing

WHO DOES THE ANALYSIS ON BEALFH OF KIIAN DIGITAL?

All the tests related to CLEAR TO WEAR INDITEX standard are made by **SGS**, the officially Lab approved by INDITEX Group. SGS is present worldwide thanks to a wide network of subsidiaries and labs.

USEFUL LINKS

To know more about the SGS lab, visit www.sgs.com/en/Chemical.aspx

To know more about Inditex standards, visit www.inditex.com/en/sustainability

OEKO-TEX® STANDARD 100

(Independent textile standard)

The international **OEKO-TEX®** association was founded at the beginning of the 1990s in response to the demand of the public for textiles, which are harmless to health. The association has developed a standard, which allows consumers to measure textile quality on scientific basis for the objective evaluation of potentially harmful substances in textiles.

WHAT DOES OEKO-TEX® STANDARD DO?

The association has generated a label easily identifiable from the consumers, which responds to a unique safety standard for the assessment of harmful substances for manufacturers. The standard criteria are based on:

- > Uniform and scientifically-based test criteria
- > Annual re-evaluation of the defined limit values and criteria
- > Analysis and certifications made by Independent laboratories

WHO HAS DEFINED THE STANDARD?

It has been defined from the International Oeko-Tex® Association members based in Europe and Japan.

WHAT DOES THE STANDARD RELATE TO?

The standard covers all the textile garments, toys made by fabric and all the furnishing textile materials.

WHAT IS THE STANDARD AIM?

The standard sets out specific technical information to produce consumer goods respecting the health and safety of consumers, workers and environment as well as the workplaces standards.

WHERE IS THE STANDARD APPLICABLE?

- > Textiles and textile toys for babies and small children up to the age of three
- > Textile items to wear: from underwear to technical articles
- > Furnishing materials used for decorative purposes



IMPORTANT THINGS TO REMEMBER

OEKO-TEX® is based on the following basics:

*“The more intensively a textile comes into contact with the skin (and the more sensitive is the skin),
The higher the human ecological requirements to be met.”*

For this reason, the standard splits the items and the resulting tests for harmful substances according to 4 product classes, which are:

Product class I:

Textiles and textile toys for babies and small children up to the age of three, e.g. underwear, romper suits, bed linen, bedding, soft toys etc.

Product class II:

Textiles which, when used as intended, have a large part of their surface in direct contact with the skin, e.g. underwear, bed linen, terry cloth items, shirts, blouses etc.

Product class III:

Textiles which, when used as intended, have no or only a little part of their surface in direct contact with the skin, e.g. jackets, coats, covering materials etc.

Product class IV:

Furnishing materials for decorative purposes such as table linen and curtains, but also textile wall and floor coverings etc.



WHAT DOES KIIAN DIGITAL CERTIFY?

Kiian Digital yearly or whenever is needed, - referring to OEKO-TEX® standard - and after customer specific requirement issues a **Compliance Declaration**. The validity of this Declaration is in accordance with the expiry date of the standard release and in any case, the validity is no longer than 12 months.

WHO DOES LEAD THE TEST ANALYSIS ON BEALFH OF KIIAN DIGITAL?

The tests related to the **OEKO-TEX®** are made by one of the officially independent laboratories approved by the association.

USEFUL LINKS

To know more about OEKOTEX association, visit www.oeko-tex.com

KIIAN DIGITAL CERTIFIED PRODUCTS

Kiian Digital certifies its ranges according to the standards indicated in this document; the table below summarizes compliance by range.

The information contained in the table is effective at the date of this document. The confirmation of both the list of certified series and the standards to which Kiian Digital refers to must always be requested to our R&D Management.

INK SERIES	ADIDAS A01	INDITEX CTW	OEKOTEX STD 100	NIKE RSL
DIGISTAR E-GOLD	☺	☺	☺	
DIGISTAR HI-PRO	☺	☺	☺	☺
DIGISTAR PES ELITE	☺		☺	
DIGISTAR PES UPPER			☺	
DIGISTAR GEN-R			☺	
DIGISTAR K-ONE	☺		☺	☺
DIGISTAR PES HD ONE	☺	☺	☺	
DIGISTAR WR-500			☺	
DIGISTAR TUNE			☺	
DIGISTAR AIR			☺	
DIGISTAR TEX-R			☺	
DIGISTAR E-SUN			☺	
DIGISTAR SUBLI-SONIC			☺	
DIGISTAR K-CHOICE			☺	



INFORMATION AND INFORMATION SOURCES

SOME IMPORTANT NOTES

The information contained in this technical sheet is not intended to be exhaustive. Any person using a product branded Kiian Digital for any purpose other than those specifically recommended in our technical literature without first obtaining written confirmation from us does so at his own risk.

Kiian Digital brand places on the market products that meet the general safety requirement as defined by the current European Regulation. It also provides the consumer with information related to the evaluation of the risks associated to the use of a product when these are not immediately perceived. It also adopts the necessary measures to prevent such risks.

While we endeavour to ensure that all advice contained in this document is correct, (although we are constantly striving to ensure that all advices contained in this document and in our technical documentation about the product are correct), we have no control over either the quality or condition of the substrate or over the many factors affecting the use and application of the product.

Therefore, unless we specifically agree to do so in writing, we do not accept any liability whatsoever arising from or relating to the performance of our product or for any loss or damage arising from a non-authorized use of our product.

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REFERENCE SOURCES

All the information about companies and associations mentioned in this document has been found on their websites. In specifics:

- > Adidas group: <http://www.adidas-group.com>
- > Inditex group: <http://www.inditex.com>
- > Oekotex association : <https://www.oeko-tex.com>

All the information included in this document is subjected to audit based on our experience and ongoing improvement policy.