SECTION 1: Identification of the substance/mixture and of the company/undertaking

1 Product identifier the product Isantin (mixture)

Product codes : Isantin B, Isantin W

„safety data sheet according to (EG) Nr. 1907/2006“

Substance name	CAS-nunber	weight %	conz. limit	density g/cm³, 20°C	EG-number	IUPAC name
E-Indigo (purified) (C.I. 73000) no UVCB	482-89-3 naturalis: 68651-46-7	< 50	none	1.35	207-586-9	2-(3-hydroxy-1H-indol-2-yl)indol-3-one
Ethanol	64-17-5	> 10	≥ 30 %: H319	0.79	200-578-6	ethanol
2-Butanone, Methyl ethyl ketone (MEK)	78-93-3	≤ 1	≤ 2 %	0.805	201-159-0	butan-2-one
2-Propanol Isopropanol	67-63-0	≤ 1	≤ 2 %	0.78	200-661-7	propan-2-ol
Anisole Methoxybenzene	100-66-3	≥ 1	< 50 %	0.994	202-876-1	anisole
Hexan-1-ol n-Hexanol	111-27-3	≥ 1	< 50 %	0.815	203-852-3	hexan-1-ol

All of the substances in Isantin as a dispersion mixture are at least nature identical.

1.2 Relevant identified uses of the substance or mixture and uses advised against.

Relevant identified uses of the substance or mixture:

Gliding layer
Sector of use [SU]:
SU22 - Consumer uses: Private households (=general public = consumers)
Chemical product category [PC]:
PC15 - Non-metal-surface treatment products
Environmental Release Category [ERC]:
ERC 8a - Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)
ERC 8d - Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor)

Uses advised against:

No information available at present.

1.3 Details of the supplier of the safety data sheet

Isantin GmbH
Dr. Peter Bützer
Rebhaldenstrasse 2
CH- 9450 Altstätten
Phone: +41 71 755 40 08 **e-Mail**: info@isantin.ch
Competent person responsible for the safety data sheet: Dr. Peter Bützer

1.4 Emergency telephone number

Country Name	Street	Postcode/ City	Phone	Website
Germany Poison Centre Munich	Ismaninger Str. 22	D-81675 München	+49)89 19240	http://www.toxinfo.med.tum.de/inhalt/giftnotrufmuenchen
Austria (Poison Center) Vergiftungsinformationszentrale	Stubenring 6	A-1010 Vienna	+43 1 406 43 43	https://goeg.at
Switzerland (Poison Center) Tox Info Suisse	Freiestrasse 16	CH-8032 Zürich	+41 44 251 66 66 In case of emergency from abroad + 41 44 251 51	Info@toxinfo.ch

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008 (CLP), Classification as mixture (EG) 1272/2008, GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Substance name	CAS-number EC number	GHS Code	Source	Hazard Class	Hazard statement Code(s)	Signal-word	Pictogram Concentration Limits	Precautionary statements Code(s)
E-Indigo[1] (C.I. 73000)	482-89-3 207-586-9	-	ECHA	Aniline <0.1%	***purified: no H-code***	-	purified: no Label	pure no P
Ethanol	64-17-5 200-578-6	GHS02	ECHA	Flam.Liq. 2 STOT SE 3 Eye Irrit. 2	H225	Danger	 (≥ 50%: Eye Irrit. 2A, H319)	P210, P240, P305+P351+ P338 P403+P233
2-Butanone Methyl-ethylketone MEK	78-93-3 201-159-0	GHS02 GHS07	ECHA	Flam.Liq. 2 STOT SE 3 Eye Irrit. 2	H225, H319, H336	Danger	 C≥ 1%	P210, P305+P351+ P338, P403+P233
2-Propanol Isopropanol Propanol-2 Propan-2-ol	67-63-0 200-661-7	GHS02 GHS07	ECHA	Flam.Liq. 2 STOT SE 3 Eye Irrit. 2	H225, H319, H336	Danger	 C≥ 1%	P210, P233, P240, P305+P351+P3 38, P403+P235
Anisole Methoxy-benzene Phenoxy-methane	100-66-3 202-876-1	GHS02 GHS07	ECHA GESTIS	Flam.Liq. 3	H226, H315, H319, H336	Warning	 C≥ 1%	P210, P233, P241, P243. P280, P305+P351+ P338
1-Hexanol Hexan-1-ol n-Hexanol Amyl carbinol	111-27-3 203-852-3	GHS07	ECHA	Flam.Liq. 3 Acut.tox. 4 Eye Irrit. 2	H226, H302, H312, H319	Warning	 C≥ 1%	P210, P280, P301+P312+ P330, P302+P352+ P312, P305+P351+ P338

Remarks: Full text of hazard statements and EU hazard statements in SECTION 16.
Labelling for packaging not exceeding 125 ml is required, but not the H and P codes.

NFPA 704 Hazard Identification System

Substance	CAS-Nr.	Health	Flame	React	Special Hazard
Indigo	482-89-3	1	0	0	
Ethanol	64-17-5	1	3	0	
Anisole	100-66-3	1	2	0	
n-Hexanol	111-27-3	3	2	0	

2.2 Other hazards

Since the substances are flammable, avoid the formation of deposits and dust in the air. Avoid clouds of dust in a closed or unventilated room, as dust can form an explosive mixture with air, and any source of ignition, i.e. flame or spark, will cause fire or explosion. Dust clouds, which can be caused by the fine grinding of the solid after drying, represent a special danger.

SECTION 3: Composition/information on ingredients

3.1 Mixtures

In accordance with Annex II of Regulation (EC) nº1907/2006 (point 3), the product contains:

Substance name	CAS-number	Weight percent	Physical state	Colour	Odor	Molecular formula	Molar mass g/mol	pKa
E-Indigo (C.I.73000) rein	482-89-3 68651-46-7	≥ 3	solid	dark blue	dull, musty	$C_{16}H_{10}N_2O_2$	262.26	pKa_1: 8.0 pKa_2: 12.7
Ethanol	64-17-5	≥ 10 - ≤ 98	liquid	colourless	spirituous	C_2H_6O	46.07	15.7
2-Butanone	78-93-3	≤ 2	liquid	colourless	acetone-like	C_4H_8O	72.11	-
2-Propanol Isopropanol	67-63-0	≤ 2	liquid	colourless	alcohol-like	C_3H_8O	60.10	17.1 (25°C)
Anisole	100-66-3	< 50	liquid	colourless	anis-like spicy-sweet	C_7H_8O	108.14	-
1-Hexanol	111-27-3	< 50	liquid	colourless	sweetish	$C_6H_{14}O$	102.18	15.38
other mixture components	3734-33-6	< 0.1 resp. <0.0012	solid	colourless	odourless	$C_{21}H_{29}N_2O \cdot C_7H_5O$	446.58	4.05

SECTION 4: First aid measures

4.1 Description of first aid measures

The symptoms resulting from intoxication can appear after exposure, therefore, in case of doubt, seek medical attention for direct exposure to the chemical product or persistent discomfort.

By Inhalation

Remove the person affected from the area of exposure, provide with fresh air and keep at rest. In serious cases such as cardiorespiratory failure, artificial resuscitation techniques will be necessary (mouth to mouth resuscitation, cardiac massage, oxygen supply, etc.) requiring immediate medical assistance.

By skin contact

Remove contaminated clothing and footwear, rinse skin or shower the person affected if appropriate with plenty of cold water and neutral soap. In serious cases see a doctor. If the product causes burns or freezing, clothing should not be removed as this could worsen the injury caused if it is stuck to the skin. If blisters form on the skin, these should never be burst as this will increase the risk of infection.

By eye contact

Rinse eyes thoroughly with lukewarm water for at least 15 minutes. Do not allow the person affected to rub or close their eyes. If the injured person uses contact lenses, these should be removed unless they are stuck to the eyes, as this could cause further damage. In all cases, after cleaning, a doctor should be consulted as quickly as possible with the SDS of the product.

By ingestion/aspiration

Request medical assistance immediately, showing the SDS of this product. Do not induce vomiting, but if it does happen keep the head down to avoid aspiration. In the case of loss of consciousness do not administrate anything orally unless supervised by a doctor. Rinse out the mouth and throat, as they may have been affected during ingestion. Keep the person affected at rest.

4.2 Most important symptoms and effects, both acute and delayed

Acute and delayed effects are indicated in sections 2 and 11.

4.3 Indication of any immediate medical attention and special treatment needed: Non-applicable

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media

Co-ordinate fire-fighting measures to the fire surroundings

water spray, alcohol resistant foam, dry extinguishing powder, carbon dioxide (CO_2)

Unsuitable extinguishing media

water jet.

5.2 Special hazards arising from the substance or mixture

Combustible. In case of insufficient ventilation and/or in use, may form flammable/explosive vapour-air mixture**.**

The solid is poorly combustible but can lead to dust explosions when dry.

PACs (Protective Action Criteria)

country	name of agent	CAS-Nr.	Units	PAC-1	PAC-2	PAC-3	source
US	Indigo, dust	482-89-3	mg/m^3	-	8 (estimate)	-	U.S. DOE
US	Ethanol	64-17-5	ppm	1800	3300	15'000	U.S. DOE
US	2-Butanone	78-93-3	ppm	200	2700	4000	U.S. DOE
US	Isopropyl alcohol	67-63-0	ppm	200	2000	12000	U.S. DOE
US	Anisole	100-66-3	mg/m^3	1.6	18	110	U.S. DOE
US	1-Hexanol	111-27-3	ppm	10	110	580	U.S. DOE

Hazardous combustion products

In case of fire may be liberated: carbon monoxide (CO), carbon dioxide (CO_2), Nitrogen oxides (NOx), Do not inhale explosion and fire gases.

5.3 Advice for firefighters

Solvent vapours are heavier than air and may spread along floors. Beware of reignition. Fight fire with normal precautions from a reasonable distance. Wear self-contained breathing apparatus.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel

Do not breathe vapour/spray. Avoid contact with skin, eyes and clothes. Removal of ignition sources.

6.2 Environmental precautions

Keep away from drains, surface and ground water. Danger of explosion.

6.3 Methods and material for containment and cleaning up

Advices on how to contain a spill

Covering of drains.

Advices on how to clean up a spill

Absorb with liquid-binding material (e.g. sand, diatomaceous earth, acid- or universal binding agents).

Other information relating to spills and releases

Place in appropriate containers for disposal.

6.4 Reference to other sections

Hazardous combustion products: see section 5. Personal protective equipment: see section 8. Incompatible materials: see section 10. Disposal considerations: see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Provide adequate ventilation as well as local exhaustion at critical locations. Keep container tightly closed.

Measures to prevent fire as well as aerosol and dust generation

Keep away from sources of ignition - No smoking. Removal of dust deposits. Take precautionary measures against static discharge.

Advice on general occupational hygiene

Do not eat, drink or smoke when using this product. Wash hands before breaks and after work. Keep away from food, beverages and feed.

7.2 Conditions for safe storage, including any incompatibilities

Store in a well-ventilated place. Keep container tightly closed.

Incompatible substances or mixtures

Observe hints for combined storage.

Consideration of other advice

Ground/bond container and receiving equipment.

Ventilation requirements

Use local and general ventilation.

Specific designs for storage rooms or vessels

Recommended storage temperature: 15 – 25 °C.

7.3 Specific end use(s)

Usually used as dye, rarely as semiconductor or lubricant.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

National limit values

Occupational exposure limit values (Workplace Exposure Limits)

country	name of agent	CAS-Nr.	note	identifier	TWA [mg/m³]	STEL [mg/m³]	source
US	Indigo, dust	482-89-3	r	TWA	15		OSHA
US	Indigo, dust	482-89-3	r	TWA	3		ACGIH
US	Indigo, dust	482-89-3	i	TWA	10		ACGIH
DE	Indigo, dust	482-89-3	i	AGW	10	20	TRGS 900
DE	Indigo, dust	482-89-3	r	AGW	1.25	2.4	TRGS 900
CH	Indigo, dust	482-89-3	i	MAK	10		SUVA 2018
CH	Indigo, dust	482-89-3	r	MAK	3		SUVA 2018
US	Ethanol	64-17-5		TWA	1900	1900	OSHA
DE	Ethanol	64-17-5		AGW	960	1920	TRGS 900
CH	Ethanol	64-17-5		MAK	960	1920	SUVA 2022
US	2-Butanone	78-93-3		TWA	590	500	OSHA
DE	2-Butanone	78-93-3		AGW	600	600	TRGS 900
EU	2-Butanone	78-93-3		IOELV	600	900	2000/39/EG
CH	2-Butanone	78-93-3		MAK	590	590	SUVA 2017
US	Isopropyl alcohol	67-63-0		TWA	980	1225	NIOSH
DE	2-Propanol	67-63-0		AGW	200	500	TRGS 900
CH	2-Propanol	67-63-0		MAK	500	1000	SUVA 2017
US	Anisole	100-66-3		TWA	-	-	OSHA/NIOSH
DE	Anisole	100-66-3		AGW	-	-	TRGS 900
CH	Anisole	100-66-3		MAK	-	-	SUVA 2022
US	1-Hexanol	111-27-3		PEL/TLV	710	950	OSHA/ACGIH
DE	1-Hexanol	111-27-3		AGW	25	105	TRGS 900
CH	1-Hexanol	111-27-3		MAK	-	-	SUVA 2022

Notes: i: Inhalable fraction; A short-term exposure limit (STEL); Limit value which should not be exceeded, unless otherwise stated, based on a duration of 15 minutes,
r: alveolar fraction, SMW shift average (limit value for long-term exposure): time-weighted average measured or calculated over an 8-hour reference period.

Biological limit value

country	name of agent	parameter	Identifier	value mg/l	material	source
DE	2-Butanone	Ethyl methyl ketone	BLV	2	urine	DFG
DE	2-Butanone	Ethyl methyl ketone	BLV	2	urine	TRGS 903
DE	2-Propanol	Acetone	BLV	25	blood	TRGS 903
DE	2-Propanol	Acetone	BLV	25	urine	TRGS 903

Human health values DNEL of components of the mixture

name of agent	CAS-Nr	end-point	threshold level	protection goal, route of exposure	used in	exposure time
Indigo	68651-46-7	DNEL	10 mg/m³	human, inhalative dust	workers (industry)	acute - systemic effects
Indigo	68651-46-7	DNEL	3 mg/m³	human, respirative dust	workers (industry)	acute - systemic effects
Ethanol	64-17-5	DNEL	1.900 mg/m³	human, inhalative	workers (industry)	acute - systemic effects
Ethanol	64-17-5	DNEL	343 mg/kg	human, dermal	workers (industry)	chronic - systemic effects
Ethanol	64-17-5	DNEL	950 mg/m³	human, inhalative	workers (industry)	chronic - systemic effects
2-Butanone	78-93-3	DNEL	1161 mg/kg/day	human, dermal	workers (industry)	chronic - systemic effects
2-Butanone	78-93-3	DNEL	600 mg/m³	human, inhalative	workers (industry)	chronic - systemic effects
2-Propanol	67-63-0	DNEL	500 mg/m³	human, inhalative	workers (industry)	chronic - systemic effects
2-Propanol	67-63-0	DNEL	888 mg/kg /day	human, dermal	workers (industry)	chronic - systemic effects
Anisole[2]	100-66-3	DNEL	3 000 mg/m³	human, inhalative	workers (industry)	subacute to chronic systemic effects
1-Hexanol	111-27-3	DNEL	99 mg/m³	human, inhalative	workers (industry)	chronic - systemic effects)
1-Hexanol	111-27-3	DNEL	210 mg/m³	human, inhalative	workers (industry)	chronic - local effects
1-Hexanol	111-27-3	DNEL	28 mg/kg bw/day	human, dermal	workers (industry)	chronic - systemic effects
1-Hexanol	111-27-3	DNEL	190 µg/cm²	human, dermal	workers (industry)	chronic - local effects

environmental values (note: the solubility of indigo in water: ~0.001 mg/cm^3)

name of agent	CAS-Nr.	end-point	threshold level	environment compartment	exposure time
Indigo	482-89-3 68651-46-7	PNEC	7.8 mg/cm^3	freshwater	continuous
Ethanol	64-17-5	PNEC	0.79 mg/cm^3	marine water	continuous
Ethanol	64-17-5	PNEC	2.75 mg/cm^3	air	continuous
Ethanol	64-17-5	PNEC	3.6 mg/cm^3	freshwater sediment	continuous
Ethanol	64-17-5	PNEC	0.96 mg/cm^3	freshwater	continuous
Ethanol	64-17-5	PNEC	580 mg/cm^3	sewage treatment plant (STP)	continuous
Ethanol	64-17-5	PNEC	0.63 mg/cm^3	soil	continuous
2-Butanone	78-93-3	PNEC	55.8 mg/cm^3	marine water	continuous
2-Butanone	78-93-3	PNEC	55.8 mg/cm^3	air	continuous
2-Butanone	78-93-3	PNEC	285 mg/cm^3	freshwater sediment	continuous
2-Butanone	78-93-3	PNEC	55.8 mg/cm^3	freshwater	continuous
2-Butanone	78-93-3	PNEC	709 mg/cm^3	sewage treatment plant (STP)	continuous
2-Butanone	78-93-3	PNEC	22.5 mg/cm^3	soil	continuous
2-Propanol	67-63-0	PNEC	160 mg/kg	water	short-term exposure
2-Propanol	67-63-0	PNEC	140.9 mg/l	water	intermittent release
2-Propanol	67-63-0	PNEC	140.9 mg/l	freshwater	short-term exposure
2-Propanol	67-63-0	PNEC	140.9 mg/l	marine water	short-term exposure
2-Propanol	67-63-0	PNEC	2251 mg/l	sewage treatment plant (STP)	short-term exposure
2-Propanol	67-63-0	PNEC	552 mg/kg	freshwater sediment	short-term exposure
2-Propanol	67-63-0	PNEC	552 mg/kg	marine water sediment	short-term exposure
2-Propanol	67-63-0	PNEC	28 mg/kg	soil	short-term exposure
Anisole	100-66-3	PNEC	27 µg/l	freshwater	short-term exposure
Anisole	100-66-3	PNEC	2.7 µg/l	marine water	short-term exposure
Anisole	100-66-3	PNEC	30 mg/l	marine water sediment	short-term exposure
Anisole	100-66-3	PNEC	0.745 mg/kg	freshwater sediment	short-term exposure
Anisole	100-66-3	PNEC	0.074 mg/kg	marine water sediment	short-term exposure
Anisole	100-66-3	PNEC	0.133 mg/kg	soil	short-term exposure
1-Hexanol	111-27-3	PNEC	0.26 mg/L	freshwater	short-term exposure
1-Hexanol	111-27-3	PNEC	0.026mg/L	marine water	short-term exposure
1-Hexanol	111-27-3	PNEC	0.12 mg/kg	soil	short-term exposure
1-Hexanol	111-27-3	PNEC	1.4mg/kg	freshwater sediment	short-term exposure
1-Hexanol	111-27-3	PNEC	0.14mg/kg	marine water sediment	short-term exposure

8.2 Exposure controls

Individual protection measures (personal protective equipment)

Eye/face protection

Use safety goggle with side protection.

Skin protection

hand protection

Wear suitable gloves. Chemical protection gloves are suitable, which are tested according to EN 374.
For special purposes, it is recommended to check the resistance to chemicals of the protective gloves mentioned above together with the supplier of these gloves.

type of material

Butyl caoutchouc (butyl rubber), NBR (nitril caoutchouc)

material thickness

0.7 mm.

breakthrough times of the glove material

>30 minutes (permeation level: 2)

other protection measures

Take recovery periods for skin regeneration. Preventive skin protection (barrier creams/ointments) is recommended.
Flame-retardant protective clothing.

Respiratory protection

Respiratory protection necessary at: Aerosol or mist formation. Type: A (against organic gases and vapours with a boiling point of > 65 °C, colour code: Brown)., Dust formation. Particle filter device (EN 143). P1 (filters at least 80 % of airborne particles, identification colour: white). The wearing time limits according to GefStoffV in conjunction with the rules for the use of respiratory protection equipment (BGR 190) must be observed.

Environmental exposure controls

Keep away from drains, surface water and ground water.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties (E-Indigo as solid in dispersion)

Appearance	
Physical state	solid/liquid (dispersion)
Colour	dark blue, copper lustre
Odour	some acetone similar, dull/musty
Odour threshold	no data available for pure Indigo
Other physical and chemical characteristics of solids	
pH-value	7.5 - 9 (20 °C)
Melting point/freezing point	approx. 390-392 °C (sublimation approx. 170 °C)
Boiling start and boiling range	first sublimation, then decomposition
Flash point	> 220 °C
Evaporation rate	no data available
Flammability (solid, gaseous)	> 350 °C (Auto-ignition temperature)
Explosion limits	
• lower explosion limit (LEL)	ca. 200 g/m³ (dust) = minimum explosible concentration (MEC)
• upper explosion limit (UEL)	no data available
Explosion limits of dust/air mixtures	dust explosion of over 200 g/m³ was observed. The minimum ignition energy is between 320 and 650 mJ with a particle size up to 330 µm
Vapour pressure	< 3.5×10^{-5} Pa at 100°C
Density	approx.1.35 g/cm³at 20 °C (PubChem) bis 1.50 (crist.)
Vapour density	No data available.
Relative Density, vapour/air-mixture (air=1)	No information is available on this property
Solubilities: Water solubility	0.99 mg/L (25 °C, SIDS), 0.05 mg/L (ECHA)
Partition coefficient: n-octanol/water (log Kow)	2.7 (23 °C, SIDS); 3.72 (TOXNET)
Auto-ignition temperature	No information is available on this property
Decomposition temperature	>= 400 °C (E-indigo)
Viscosity	Not relevant (solid)
Explosive properties	dust
Oxidising properties	none

Note: The different tautomers of indigo can have different properties in different environments

Other physical and chemical parameters: Dispersing agent (liquid)

Physical state	liquid
Colour	colourless
Odour	anise-like, spicy-sweet, spritty, similar to acetones, dull/musty
Odour threshold	Anisol: 0.057ppm, Ethanol: 10 ppm, 2-Butanon: 5-8 ppm, 1-Hexanol: 10 ppm, no data for Indigo
pH-Wert	7 (water: 10 g/l 20 °C), pKa: 16 (Ethanol)
Melting point/freezing point	ca. -114 °C/78 °C
Boiling start and boiling range	79-153 °C
Flash point	17.5-44 °C (90 mass-%)
Evaporation rate	8.3-20 (start → end)
Flammability (solid, gaseous)	> 350 °C (Auto-ignition temperature)
Explosion limits	
• lower explosion limit (LEL)	3.1 Vol-%
• upper explosion limit (UEL)	27.7 Vol-%
Vapour pressure	58.0 hPa 20 °C
Density	0.79-0.99 g/cm³
Relative gas density	Ethanol: 1.59, 2-Propanol: 2.1, 2-Butanone: 1.03, Anisole: 3.7, 1-Hexanol: 4.01
Relative Density, vapour/air-mixture (air=1)	approx. 0.79 g/cm³ at 20 °C

Solubility(ies): Water solubility (20°C) mg/L	Anisole: 1710, Ethanol, 2-Propanol: completely miscible, 2-Butanone: 210'000, 1-Hexanol: 5'900
Partition coefficient: n-Octanol/water (log Kow)	Ethanol: -0.31, 2-Propanol: 0.05, 2-Butanone: 0.29, Anisole: 2.11, 1-Hexanol: 2.03 (GESTIS), Indigo. 2.7 (20 °C, SIDS); 3.72 (TOXNET)
Auto-ignition temperature	Ethanol: 400 °C, 2-Propanol: 399 °C, 2-Butanone: 505 °C, Anisole: 475 °C, 1-Hexanol: 290 °C
Decomposition temperature	E-Indigo: >= 400 °C; Decomposition of anisole starts at 477°C and a conversion degree of 50% is obtained at about 577°C, 1-Hexanol: No data available for decomposition
Viscosity	Ethanol: 1.144 mPa·s (20 °C), 2-Butanone: 0.4284 mPa·s (20°C), 2-Propanol: 1.96 mPa·s (25 °C), Anisole: 1.52 mPa·s (15 °C); 0.778 mPa·s (30° C) 1-Hexanol: 0.592 mPa·s (25 °C)
Explosive properties	Shall not be classified as explosive
Oxidising properties	none

9.2 Other information

For ethanol: Temperature class (EU, acc. to ATEX) T2 (Maximum permissible surface temperature on the equipment: 300°C)
During evaporation of the dispersed indigo, the high-boiling liquids anisole and 1-hexanol are finally released. If you don't tolerate the smell well, you should work in a well-ventilated room.

SECTION 10: Stability and reactivity

10.1 Reactivity

Risk of ignition. Vapours can form explosive mixtures with air. The dry product is not dust explosive in the delivered form; however, the accumulation of fine dust leads to a dust explosion hazard.

10.2 Chemical stability

The material is stable under normal ambient and anticipated storage and handling conditions of temperature and pressure. Indigo: stable in organic solvents up to at least 250°C (ECHA). All components of the Isantin-dispersion do not react chemically with each other.

10.3 Possibility of hazardous reactions

Violent reaction with: Alkali metals, Alkaline earth metal, Acetic anhydride, Peroxides, Phosphorus oxides (e.g. P2O5), Strong oxidiser, Nitric acid, Nitrate, Perchlorates, => Explosive properties

10.4 Conditions to avoid

Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

10.5 Incompatible materials

Certain plastics and rubbers

10.6 Hazardous decomposition products

Hazardous combustion products: see section 5.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Toxicokinetic (Absorption, Distribution, Metabolism and Excretion)

name	administration	species	bile (%)	urine (%)	feces (%)	time	source
Indigo	intravenous	rat	25	35	43	7h	ECHA
Indigo	oral	rat		9-11	77-87	72h	ECHA
Indigo	oral	rat		4	78	72h	ECHA
Indigo	dermal	rat		0.8			ECHA

Excretes via urine, bile and feces contained only 0.5% to 2% unchanged Indigo: 98% metabolites.
Bioavailability of approximately 33% to 58%; oral absorption of about 20%; very limited dermal absorption of indigo: 0.3%.
There are no hints for a possible bioaccumulation of indigo.

Acute toxicity

The mixture shall not be classified as acutely toxic.

name of agent	exposure route	endpoint	value	species	source
Indigo[a]	oral	LD_{50} LD_{50} LD_{50}	> 3160 mg/kg > 5000 mg/kg > 6400 mg/kg	rat	ECHA SIDS ECHA
Indigo	inhalative: dust	LC_{50}	0.08 mg/l/4hr	rat	SIDS
Indigo	dermal	LD_{50} LD_{50}	2000 kg > 2500 mg/kg bw	rat	SIDS ECHA
Indigo	intraperitoneal	LD_{50}	~ 8000 mg/kg bw	mouse	ECHA
Indigo	oral	LC_{50}	5.3 mg/L (4h)	rat	SIDS
Indigo	oral	LC_{50}	> 2000 mg/kg	rabbit	SIDS
Indigo	oral	NOEL	1,200 mg/kg/day: repeated dose toxicity 500 mg/kg/day:reproductive toxicity, offspring 500 mg/kg/day: Teratogenicity 500 mg/kg/day: parenteral	rat	SIDS
Indigo	oral	EDLC	12 mg/kg/day: repeated dose 5 mg/kg/day:reproductive toxicity	human	SIDS
Ethanol	oral	LD_{50}	10470 mg/kg 15010 mg/kg	rat	OECD-401 SIDS
Ethanol	oral	LD_{50}	8300 mg/kg	mouse	SIDS
Ethanol	oral	NOAEL	2% (approximately 2400 mg/kg)	rat	SIDS
Ethanol	oral	LOAEL	3 % (approximately 3600 mg/kg)	rat	SIDS
Ethanol	inhalative: vapour[b]	LC_{50}	125 mg/l/4hr	rat	OECD-403
Ethanol	inhalative: vapour	LC_{50}	> 60'000 ppm	mice	SIDS
Ethanol	inhalative: vapour	conc.	5000 ppm (irritating and uncomfortable to breathe but tolerable)	human	SIDS
Ethanol	dermal	LDL_0	> 20,000 mg/kg	rabbit	SIDS
Ethanol	intraperitoneal	LD_{50}	9710 mg/kg (male) 9450 mg/kg (female)	mice	SIDS
2-Butanone	oral	LD_{50}	2600-5400 mg/kg	rat	SIDS Draft
2-Butanone	inhalative: vapour	LD_{50}	> 5000 mg/kg	rat	SIDS Draft
2-Propanol	inhalative: vapour	LC_{50}	72.6 mg/l/4h	rat	SIDS
2-Propanol	oral	LD_{50}	4710 - 5840 mg/kg	rat	SIDS
Anisole	inhalative: vapour	LC_{50}	> 6.51 mg/l/4h	rat	ECHA
Anisole	oral	LD_{50}	3700 mg/kg	rat	TOXNET
1-Hexanol	oral	LD_{50}	720 mg/kg	rat	TOXNET
1-Hexanol	inhalative: vapour	LC_{50}	> 1060 ppm/6H	rat	TOXNET
1-Hexanol	dermal	LD_{50}	3100 µL/kg	rabbit	TOXNET

a) Indigo: For human health, the estimated dose of low concern (EDLC) has been calculated at 12 mg/kg/day and 5 mg/kg/day for repeated dose and reproductive toxicity respectively, using a safety factor of 100 (SIDS).
b) Vapours may cause drowsiness and dizziness.

Repeated toxicity of Indigo: NOEL 1200 mg/kg/day (rat, SIDS).

- **Skin corrosion/irritation**
  - Indigo has no irritating potential to skin or mucous membranes (ECHA).
  - Ethanol: not irritating to skin (SIDS)
  - Anisol: Causes skin irritation; 1-Hexanol: Causes mild skin irritation.
- **Serious eye damage/eye irritation**

- Causes serious eye irritation (most by Ethanol).

- **Respiratory or skin sensitisation**
  - Indigo: No sensitizing effects observed in animal and human studies (ECHA
  - May cause respiratory tract irritation.

- **Summary of evaluation of the CMR properties**
  - Indigo is not genotoxic, therefore, no classification is necessary (ECHA).
  - Indigo: No effects on reproduction observed, no classification necessary. The NOEL is considered to be 500 mg/kg/day for reproductive toxicity (SIDS)
  - Indigo: NOEL is considered to be 500 mg/kg/day for developmental toxicity (SIDS).
  - Indigo: There were no adverse effects noted up to the highest dose levels tested, with Indigo containing up to 3% aniline and methylaniline as a sum (ECHA).
  - In a micronucleus test in mice at concentrations of 0, 0.1, 0.5, 1.0, 2.0 mg/kg, Indigo showed negative results (OECD, SIDS).
  - Ethanol is not considered to be mutagenic to E. coli and S. typhimurium bacteria (SIDS).
  - There is no convincing evidence that ethanol induces micronuclei in the bone marrow of rodents (SIDS).
  - No chromosome aberrations were found (SIDS).

The liquid shall not be classified as germ cell mutagenic, carcinogenic nor as a reproductive toxicant. The solid Indigo is not classified as germ cell mutagenic, carcinogenic or toxic for reproduction (ECHA). (Toxic to reproduction/teratogenic advice: Indigo: NOEL F1 offspring = 500 mg/kg/day; SIDS).

- **Specific investigations**
  - It was concluded that the use of Indigo6 to color either collagen or catgut sutures does not affect their safe use in opthalmological procedures.

components, CAS-Nr.	ACGIH - Carcinogens	IARC	NTP	OSHA HCS - Carcinogens
Indigo, 482-89-3	Not listed	Not listed	Not listed	Not listed
Ethanol, 64-17-5	Not listed	Not listed	Not listed	Not listed
2-Butanone, 78-93-3	Not listed	Not listed	Not listed	Not listed
2-Propanol, 67-63-0	Not listed	Not listed	Not listed	Not listed
Anisole, 100-66-3	Not listed	Not listed	Not listed	Not listed
1-Hexanol, 111-27-3	Not listed	Not listed	Not listed	Not listed
Denatoniumbenzoate, 3734-33-6	Not listed	Not listed	Not listed	Not listed

Carcinogenicity: No ingredient of this product present in a concentration equal to or greater than 0.1% is identified by IARC as a probable, possible or proven carcinogen for human exposure.

- **Specific target organ toxicity - single exposure**

Shall not be classified as a specific target organ toxicant (single exposure).

- **Specific target organ toxicity - repeated exposure**

Shall not be classified as a specific target organ toxicant (repeated exposure).

- **Aspiration hazard**

May cause respiratory tract irritation.

Symptoms related to the physical, chemical, and toxicological characteristics

- **If swallowed**

Gastro-intestinal problems, nausea, vomiting. May damage the liver and kidneys if swallowed during prolonged or repeated exposure.

- **If in eyes**

Causes serious eye irritation

- **If inhaled**

vertigo, Inebriation, narcosis, breathing difficulties

- **If on skin**

Prolonged or repeated skin contact may cause removal of natural fat from the skin resulting in dermatitis (skin inflammation)

Other information

Based on experimental values and their interpretation, indigo did not show harmful systemic or local effects at either short- or long-term exposure. Therefore, there is no risk to the consumer from the intended use of the respective articles (ECHA).

Indigo: Endocrine Disruptors: Estrogenic, Androgenic and Thyroid Receptors: No Alerts (QSAR: OPERA, VEGA)

SECTION 12: Ecological information

12.1 **Toxicity** according to 1272/2008/EC: not to be classified as hazardous to water.

(Acute) aquatic toxicity (source: SIDS) (note: the water solubility of indigo: 0.99 mg/L)

name of agent	Log (K_{OW})	endpoint	value	species	exposure time	source
Indigo	3.1	NOEC EC_{25} EC_{50}	1000 mg/kg > 1000 mg/kg > 1000 mg/kg	soybean: shoot height, shoot fresh weight, number of emerged seedlings	21d	ECHA
Indigo	3.1	LC_{50} LC_{50} LC_{50}	>1000 mg/l >1000 mg/l >1000 mg/l	Fish (Oryzias latipes) acute	24 h 72 h 96 h	OECD-SIDS
Indigo	3.1	LC_{50} EC_{50} EC_{50} (Reprod.) NOEC (Reprod.)	2.6 mg/l 250 mg/l 1.6 mg/l 0.78 mg/l	Daphnia magna	21 d acute 21 d 21d	OECD-SIDS
Indigo	3.1	EC_{50} NOEC	6.5 mg/l 3.1 mg/l	Selenastrum Capricornutum (Algae)	72 h	OECD-SIDS
Indigo	3.1	EC_{50} or LC_{50}	1 000 mg/kg soil dw	macroorganisms	Short-term	ECHA
Indigo	3.1	LC_0	>1000 mg/kg soil	earthworms (Eisenia foetida)	14d	ECHA
Indigo	3.1	LC_{50}	>1000 mg/kg soil	earthworms (Eisenia foetida)	14d	ECHA
Indigo	3.1	LC_{100}	>1000 mg/kg soil	earthworms (Eisenia foetida)	14d	ECHA
Indigo	3.1	NOEC	62.5 - 1000 mg/kg	earthworms (Eisenia foetida)	14d	ECHA
Ethanol	-0.3	EC_{50}	12'340 mg/l	Daphnia magna	48 h	OECD-SIDS
Ethanol	-0.3	LC_{50}	1000 mg/l	Palaemonetes kadiakensis	18 h	OECD-SIDS
2-Butanone	0.29	LC_{50}	7060 mg/l	Daphnia magna	48 h	SIDS
2-Butanone	0.29	LC_{50}	3220 mg/l	Pimephales promelas	96 h	SIDS
2-Propanol	0.05	LC_{50}	> 10'000 mg/l	Daphnia magna	24 h	SIDS
2-Propanol	0.05	LC_{50}	9640 mg/l	Pimephales promelas	96 h	SIDS
Anisole	2.11	EC_{50}	27 mg/l	Daphnia magna	48 h	ECHA
Anisole	2.11	LC_{50}	>1 mg/l	Zebrafish (Danio rerio)	96 h	ECOTOX Database
Anisole	2.11	ErC_{50}	47 mg/l	Algae	72 h	ECHA
1-Hexanol	2.03	LC_{50}	120 mg/l	Fish	96 h	GESTIS
1-Hexanol	2.03	LC_{50}	97.5 mg/l	Fathead minnow	96 h	PubChem
1-Hexanol	2.03	LC_{50}	130 mg/l	Leuciscus idus (Golden orfe)	48 h	PubChem
1-Hexanol	2.03	ErC_{50}	79.7 mg/l	Algae	72 h	ECHA

Aquatic toxicity (chronic) (note: the water solubility of indigo: 0.99 mg/L)

name of agent	Log (K_{OW})	endpoint	value	species	exposure time	source
Indigo	3.1	LC_{50}	2.6 mg/l	Daphnia magna	21d	SIDS
Indigo	3.1	EC10, LC10 or NOEC	1 000 mg/kg soil dw	soil macroorganisms	Long-term	ECHA
Ethanol	-0.3	LC_{50}	11'200 mg/l	Salmo gairdneri	96 h	SIDS
Ethanol	-0.3	LC_{50}	12'340 mg/l	Daphnia magna	48 h	SIDS
2-Butanone	0.29	LC_{50}	3220 mg/l	Pimephales promela	48 h	SIDS
2-Butanone	0.29	LC_{50}	5091 mg/l	Daphnia magna	48 h	SIDS
2-Propanol	0.05	NOEC	141 mg/l	Daphnia magna (Crustacea)	16 d	SIDS

name of agent	Log (K_{OW})	endpoint	value	species	exposure time	source
Anisole	2.11	EC_{50}	27 mg/l	Freshwater invertebrates	48 h	ECHA
Anisole	2.11	EC_{50}	162	Freshwater algae	4 d	ECHA
Anisole	2.11	NOEC	300 mg/l	Microorganisms	3 h	ECHA
1-Hexanol	2.03	NOEC	6.8 - 13.0 mg/L	Daphnia magna	21 d	ECHA
1-Hexanol	2.03	EC10	3.6 – 16.8 mg/L	Daphnia magna	21 d	ECHA

12.2 Process of degradability

Indigo: CAS no. 482-89-3, EC no. 207-586-9, InChI Key: COHYTHOBJLSHDF-BUHFOSPRSA-N. Not readily biodegradable (622 days at pH 4, 25 °C, (SIDS), but there is no evidence of possible bioaccumulation of indigo (ECHA). Theoretical oxygen demand with nitrification: 2.211 mg/mg. Direct photolytic degradation in water: $T_{1/2}$ = 0.112 y (SIDS). In soil: anaerobic/bacterial: 90% in 60 days. Theoretical oxygen demand: Indigo: 1.952 mg/mg (BSB5: <150 mg O_2/g), Anisole: 2.52 mg/mg
Theoretical carbon dioxide: Indigo: 2,685 mg/mg (CBS: 1680 mg O_2/g), Anisole: 2,849 mg/mg
PEC (Predicted Effect Concentration) Indigo: The worst estimated concentrations are: 7.7-10-12 mg/l (air), 2.6-10-4 mg/l (water), 5.1-10-4 mg/kg (soil), 2.2-10-2 mg/kg (sediment), but the PNEC (Predicted No Effect Concentration) is: 0.0078 mg/l. As the PEC is lower than the PNEC, possible environmental damage is expected to be very small (SIDS).
Degradation products of indigo:
Isatin: CAS No. 91-56-5, EC number 202-077-8, name: 1H-indole-2,3-dione, InChI Key: JXDYKVIHCLTXOP-UHFFFAOYSA-N. LogP: 0.83, MP: 203°C, Relative density at 20C°: 1.471, water solubility approx. 15400 mg/l, vapour pressure: 1e-6 mmHg @ 25°C (est). acute toxicity rate LD_{50} (oral): 5000 mg/kg, Daphnia: EC_{50} (48 h): 692.43 mg/L (est.), Algae: Freshwater: EC_{50} (72 h): 329.98 mg/L, EC 1.4.3.4 (monoamine oxidase) inhibitor. Is further oxidatively converted to anthranilic acid via isatoic anhydride (then: $C_6H_4C_2O_3NH + ROH \rightarrow C_6H_4(CO_2R)(NH_2) + CO_2$).
Anthranilic acid: CAS no. 118-92-3; EC no.: 204-287-5, InChI Key: RWZYAGGXGHYGMB-UHFFFAOYSA-N water solubility: 3500 mg/L (20°C); log(Kow): 1.21 (TOXNET), Fish: LC_{50} = 100-200 mg/L (96h), Daphnia: EC_{50} = 85 mg/L (48h). Decomposition of anthranilic acid according to equation: $2\ C_7H_7NO_2 + 9\ O_2 \rightarrow 7\ CO_2 + NH_4^+ + NO_3^- + 5\ H_2O$.
Ethanol: Pseudo first-order half-lives of 15.4 hrs and 13.8 hrs. Biodegradation: wastewater 74% (5 d) to 95% (15d); synthetic seawater 45% (5d) to 75% (20d); 89% (14 d) (SIDS), no bioaccumulation log(BCF) = 0.5; Know: –0.31 (OECD, SIDS).
Anisole: Biodegradability approx. 68% (OECD test guideline 301D): readily biodegradable
1-Hexanol: 5-Day theoretical biochemical oxygen demands in aerobic screening tests using a sewage inocula of 28%, 53% (initial conc. of 100 ppm) and 83.6% (initial conc. of 2,000 ppm). An aerobic biodegradation half-life of 0.36 days, was determined in an aerobic screening test at pH 7 and 25 °C. In a similar screening test, the biodegradation half-life was 1.7 days. Anaerobic biodegradation degradation rates are 75% and 83% in 7 days at 37 °C using a synthetic sewage inocula.

Degradation rates

name of agent	process	degradation rate	time	source
Indigo	biotic/abiotic anaerobic/bacterial	0 % 90 %	28 d 60 d	SIDS ECHA
Ethanol	aerobic	95 %	15 d	SIDS
2-Butanone	aerobic	83 %	5 d	SIDS
2-Propanol	aerobic	49 %	5 d	SIDS
Anisole	aerobic water	50 % 56 %	22 h 14 d	PubChem ECHA
1-Hexanol	aerobic anaerobic	28-83.6 % 75-83 %	5 d 7 d	PubChem

Degradation product of anisole (only occurring in traces after application): Phenol (CAS No 108-95-2); InChI Key: RDOXTESZEPMUJZ-UHFFFAOYSA-N, water solubility: ~ 84 g/L (20 °C); log(Kow); 1. 46 (Hansch); Degradation rate biotic/abiotic: 85 % (14 d): The substance is readily biodegradable; Theoretical oxygen demand: 2.38 mg/mg; Theoretical carbon dioxide: 2.806 mg/mg; Biochemical oxygen demand: 1.68 g/g (5 h). Anisole was classified as readily biodegradable in an OECD 301C study. It is therefore not considered persistent in water, sediment and soil (ECHA).

Degradation of 1-Hexanol: 1-Hexanol is metabolized either by conjugation with glucuronic acid or by oxidation to carboxylic acids and further degradation to CO_2. Biodegradation studies show that 1-hexanol is expected to degrade rapidly in both aerobic and anaerobic conditions.

12.3 Bioaccumulative potential (BCF)

Indigo: log(BCF):	0.40-0.65 (SIDS), no bioaccumulative potential (ECHA)
n-Octanol/water (log Kow):	2.7 (23 °C, SIDS); 3.72 (TOXNET)
Ethanol: log(BCF):	0.5 (SIDS)
2-Butanone: log(BCF):	0.7 (freshwater fish, SIDS)
2-Propanol: log(BCF):	0 (freshwater fish, SIDS)
Anisole: log(BCF):	2.11 (PubChem)
1-Hexanol: log(BCF):	1.32 (PubChem)

12.4 Mobility in soil

E-Indigo: Sediments: 0.1-0.3 mg/kg (QSAR, EPI), Anisole: no data available.

12.5 Results of PBT and vPvB assessment

No substance in the mixture meets the criteria for PBT or vPvB according to Regulation (EC) No 1907/2006, Annex XIII

Summary:

Indigo, Ethanol, Anisol and 1-Hexanol have shown no adverse effects in aquatic ecotoxicity studies at the solubility limit or in terrestrial ecotoxicity and toxicity studies up to the highest dose tested and is therefore not toxic to organisms, plants, animals or human (ECHA).

Based on experimental information, anisole is classified as not dangerous for the aquatic environment (ECHA).

Long chain aliphatic alcohols like 1-Hexanol occur naturally in the environment.

12.6 Other adverse effects

Data are not available.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

This material and its container must be disposed of as hazardous waste. Dispose of contents/container in accordance with local/regional/national/international regulations. All components are combustible and are suitable in small quantities for residue-free waste incineration.

Sewage disposal-relevant information

Do not empty into drains.

Waste treatment of containers/packagings

It is a dangerous waste; only packagings which are approved (e.g. acc. to ADR) may be used.

13.2 Relevant provisions relating to waste

The allocation of waste identity numbers/waste descriptions must be carried out according to the EEC, specific to the industry and process.

13.3 Remarks

Waste shall be separated into the categories that can be handled separately by the local or national waste management facilities. Please consider the relevant national or regional provisions.

SECTION 14: Transport information

14.1	UN-number	1993 LQ, (Indigo: -, Ethanol: 3343, Anisole: 2222)
14.2	UN proper shipping name	lubricant
	Hazardous ingredients	Ethanol/Anisole/1-Hexanol
14.3	Transport hazard class(es)	class 3 (flammable liquids)

14.4	Packing group	II (medium danger)
14.5	Environmental hazards regulations)	none (non-environmentally hazardous acc. to the dangerous goods

14.6 Special precautions for user

Provisions for dangerous goods (ADR) should be complied within the premises.

14.7 Transport in bulk according to Annex II of MARPOL and the IBC Code

The cargo is not intended to be carried in bulk.

14.8 Information for each of the UN Model Regulations

Transport of dangerous goods by road, rail and inland waterway (ADR/RID/ADN)

UN-number	1993
Proper shipping name	lubricant
Particulars in the transport document	UN 1993, flammable, liquid substance, N.A.G., (Ethanol, Anisole), mixture, 3, II, (D/E)
Class	3 (flammable liquids)
Classification code	F1
Packing group	II (medium danger)
Class	3

Special provisions (SP)	144, 601
Excepted quantities (EQ)	E2
Limited quantities (LQ)	1 L
Transport category (TC)	2
Tunnel restriction code (TRC)	D/E
Hazard identification No	33
Emergency Action Code	2YE

International Maritime Dangerous Goods Code (IMDG)

UN-number	1993
Proper shipping name	lubricant
Particulars in the shipper's declaration	UN 1993, flammable, liquid substance, N.O.S. mixture (Ethanol, Anisole, 1-Hexanol), 3, II, 13°C c.c.
Class	3 (flammable liquids)
Packing group	II (medium danger)
Marine pollutant	-
Danger label(s)	3

Special provisions (SP)	144
Excepted quantities (EQ)	E2
Limited quantities (LQ)	1 L
EmS	F-E, S-D
Stowage category	A

Dangerous goods packed in excepted quantities: ADR (chapter 3.5), code E2 (3.5.1.2): Maximum net quantity per inner packaging for liquids: 30 ml and maximum net quantity per outer packaging: 500 ml.

14.9 International Civil Aviation Organization (ICAO-IATA/DGR)

UN number	1993
Proper shipping name	lubricant
Particulars in the shipper's declaration	UN 1993, flammable, liquid substance, N.O.S. mixture (Ethanol, Anisole, 1-Hexanol), 3, II, 13°C c.c
Class	3 (flammable liquids)
Packing group	II (medium danger)
Danger label(s)	3

Special provisions (SP)	A3, A58, A180
Excepted quantities (EQ)	E2
Limited quantities (LQ)	1 L

EU directive for hand luggage:

The cargo (> 100 ml) may not be carried by passengers or crew members.
Isantin as a liquid may only be carried in small quantities and in small individual containers of max. 100 ml in hand luggage. All individual containers must be packed in a transparent and resealable plastic bag with a maximum volume of 1 litre. Only one bag per person is permitted, and it must also be sealed. This bag must be presented separately at the security check.
It must be possible to close the bag with a firmly integrated zipper or a pressure seal; an extra clip or rubber is not permitted. A normal freezer bag equipped with such a closure is permitted.

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

Relevant provisions of the European Union (EU)
Regulation 649/2012/EU concerning the export and import of hazardous chemicals (PIC)
Not listed.
Regulation 1005/2009/EC on substances that deplete the ozone layer (ODS)
Not listed.
Regulation 850/2004/EC on persistent organic pollutants (POP)
Not listed.
Limitation of emissions of volatile organic compounds due to the use of organic solvents in certain paints and varnishes and vehicle refinishing products (2004/42/EC, Deco-Paint Directive)
VOC content >50 %
Directive on industrial emissions (VOCs, 2010/75/EU)
VOC content >50 %
EU Regulation No 649/2012 Concerning the Export and Import of Hazardous Chemicals (PIC)
No component is listed.
Verordnung 1005/2009/EG über Stoffe, die zum Abbau der Ozonschicht führen (ODS)
No component is listed.
Regulation 850/2004/EC on persistent organic pollutants (POPs)
No component is listed.
Restrictions under REACH, Annex XVII
No component is listed.
List of substances subject to authorisation (REACH, Annex XIV)
No component is listed.
Directive 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS) - Annex II
No component is listed.
Regulation (EC) No 166/2006 on the establishment of a European Pollutant Release and Transfer Register (E-PRTR)
No component is listed.
Directive 2000/60/EC establishing a framework for Community action in the field of water policy (WFD)
No component is listed.
Quantity thresholds under the Major Accidents Ordinance (StFV), 3rd updated edition, February 2017: 20'000 kg.
EPA Consolidated List of Lists
Indigo: No regulatory information available.
DHS Chemical Facility Anti-Terrorism Standards (CFATS)
Indigo: No regulatory information available.
OSHA Process Safety Management (PSM) Standard List
Indigo: No regulatory information available.

Directive 2012/18/EU (Seveso III): Qualifying quantity (tonnes) of dangerous substances as referred to in Article 3(10) for the application of:

No	Hazard categories in accordance with Regulation (EC) No 1272/2008	lower-tier requirements	upper-tier requirements
P5c	Flammable liquids, Categories 2 or 3 not covered by P5a and P5b	5'000	50'000

National Regulation (Germany): Verwaltungsvorschrift wassergefährdende Stoffe (VwVwS)
water hazard class (WGK): 1 (slightly hazardous to water)
identification number 818

Technical Instructions on Air Quality Control

substance	number	substance group	conc.	mass flow	mass conc.	note
Indigo	D 5.2.1	total dust, including micro dust	100 %	0.2 kg/h	20 mg/m³	1)
Indigo	A § 3 Abs. 1	dust precipitation		210 mg/(m²•d)		
Indigo	CH, 41	limit value for total dust		0.2 kg/h	20 mg/m³	
Ethanol/ 2-Butanone	D, 5.2.5	organic substances	≥ 25 mass.-%	0.5 kg/h	50 mg/m³	
Ethanol/ 2-Butanone	CH, 71	organic gaseous, vapour or particulate substances		3 kg/h	150 mg/m³	
2-Propanol	D	organic substances		0.5 kg/h	50 mg/m³	
Anisole	D, 5.2.5	organic substances	100 %	0.5 kg/h	50 mg/m³	
Anisole	CH, 124	organic substances			100 mg/m³	total carbon
1-Hexanol						
1-Hexanol						
solvents, surface cleaning	EU, 1-5 t/a				20 mg/m³	diffuse max. 15 %, 2)

Notes: 1) Even if a mass flow of 0.20 kg/h is maintained or undercut, the mass concentration in waste gas shall not exceed 0.15 g/m³.
2) Council Directive 1999/13/EC of 11 March 1999, Annex IIA, Thresholds and emission limit values, section 4.

- **Storage of hazardous substances in transportable containers (TRGS 510) (Germany)**
  Storage class (LGK): 3 (flammable liquids)
- **29CFR PART 1910.1200 (U.S.A)**
  Highly flammable liquid and vapor. Causes serious eye irritation. May cause drowsiness or dizziness.

Regulations of the insurance companies
Observe employment restrictions under the Youth Employment Protection Act (94/33/EC). Observe employment restrictions according to the Maternity Protection Directive Ordinance (92/85/EEC) for expectant or nursing mothers. The national legal regulations must also be observed! FOR EXAMPLE: Technical rules for hazardous substances.

National inventories
Substances are listed in the following national inventories (Ethanol: all):

country	national registries	Indigo, status	Anisole, status	1-Hexanol, status
AU	AICS	substance is listed	substance is listed	
CA	DSL	substance is listed	substance is listed	
CN	IECSC	substance is listed	substance is listed	
EU	ECSI	207-586-9	202-876-1	
EU	REACH Reg.	substance is listed	substance is listed	
KR	KECL	substance is listed	substance is listed	
MX	INSQ	substance is listed	substance is listed	
NZ	NZIoC	-	substance is listed	
PH	PICCS	substance is listed	substance is listed	
TR	CICR	substance is listed	-	
TW	TCSI	substance is listed	substance is listed	
US	TSCA	substance is listed	substance is listed	

Legend
AICS Australian Inventory of Chemical Substances
CICR Chemical Inventory and Control Regulation
DSL Domestic Substances List (DSL)
ECSI EG Substance list (EINECS, ELINCS, NLP)
IECSC Inventory of Existing Chemical Substances Produced or Imported in China
INSQ National Inventory of Chemical Substances
KECI Korea Existing Chemicals Inventory
NZIoC New Zealand Inventory of Chemicals
PICCS Philippine Inventory of Chemicals and Chemical Substances
REACH Reg. REACH registered substances
TCSI Taiwan Chemical Substance Inventory

TSCA Toxic Substance Control Act

15.2 Chemical Safety Assessment

Chemical safety assessments for the substances in this mixture, indigo, ethanol and anisole are completed (ECHA), but not for the mixture.

SECTION 16: Other information

Abbreviations and acronyms

abbreviation	Descriptions of the abbreviations used
ADN	Accord européen relatif au transport international des marchandises dangereuses par voies de navigation intérieures (European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways)
ADR	Accord européen relatif au transport international des marchandises dangereuses par route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
AGW	Arbeitsplatzgrenzwert (workplace limit value)
BLV	Biological Limit Value
CAS	Chemical Abstracts Service (service that maintains the most comprehensive list of chemical substances)
C.I.	Colour Index
CLP	Regulation (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures
CMR	Carcinogenic, Mutagenic or toxicic for Reproduction
DT_{50}	dissipation time, half-life for degradation in the environment (e.g. hydrolysis)
DNEL	Derived No Effect Level
EAK	Europäischer Abfall-Katalog: European Waste Catalogue
ECHA	European Chemical Agency
ECOTOX	ECOTOXicology knowledgebase (U.S. EPA)
EC_{50}	mean effective concentration
ED_{50}	effect dose 50%
EDLC	Estimated Dose of Low Concern
EINECS	European Inventory of Existing Commercial Chemical Substances
ELINCS	European List of Notified Chemical Substances
EPI	Estimation Programs Interface (U.S. EPA)
ErC_{10}	concentration of test substance which results in a 10 percent reduction in growth rate (mg/L)
ErC_{50}	average inhibition concentration of the growth rate
GESTIS	GESTIS is the Information system on hazardous substances of the German Social Accident Insurance
GHS	Globally Harmonized System of Classification and Labelling of Chemicals
IATA	International Air Transport Association
IMDG	International Maritime Dangerous Goods Code
Kow	n-octanol-water partition coefficient
KZW	Kurzzeitwert (Short term value)
LD_{50}	Letal Dose 50%
LGK	Storage class according to TRGS 510, Germany
LQ	Limited Quantity (ADR)
MAK	Maximale Arbeitsplatz-Konzentration: Maximum workplace concentration
MARPOL	International Convention for the Prevention of Pollution from Ships (abbr. of "Marine Pollutant")
MEC	Minimum Explosible Concentration
NFPA	National Fire Protection Association
NLP	No-Longer Polymer

abbreviation	Descriptions of the abbreviations used
NOEV	No Qbserved Effect Concentration
NOEL	No observed effect level
SIDS	Organization for Economic Co-operation and Development (OECD) Screening Information Dataset (SIDS)
PBT	Persistent, Bioaccumulative and Toxic
PEC	Predicted Effect Concentration
pKa, pKs	Negative logarithm of acid constant
PNEC	Predicted No Effect Concentration
PubChem	Database (U.S. National Library of Medicine, National Institutes of Health)
QSAR, ecosar	Quantitative Structure Activity Relationship, Software: ecosar (U.S., EPA)
QSAR, EPI	Quantitative Structure Activity Relationship, Software: EPIWIN U.S. EPA)
OSAR, TEST	Quantitative Structure Activity Relationship, Software: T.E.S.T (U.S. EPA)
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals
RID	Règlement concernant le transport International ferroviaire des marchandises Dangereuses
SIDS	Screening Information Data Set
SMW	work shift average value (Schichtmittelwert)
TSCA	Toxic Substances Control Act (U.S. EPA)
TOXNET	Toxicology Data Network (U.S. National Library of Medicine)
TRGS	Technical rules for hazardous substances (Germany): Technische Regeln für Gefahr-Stoffe (Deutschland)
TRGS 900	Occupational Exposure Limits (TRGS 900)
UVCB	Substances of Unknown or Variable composition, Complex reaction products or Biological materials
vPvB	very Persistent and very Bioaccumulative
VOC	Volatile Organic Compounds

List of relevant phrases (code and full text as stated in chapter 2 and 3)

Hazard statements (GHS, CLP) (Not necessary if the content < 125 ml [1.5.2 Annex I CLP])

Code	Phrase
H225	Highly flammable liquid and vapour
H226	Flammable liquid and vapour
H302	Harmful if swallowed or in contact with skin
H315	Causes skin irritation
H319	Causes serious eye irritation
H336	May cause drowsiness or dizziness
H373	May cause damage to organs through prolonged or repeated exposure

Precautionary statements (GHS, CLP) (Not necessary if the content < 125 ml [1.5.2 Annex I CLP])

Code	Phrase
P210	Keep away from heat, hot surfaces, sparks, open flames, and other ignition sources. No smoking.
P233	Keep container tightly closed.
P240	Ground/bond container and receiving equipment.
P280	Wear protective gloves/protective clothing.
P301+P312+P330	IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell. Rinse mouth.
P302+P352+P312	IF ON SKIN: Wash with plenty of soap and water. Call a POISON CENTER or doctor if you feel unwell.
P305+P338+P351	IF IN EYES: Remove contact lenses if present and easy to do. Continue rinsing, Rinse cautiously with water for several minutes.
P403+P235	Store in a well-ventilated place. Keep cool.

Key literature references and sources for data

- ECHA, Guidance on labelling and packaging in accordance with Regulation (EC) No 1272/2008

- EMBL-EBI, ChEMBL, https://www.ebi.ac.uk/chembl/
- EU, Scientific Committee on Consumer Safety (SCCS), SCCS/1439/11
- European Chemicals Agency (ECHA), https://echa.europa.eu/de/information-on-chemicals
- EU (European Commission), Cosmetic ingredient database (CosIng)
- GESTIS Substance Database, Information system on hazardous substances of the German Social Accident Insurance
- National Institutes of Health (NIH), National Library of Medicine, TOXNET, ChemIDplus
- SIDS, 2-Butanone, SIDS Dossier and SIAR for MEK, Appendix A, Draft
- SIDS, 2-Propanol, SIDS Initial Assessment Profile, UNEP Publications,
- SIDS, Ethanol, SIDS Initial Assessment Report, For SIAM 19, Berlin, Germany, 19 – 22 October 2004
- SIDS, Indigo Blue, SIDS Initial Assessment Report, For SIAM 2, Paris, France, 4-6 July 1994
- U.S. Office of Environment, Health, Safety & Security, Protective Action Criteria (PAC) with AEGLs, ERPGs, & TEELs: Rev. 29 for Chemicals of Concern
- U.S. EPA, Chemicals under the Toxic Substances Control Act (TSCA)
- U.S. National Library of Medicine, National Institutes of Health (NIH), Health & Human Services, TOXNET
- U.S. National Library of Medicine, National Institutes of Health (NIH), Health & Human Services, PubChem
- U.S. Office of Environment, Health, Safety & Security, (PAC-values)
- Regulation (EC) Nr. 1272/2008 (CLP, EU-GHS)
- Regulation (EC) Nr. 1907/2006 (REACH), updated 2015/830/EU

Disclaimer

To the best of our knowledge, the information in this safety data sheet is correct at the time of printing. The information is intended to give you guidelines for the safe handling of the product mentioned in this safety data sheet during storage, processing, transport and disposal. The information is not transferable to other products. Insofar as the product is mixed, blended or processed with other materials, or subjected to processing other than that intended, the information in this Safety Data Sheet cannot be transferred to the new material produced in this way, unless expressly stated otherwise.

[1] ECHA: "As up to 1% aniline can be contained in the Indigo registered, the substance has to be classified for this possible aniline content despite the fact that no adverse effects were noted up to the highest dose levels tested with Indigo containing up to 3% aniline and methylaniline as a sum, or Indigo with aniline and methylaniline each below 1%." The e-indigo used here is micronized, purified, and contains only traces of aniline and methylaniline (< 0.1%) and traces of indirubine, isoindigo (<1%).
GESTIS advice: "Pure indigo has not to be classified. Classification is based on an aniline content of 0.2% <= C < 1%. This aniline content cannot be avoided due to the synthesis. However, this amount of aniline is encased in the indigo particles and not freely available. They are released from the indigo particles if the indigo powder/granulate is vatted."
[2] EU class H066 for anisole (repeated exposure may cause skin dryness or cracking) is not a classification and therefore no risk assessment is required.