

# safety data sheet

according to Regulation (EC) No. 1907/2006 (REACH), amended by 2015/830/EU



article: **Isantin**

**Version 1.4en**

Date of compilation: 28.10.20

date of revision: 27.01.2022

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

### 1 Product identifier of the product Isantin (mixture as dispersion)

**Product codes: Isantin B, Isantin W**

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

Substance name	CAS-number	weight %	conz. limit	density g/cm <sup>3</sup> (20°C)	EG-number	IUPAC name
E-Indigo (>98.5%) (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	> 30	≥ 30 %, H319	0.79	200-578-6	ethanol
Anisole Methoxybenzene	100-66-3	≥ 1	< 50 %	0.994	202-876-1	anisole
1-Hexanol Hexan-1-ol n-Hexanol	111-27-3	≥ 1	< 50 %	0.815	203-852-3	hexan-1-ol
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

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

**Identified uses:** Gliding layer for winter sport equipment (coating)

**Uses advised against:** Not for food, drug, pesticide, biocidal product, or cosmetic use

**Life cycle stage [SU]:** SU21 – Consumer uses

**Chemical Products Categories [PC]:** PC31 - Polishes and wax blends

**Environmental Release Categories [ERC]:** ERC8a - 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).

**1.2 Relevant identified uses of the substance or mixture and uses advised against.** None known

### 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](mailto: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	<a href="http://www.toxinfo.med.tum.de/inhalt/giftnotrufmuenchen">http://www.toxinfo.med.tum.de/inhalt/giftnotrufmuenchen</a>
	Austria (Poison Center) Vergiftungsinformationszentrale	Stubenring 6	A-1010 Vienna	+43 1 406 43 43	<a href="https://goeg.at">https://goeg.at</a>
	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	<a href="mailto:Info@toxinfo.ch">Info@toxinfo.ch</a>

## 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 <sup>1</sup> (C.I. 73000)	482-89-3 207-586-9	-	ECHA	Aniline <0.1%	<i>purified 99%</i> <i>no H-code</i>	-	<i>purified 99%</i> <i>no Label</i>	<i>purified 99%</i> <i>no P-code</i>
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
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 Acute.tox. 4 Eye Irrit. 2	H226, H302, H312, H319	Warning	  C≥ 1%	P210, P280, P301+P312+ P330, P302+P352+ P312, P305+P351+ P338
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

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	

NFPA health rating 1; NFPA fire rating 3; NFPA reactivity rating 0; NFPA special instruction -

### 2.2 Other hazards


Since the substances are flammable, avoid the formation of deposits and dust and vapor in the air. Avoid clouds of dust and vapor in a closed or unventilated room, as dust and vapor 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) n°1907/2006 (point 3), the product contains:

 Mixture Substance name	CAS-number	Weight percent	Physical state	Colour	Odor	Molecular formula	Molar mass g/mol	pKa
E-Indigo (C.I.73000) (>98.5%)	482-89-3 68651-46-7	≥ 3	solid	dark blue	dull, musty	C <sub>16</sub> H <sub>10</sub> N <sub>2</sub> O <sub>2</sub>	262.26	pKa <sub>1</sub> : 8.0 pKa <sub>2</sub> : 12.7
Ethanol	64-17-5	≥ 10 – ≤ 98	liquid	colourless	spirituous	C <sub>2</sub> H <sub>6</sub> O	46.07	15.7
Anisole	100-66-3	< 50	liquid	colourless	anis-like spicy-sweet	C <sub>7</sub> H <sub>8</sub> O	108.14	-
1-Hexanol	111-27-3	< 50	liquid	colourless	sweetish	C <sub>6</sub> H <sub>14</sub> O	102.18	15.38
2-Butanone	78-93-3	≤ 2	liquid	colourless	acetone-like	C <sub>4</sub> H <sub>8</sub> O	72.11	-
2-Propanol Isopropanol	67-63-0	≤ 2	liquid	colourless	alcohol-like	C <sub>3</sub> H <sub>8</sub> O	60.10	17.1
other mixture components	3734-33-6	< 0.1 resp. <0.0012	solid	colourless	odourless	C <sub>21</sub> H <sub>29</sub> N <sub>2</sub> O · C <sub>7</sub> H <sub>5</sub> O	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 administer 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<sub>2</sub>)


#### 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)** for planning and response to uncontrolled releases of hazardous chemicals

	country	name of agent	CAS-Nr.	Units	PAC-1	PAC-2	PAC-3	source
	US	Indigo, dust	482-89-3	mg/m <sup>3</sup>	-	100 (estimate)	-	U.S. DOE
	US	Ethanol	64-17-5	ppm	1800	3300	15'000	U.S. DOE
	US	Anisole	100-66-3	mg/m <sup>3</sup>	1.6	18	110	U.S. DOE
	US	1-Hexanol	111-27-3	ppm	10	110	580	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

#### Hazardous combustion products

In case of fire may be liberated: carbon monoxide (CO), carbon dioxide (CO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), 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

#### Advice 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 exhaust 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: 5 – 25 °C.

### 7.3 Specific end use(s)

Usually used as dye, rarely as semiconductor or as lubricant.




**SECTION 8: Exposure controls/personal protection**

**8.1 Control parameters**

**National limit values**

**Occupational exposure limit values (Workplace Exposure Limits, WEL)**

	country	name of agent	CAS-Nr.	note	identifier	TWA [mg/m <sup>3</sup> ]	STEL [mg/m <sup>3</sup> ]	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
	GB	Indigo, dust	482-89-3	i	WEL	10		EH40/2005
	GB	Indigo, dust	482-89-3	r	WEL	4		EH40/2005
	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	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
	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

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.

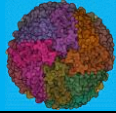
# safety data sheet

according to (EC) Nr. 1907/2006 (REACH), amended by 2015/830/EU




article: **Isantin**

## 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 (derived no-effect level (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	482-89-3	DNEL	10 mg/m <sup>3</sup>	human, inhalative dust	workers (industry)	acute - systemic effects
Indigo	482-89-3	DNEL	3 mg/m <sup>3</sup>	human, respirative dust	workers (industry)	acute - systemic effects
Indigo	482-89-3	DNEL	212 mg/m <sup>3</sup>	human, inhalative dust	DUGV	systemic effects
Ethanol	64-17-5	DNEL	1.900 mg/m <sup>3</sup>	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/m <sup>3</sup>	human, inhalative	workers (industry)	chronic - systemic effects
Ethanol	64-17-5	DNEL	950 mg/m <sup>3</sup>	human, inhalative	DUGV	systemic effects
Anisole <sup>2</sup>	100-66-3	DNEL	3 000 mg/m <sup>3</sup>	human, inhalative	workers (industry)	subacute to chronic systemic effects
Anisole	100-66-3	DNEL	20 mg/m <sup>3</sup>	human, inhalative	workers (industry)	chronic - systemic effects
1-Hexanol	111-27-3	DNEL	99 mg/m <sup>3</sup>	human, inhalative	workers (industry)	chronic - systemic effects)
1-Hexanol	111-27-3	DNEL	210 mg/m <sup>3</sup>	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/cm <sup>2</sup>	human, dermal	workers (industry)	chronic - local effects
1-Hexanol	111-27-3	DNEL	100	human, inhalative	DUGV	local effects
1-Hexanol	111-27-3	DNEL	100	human, inhalative	DUGV	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/m <sup>3</sup>	human, inhalative	workers (industry)	chronic - systemic effects
2-Butanone	78-93-3	DNEL	600 mg/m <sup>3</sup>	600 mg/m <sup>3</sup>	DUGV	systemic effects
2-Propanol	67-63-0	DNEL	500 mg/m <sup>3</sup>	human, inhalative	workers (industry)	chronic - systemic effects
2-Propanol	67-63-0	DNEL	888 mg/kg/day	human, dermal	workers (industry)	chronic - systemic effects
2-Propanol	67-63-0	DNEL	500 mg/m <sup>3</sup>	human, inhalative	DUGV	systemic effects



# safety data sheet

according to (EC) Nr. 1907/2006 (REACH), amended by 2015/830/EU



article: **Isantin**

**environmental values** (note: the solubility of indigo in water:  $\sim 0.001 \text{ mg/cm}^3$ )

	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 <sup>3</sup>	freshwater	continuous
	Indigo	482-89-3	PNEC	0.01 mg/L	freshwater, aquatic organisms	
	Indigo	482-89-3	PNEC	0.01 mg/L	marine water, aquatic organisms	short-term (single instance)
	Indigo	482-89-3	PNEC	0.74 mg/kg	freshwater sediment, aquatic organisms	short-term (single instance)
	Indigo	482-89-3	PNEC	0.74 mg/kg	marine water sediment, aquatic organisms	short-term (single instance)
	Indigo	482-89-3	PNEC	0.14 mg/kg	soil, terrestrial organisms	short-term (single instance)
	Ethanol	64-17-5	PNEC	0.79 mg/cm <sup>3</sup>	marine water	continuous
	Ethanol	64-17-5	PNEC	2.75 mg/cm <sup>3</sup>	air	continuous
	Ethanol	64-17-5	PNEC	3.6 mg/cm <sup>3</sup>	freshwater sediment	continuous
	Ethanol	64-17-5	PNEC	0.96 mg/cm <sup>3</sup>	freshwater	continuous
	Ethanol	64-17-5	PNEC	580 mg/cm <sup>3</sup>	sewage treatment plant (STP)	continuous
	Ethanol	64-17-5	PNEC	0.63 mg/cm <sup>3</sup>	soil	continuous
	Anisole	100-66-3	PNEC	27 µg/l	freshwater	short-term (single instance)
	Anisole	100-66-3	PNEC	2.7 µg/l	marine water	short-term (single instance)
	Anisole	100-66-3	PNEC	30 mg/L	marine water sediment	short-term (single instance)
	Anisole	100-66-3	PNEC	0.745 mg/kg	freshwater sediment	short-term (single instance)
	Anisole	100-66-3	PNEC	0.074 mg/kg	marine water sediment	short-term (single instance)
	Anisole	100-66-3	PNEC	0.133 mg/kg	soil	short-term (single instance)
	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
	2-Butanone	78-93-3	PNEC	55.8 mg/cm <sup>3</sup>	marine water	continuous
	2-Butanone	78-93-3	PNEC	55.8 mg/cm <sup>3</sup>	air	continuous
	2-Butanone	78-93-3	PNEC	285 mg/cm <sup>3</sup>	freshwater sediment	continuous
	2-Butanone	78-93-3	PNEC	55.8 mg/cm <sup>3</sup>	freshwater	continuous
	2-Butanone	78-93-3	PNEC	709 mg/cm <sup>3</sup>	sewage treatment plant (STP)	continuous
	2-Butanone	78-93-3	PNEC	22.5 mg/cm <sup>3</sup>	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



## safety data sheet

according to (EC) Nr. 1907/2006 (REACH), amended by 2015/830/EU



article: **Isantin**

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### 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 liquid dispersion)**



**Appearance**

Physical state  
 Colour  
 Odour  
 Odour threshold

**Other physical and chemical characteristics of solids**

pH-value  
 Melting point/freezing point  
 Boiling start and boiling range  
 Flash point  
 Evaporation rate  
 Flammability (solid, gaseous)

Explosion limits

- lower explosion limit (LEL)
  - upper explosion limit (UEL)
- Explosion limits of dust/air mixtures

Vapour pressure  
 Density  
 Vapour density  
 Relative Density, vapour/air-mixture (air=1)  
Solubilities: Water solubility  
Partition coefficient: n-octanol/water (log Kow)  
 Auto-ignition temperature  
 Decomposition temperature  
 Viscosity  
 Explosive properties  
 Oxidising properties

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

**Characteristics**

solid/liquid (dispersion)  
 dark blue, copper lustre  
 some acetone similar, dull/musty  
 no data available for pure Indigo

7.5 - 9 (20 °C)  
 approx. 390-392 °C (sublimation approx. 170 °C)  
 first sublimation, then decomposition  
 > 220 °C  
 no data available  
 > 350 °C (Auto-ignition temperature)

ca. 200 g/m<sup>3</sup> (dust) = minimum explosible concentration (MEC)  
 no data available  
 dust explosion of over 200 g/m<sup>3</sup> was observed. The minimum ignition energy is between 320 and 650 mJ with a particle size up to 330 µm  
 < 3.5x10<sup>-5</sup> Pa at 100°C  
 approx.1.35 g/cm<sup>3</sup>at 20 °C (PubChem) bis 1.50 (cryst.)  
 No data available.  
 No information is available on this property  
 0.99 mg/L (25 °C, SIDS), 0.05 mg/L (ECHA)  
 2.7 (23 °C, SIDS); 3.72 (TOXNET)  
 No information is available on this property  
 >= 400 °C (E-indigo)  
 Not relevant (solid)  
 dust  
 none

**Other physical and chemical parameters: Dispersing agent (liquid)**

**Appearance**

Physical state  
 Colour  
 Odour  
 Odour threshold

pH-Wert  
 Melting point/freezing point  
 Boiling start and boiling range  
 Flash point

Evaporation rate  
 Flammability (solid, gaseous)  
Explosion limits (mixture)  
 • lower explosion limit (LEL)  
 • upper explosion limit (UEL)

**Characteristics**

liquid  
 colourless  
 anise-like, spicy-sweet, spritty, similar to acetones, dull/musty  
 Ethanol (95%): 0.52; 2-Propanol: 40; Anisole: 0.057; 1-Hexanol : 0.006 [ppm]; no data for Indigo  
 7 (water: 10 g/l 20 °C), pKa: 16 (Ethanol)  
 ca. -114 °C/78 °C  
 79-153 °C  
 Ethanol (95%): 3.8; 2-Propanol: 1.7; Anisole: 0.1; 1-Hexanol: 0.05 [n-BuAc=1]  
 8.3-20 (start → end)  
 > 350 °C (Auto-ignition temperature)

3.1 Vol-% (estimated)  
 27.7 Vol-% (estimated)

## safety data sheet

according to (EC) Nr. 1907/2006 (REACH), amended by 2015/830/EU



article: **Isantin**

Vapour pressure	58.0 hPa 20 °C
Density	Indigo: 1.35; Ethanol (95%): 0.7893 (20°C); 2-Propanol: 0.785 (25°C); Anisole: 0.9956 (18°C); 1-Hexanol: 0.8153 (25°C) [g/cm <sup>3</sup> ]
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/cm <sup>3</sup> at 20 °C
<u>Solubility(ies)</u> : Water solubility (20°C) [mg/L]	Anisole: 1710, Ethanol: completely miscible, 2-Propanol: completely miscible, 2-Butanone: 210'000, 1-Hexanol: 5'900
<u>Partition coefficient</u> : 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.

### 9.2 Additional data

Physical, chemical, biological and ecological data of isomers and tautomers of indigo were estimated using QSAR and are available open access on Zenodo. <https://doi.org/10.5281/zenodo.5779028>.

## 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. P<sub>2</sub>O<sub>5</sub>), 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 of agent	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.

#### Toxicological effects

name of agent	exposure route	endpoint	value	species	source
Indigo <sup>a</sup>	oral	LD <sub>50</sub>	> 3160 mg/kg	rat	ECHA
Indigo	oral	LD <sub>50</sub>	> 5000 mg/kg	rat	SIDS
Indigo	oral	LD <sub>50</sub>	> 6400 mg/kg	rat	ECHA
Indigo	oral	LD <sub>50</sub>	>32 gm/kg	mouse	NIOSH
Indigo	inhalative: dust	LC <sub>50</sub>	0.08 mg/L/4hr	rat	SIDS
Indigo	dermal	LD <sub>50</sub>	2000 kg	rat	SIDS
Indigo	dermal	LD <sub>50</sub>	> 2500 mg/kg bw	rat	ECHA
Indigo	intraperitoneal	LD <sub>50</sub>	~ 8000 mg/kg bw	mouse	ECHA
Indigo	intraperitoneal	LD <sub>50</sub>	2200 mg/kg	mouse	NIOSH
Indigo	oral	LC <sub>50</sub>	5.3 mg/L (4h)	rat	SIDS
Indigo	oral	LC <sub>50</sub>	> 2000 mg/kg	rabbit	SIDS
Indigo	oral	NOEL	1,200 mg/kg/day: repeated dose toxicity	rat	SIDS
Indigo	oral	NOEL	500 mg/kg/day:reprod. toxicity, offspring	rat	SIDS
Indigo	oral	NOEL	500 mg/kg/day: Teratogenicity	rat	SIDS
Indigo	oral	NOEL	500 mg/kg/day: parenteral	rat	SIDS
Indigo	oral	EDLC	12 mg/kg/day: repeated dose	human	SIDS
Indigo	oral	EDLC	5 mg/kg/day:reproductive toxicity	human	SIDS
Ethanol	oral	LD <sub>50</sub>	10470 mg/kg	rat	OECD-401
Ethanol	oral	LD <sub>50</sub>	15010 mg/kg	rat	SIDS
Ethanol	oral	LD <sub>50</sub>	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 <sup>b</sup>	LC <sub>50</sub>	125 mg/L/4H	rat	OECD-403
Ethanol	inhalative	LC <sub>50</sub>	> 60'000 ppm	mice	SIDS
Ethanol	inhalative	conc.	5000 ppm (irritating and uncomfortable to breathe but tolerable)	human	SIDS
Ethanol	dermal	LDL <sub>0</sub>	> 20,000 mg/kg	rabbit	SIDS
Ethanol	intraperitoneal	LD <sub>50</sub>	9710 mg/kg (male)	mouse	SIDS
Ethanol	intraperitoneal	LD <sub>50</sub>	9450 mg/kg (female)	mouse	SIDS
Ethanol	eye	severe	500 mg	rabbit	NIOSH
Ethanol	eye	mild	500 mg/24H	rabbit	NIOSH
Ethanol	eye	moderate	100 mg/4S rinse	rabbit	NIOSH
Ethanol	eye	moderate	100 µL	rabbit	NIOSH
Ethanol	oral	TDLo	320 mg/kg/50W- intermittent	mouse	NIOSH
Ethanol	oral	LD	400 gm/kg/57W- intermittent	mouse	NIOSH
Ethanol	oral	TDLo	6000 mg/kg	cat	NIOSH

# safety data sheet

according to (EC) Nr. 1907/2006 (REACH), amended by 2015/830/EU



article: **Isantin**

name of agent	exposure route	endpoint	value	species	source
Ethanol	oral	TDLo	6 gm/kg	cat	NIOSH
Ethanol	oral	TDLo	2 gm/kg	child	NIOSH
Ethanol	oral	TDLo	14400 mg/kg/30M- intermittent	child	NIOSH
Ethanol	oral	TDLo	2 gm/kg	Dog	NIOSH
Ethanol	oral	TDLo	5500 mg/kg	Dog	NIOSH
Ethanol	oral	LD <sub>50</sub>	5560 mg/kg	guinea pig	NIOSH
Ethanol	oral	TDLo	600 mg/kg	human	NIOSH
Ethanol	oral	TDLo	0.1 gm/kg	human	NIOSH
Ethanol	oral	TDLo	0.5 mg/kg	human	NIOSH
Ethanol	oral	TDLo	0.7 gm/kg/10M	human	NIOSH
Ethanol	oral	TDLo	400 mg/kg	human	NIOSH
Ethanol	oral	TDLo	0.5 gm/kg	human	NIOSH
Ethanol	oral	TDLo	1.4 gm/kg	human	NIOSH
Ethanol	oral	TDLo	1400 mg/kg	human	NIOSH
Ethanol	oral	TDLo	11712 µL/kg	infant	NIOSH
Ethanol	oral	TDLo	625 mg/kg	man	NIOSH
Ethanol	oral	TDLo	0.8 gm/kg	man	NIOSH
Ethanol	oral	TDLo	0.5 gm/kg	man	NIOSH
Ethanol	oral	TDLo	1.14 mL/kg	man	NIOSH
Ethanol	oral	TDLo	0.8 gm/kg	man	NIOSH
Ethanol	oral	TDLo	0.6 gm/kg	man	NIOSH
Ethanol	oral	TDLo	22500 mg/kg/4W- intermittent	man	NIOSH
Ethanol	oral	TDLo	3371 µL/kg	man	NIOSH
Ethanol	oral	TDLo	50 mg/kg	man	NIOSH
Ethanol	oral	TDLo	1430 µg/kg	man	NIOSH
Ethanol	oral	TDLo	650 mg/kg	man	NIOSH
Ethanol	oral	TDLo	0.45 gm/kg	man	NIOSH
Ethanol	oral	TDLo	4.8 mg/kg	monkey	NIOSH
Ethanol	oral	TDLo	102 mg/kg	monkey	NIOSH
Ethanol	oral	TDLo	5000 mg/kg	mouse	NIOSH
Ethanol	oral	TDLo	6000 mg/kg	mouse	NIOSH
Ethanol	oral	TDLo	1.5 mg/kg	mouse	NIOSH
Ethanol	oral	TDLo	1000 mg/kg	mouse	NIOSH
Ethanol	oral	TDLo	5000 mg/kg	mouse	NIOSH
Ethanol	oral	TDLo	6000 mg/kg	mouse	NIOSH
Ethanol	oral	TDLo	1 gm/kg	mouse	NIOSH
Ethanol	oral	TDLo	6 gm/kg	mouse	NIOSH
Ethanol	oral	TDLo	5 gm/kg	mouse	NIOSH
Ethanol	oral	TDLo	4 gm/kg	mouse	NIOSH
Ethanol	oral	TDLo	5 gm/kg	mouse	NIOSH
Ethanol	oral	LD <sub>50</sub>	3450 mg/kg	mouse	NIOSH
Ethanol	oral	TDLo	500 mg/kg	mouse	NIOSH
Ethanol	oral	TDLo	6.45 mL/kg	mouse	NIOSH
Ethanol	oral	TDLo	4.8 gm/kg	mouse	NIOSH
Ethanol	oral	TDLo	3 gm/kg	mouse	NIOSH
Ethanol	oral	TDLo	4 gm/kg	mouse	NIOSH
Ethanol	oral	TDLo	3.08 mL/kg	mouse	NIOSH
Ethanol	oral	LD <sub>50</sub>	10.5 mL/kg	mouse	NIOSH
Ethanol	oral	TDLo	6000 mg/kg	mouse	NIOSH
Ethanol	oral	TDLo	3 mL/kg	mouse	NIOSH
Ethanol	oral	TDLo	4000 mg/kg	mouse	NIOSH
Ethanol	oral	TDLo	5 gm/kg	mouse	NIOSH
Ethanol	oral	TDLo	5 gm/kg	mouse	NIOSH

# safety data sheet

according to (EC) Nr. 1907/2006 (REACH), amended by 2015/830/EU



article: **Isantin**

name of agent	exposure route	endpoint	value	species	source
Ethanol	oral	TDLo	8 gm/kg	mouse	NIOSH
Ethanol	oral	TDLo	5 gm/kg	mouse	NIOSH
Ethanol	oral	TDLo	4444 µL/kg	mouse	NIOSH
Ethanol	oral	TDLo	1111 µL/kg	mouse	NIOSH
Ethanol	oral	TDLo	16 mL/kg	mouse	NIOSH
Ethanol	oral	TDLo	5 gm/kg	mouse	NIOSH
Ethanol	oral	TDLo	2.5 gm/kg	mouse	NIOSH
Ethanol	oral	TDLo	1 gm/kg	pigeon	NIOSH
Ethanol	oral	LD <sub>50</sub>	6300 mg/kg	rabbit	NIOSH
Ethanol	oral	TDLo	1 gm/kg	rat	NIOSH
Ethanol	oral	TDLo	3.9 gm/kg	rat	NIOSH
Ethanol	oral	TDLo	4.8 mL/kg	rat	NIOSH
Ethanol	oral	TDLo	4.57 mL/kg	rat	NIOSH
Ethanol	oral	TDLo	1000 mg/kg	rat	NIOSH
Ethanol	oral	TDLo	4.44 mL/kg	rat	NIOSH
Ethanol	oral	TDLo	2 gm/kg	rat	NIOSH
Ethanol	oral	TDLo	12800 mg/kg	rat	NIOSH
Ethanol	oral	LD <sub>50</sub>	15010 mg/kg	rat	NIOSH
Ethanol	oral	TDLo	7000 mg/kg	rat	NIOSH
Ethanol	oral	TDLo	0.4 gm/kg	rat	NIOSH
Ethanol	oral	TDLo	2 gm/kg	rat	NIOSH
Ethanol	oral	TDLo	6 gm/kg	rat	NIOSH
Ethanol	oral	TDLo	2.375 mL/kg	rat	NIOSH
Ethanol	oral	TDLo	5 mL/kg	rat	NIOSH
Ethanol	oral	TDLo	1600 mg/kg	rat	NIOSH
Ethanol	oral	TDLo	10 mL/kg	rat	NIOSH
Ethanol	oral	TDLo	5.25 gm/kg	rat	NIOSH
Ethanol	oral	TDLo	8000 mg/kg	rat	NIOSH
Ethanol	oral	TDLo	3 gm/kg	rat	NIOSH
Ethanol	oral	TDLo	5 gm/kg	rat	NIOSH
Ethanol	oral	TDLo	4800 mg/kg	rat	NIOSH
Ethanol	oral	TDLo	6000 mg/kg	rat	NIOSH
Ethanol	oral	TDLo	1500 mg/kg	rat	NIOSH
Ethanol	oral	LD <sub>50</sub>	7060 mg/kg	rat	NIOSH
Ethanol	oral	TDLo	6.4 gm/kg	rat	NIOSH
Ethanol	oral	TDLo	5000 mg/kg	rat	NIOSH
Ethanol	oral	TDLo	3 gm/kg	rat	NIOSH
Ethanol	oral	TDLo	5000 mg/kg	rat	NIOSH
Ethanol	oral	LD <sub>50</sub>	7 gm/kg	rat	NIOSH
Ethanol	oral	TDLo	5250 mg/kg	rat	NIOSH
Ethanol	oral	TDLo	0.5 gm/kg	rat	NIOSH
Ethanol	oral	TDLo	5000 mg/kg	rat	NIOSH
Ethanol	oral	TDLo	6000 mg/kg	rat	NIOSH
Ethanol	oral	TDLo	6 gm/kg	rat	NIOSH
Ethanol	oral	TDLo	4 mL/kg	rat	NIOSH
Ethanol	oral	TDLo	10 mL/kg	rat	NIOSH
Ethanol	oral	TDLo	4300 mg/kg	rat	NIOSH
Ethanol	oral	TDLo	6000 mg/kg	rat	NIOSH
Ethanol	oral	TDLo	1500 mg/kg	rat	NIOSH
Ethanol	oral	TDLo	5 gm/kg	rat	NIOSH
Ethanol	oral	TDLo	0.72 gm/kg	rat	NIOSH
Ethanol	oral	TDLo	10.5 gm/kg/2H	rat	NIOSH
Ethanol	oral	TDLo	7.5 mL/kg	rat	NIOSH

# safety data sheet

according to (EC) Nr. 1907/2006 (REACH), amended by 2015/830/EU



article: **Isantin**

name of agent	exposure route	endpoint	value	species	source
Ethanol	oral	TDLo	4.75 mL/kg	rat	NIOSH
Ethanol	oral	TDLo	5.3 mL/kg	rat	NIOSH
Ethanol	oral	TDLo	5 mL/kg	rat	NIOSH
Ethanol	oral	TDLo	1 gm/kg	rat	NIOSH
Ethanol	oral	TDLo	5 mL/kg	rat	NIOSH
Ethanol	oral	TDLo	0.4736 gm/kg	rat	NIOSH
Ethanol	oral	TDLo	256 gm/kg/12W	woman	NIOSH
Ethanol	oral	TDLo	1200 mg/kg/3H	woman	NIOSH
Ethanol	oral	TDLo	0.7 gm/kg	woman	NIOSH
Ethanol	oral	TDLo	560 mL/kg/10W- continuous	Dog	NIOSH
Ethanol	oral	TDLo	204 gm/kg/68D- continuous	guinea pig	NIOSH
Ethanol	oral	TDLo	180 gm/kg/45D- intermittent	guinea pig	NIOSH
Ethanol	oral	TDLo	512 mg/kg/30D- continuous	hamster	NIOSH
Ethanol	oral	TDLo	559 mg/kg/30D- continuous	hamster	NIOSH
Ethanol	oral	TDLo	149 units/kg/4Y- intermittent	human	NIOSH
Ethanol	oral	TDLo	4623 gm/kg/12Y- intermittent	man	NIOSH
Ethanol	oral	TDLo	210 gm/kg/5W- intermittent	monkey	NIOSH
Ethanol	oral	TDLo	260 gm/kg/2Y- intermittent	monkey	NIOSH
Ethanol	oral	TDLo	32.5 gm/kg/90D- intermittent	monkey	NIOSH
Ethanol	oral	TDLo	13500 gm/kg/72W- intermittent	monkey	NIOSH
Ethanol	oral	TDLo	657000 mg/kg/90D- intermittent	mouse	NIOSH
Ethanol	oral	TDLo	25200 mg/kg/7D- intermittent	mouse	NIOSH
Ethanol	oral	TDLo	284.4 gm/kg/45D- intermittent	mouse	NIOSH
Ethanol	oral	TDLo	1344 gm/kg/8W- intermittent	mouse	NIOSH
Ethanol	oral	TDLo	84 gm/kg/5W- continuous	mouse	NIOSH
Ethanol	oral	TDLo	84 gm/kg/5W- continuous	mouse	NIOSH
Ethanol	oral	TDLo	470220 mg/kg/51D- continuous	mouse	NIOSH
Ethanol	oral	TDLo	284.4 gm/kg/45D- intermittent	mouse	NIOSH
Ethanol	oral	TDLo	72 mL/kg/4W- intermittent	mouse	NIOSH
Ethanol	oral	TDLo	284.4 gm/kg/45D- intermittent	mouse	NIOSH
Ethanol	oral	TDLo	95200 mg/kg/4W- intermittent	mouse	NIOSH
Ethanol	oral	TDLo	78400 mg/kg/4W- intermittent	mouse	NIOSH
Ethanol	oral	TDLo	496000 mg/kg/80W- intermittent	mouse	NIOSH
Ethanol	oral	TDLo	2920000 mg/kg/2Y- intermittent	mouse	NIOSH
Ethanol	oral	TDLo	5256000 mg/kg/2Y- intermittent	mouse	NIOSH
Ethanol	oral	TDLo	35 gm/kg/5W- intermittent	mouse	NIOSH
Ethanol	oral	TDLo	15000 mg/kg/2D- intermittent	mouse	NIOSH
Ethanol	oral	TDLo	24000 mL/kg/120D- continuous	mouse	NIOSH
Ethanol	oral	TDLo	36000 mL/kg/180D- continuous	mouse	NIOSH
Ethanol	oral	TDLo	36000 mL/kg/180D- continuous	mouse	NIOSH
Ethanol	oral	TDLo	3500 gm/kg/10W- continuous	mouse	NIOSH
Ethanol	oral	TDLo	2100 gm/kg/5W- continuous	mouse	NIOSH
Ethanol	oral	TDLo	1750 gm/kg/5W- continuous	mouse	NIOSH
Ethanol	oral	TDLo	448 gm/kg/4W- continuous	mouse	NIOSH
Ethanol	oral	TDLo	1120 gm/kg/4W- intermittent	mouse	NIOSH
Ethanol	oral	TDLo	98800 mg/kg/13D- continuous	mouse	NIOSH
Ethanol	oral	TDLo	480000 mg/kg/60D- continuous	mouse	NIOSH
Ethanol	oral	TDLo	396 gm/kg/198D- continuous	mouse	NIOSH
Ethanol	oral	TDLo	396 gm/kg/198D- continuous	mouse	NIOSH
Ethanol	oral	TDLo	295.2 gm/kg/10W- intermittent	mouse	NIOSH
Ethanol	oral	TDLo	40 gm/kg/8D- intermittent	mouse	NIOSH
Ethanol	oral	TDLo	194 gm/kg/6W- continuous	mouse	NIOSH
Ethanol	oral	TDLo	298 gm/kg/8W- continuous	mouse	NIOSH



# safety data sheet

according to (EC) Nr. 1907/2006 (REACH), amended by 2015/830/EU



article: **Isantin**

name of agent	exposure route	endpoint	value	species	source
Ethanol	oral	TDLo	298 gm/kg/8W- continuous	mouse	NIOSH
Ethanol	oral	TDLo	2070 gm/kg/0.5Y- continuous	mouse	NIOSH
Ethanol	oral	TDLo	2070 gm/kg/0.5Y- continuous	mouse	NIOSH
Ethanol	oral	TDLo	672000 mg/kg/12W- continuous	mouse	NIOSH
Ethanol	oral	TDLo	1440 gm/kg/90D- intermittent	mouse	NIOSH
Ethanol	oral	TDLo	28000 mg/kg/7D- continuous	mouse	NIOSH
Ethanol	oral	TDLo	56000 mg/kg/7D- continuous	mouse	NIOSH
Ethanol	oral	TDLo	25200 mg/kg/7D- intermittent	mouse	NIOSH
Ethanol	oral	TDLo	16665 µL/kg/30D- intermittent	mouse	NIOSH
Ethanol	oral	TDLo	33330 µL/kg/30D- intermittent	mouse	NIOSH
Ethanol	oral	TDLo	15 gm/kg/2D- intermittent	mouse	NIOSH
Ethanol	oral	TDLo	15 gm/kg/2D- intermittent	mouse	NIOSH
Ethanol	oral	TDLo	18 gm/kg/24D- intermittent	mouse	NIOSH
Ethanol	oral	TDLo	1041.6 mL/kg/21D- continuous	mouse	NIOSH
Ethanol	oral	TDLo	1041.6 mL/kg/21D- continuous	mouse	NIOSH
Ethanol	oral	TDLo	20 gm/kg/2D- intermittent	mouse	NIOSH
Ethanol	oral	TDLo	12 gm/kg/2D- intermittent	mouse	NIOSH
Ethanol	oral	TDLo	54 gm/kg/9D- intermittent	mouse	NIOSH
Ethanol	oral	TDLo	3040 mL/kg/152D- continuous	mouse	NIOSH
Ethanol	oral	TDLo	1022.4 mL/kg/213D- continuous	mouse	NIOSH
Ethanol	oral	TDLo	1022.4 mL/kg/213D- continuous	mouse	NIOSH
Ethanol	oral	TDLo	585.6 mL/kg/122D- continuous	mouse	NIOSH
Ethanol	oral	TDLo	585.6 mL/kg/122D- continuous	mouse	NIOSH
Ethanol	oral	TDLo	480 gm/kg/12W- continuous	mouse	NIOSH
Ethanol	oral	TDLo	15 gm/kg/2D- intermittent	mouse	NIOSH
Ethanol	oral	TDLo	15 gm/kg/2D- intermittent	mouse	NIOSH
Ethanol	oral	TDLo	44 gm/kg/11D- intermittent	mouse	NIOSH
Ethanol	oral	TDLo	56 gm/kg/14D- intermittent	mouse	NIOSH
Ethanol	oral	TDLo	25 mL/kg/2D- intermittent	mouse	NIOSH
Ethanol	oral	TDLo	18 gm/kg/2D- intermittent	mouse	NIOSH
Ethanol	oral	TDLo	300 gm/kg/60D- intermittent	rat	NIOSH
Ethanol	oral	TDLo	1386 gm/kg/24W- intermittent	rat	NIOSH
Ethanol	oral	TDLo	168 gm/kg/4W- intermittent	rat	NIOSH
Ethanol	oral	TDLo	126 gm/kg/3W- intermittent	rat	NIOSH
Ethanol	oral	TDLo	112 gm/kg/4W- intermittent	rat	NIOSH
Ethanol	oral	TDLo	15 gm/kg/2D- intermittent	rat	NIOSH
Ethanol	oral	TDLo	369.6 gm/kg/28D- continuous	rat	NIOSH
Ethanol	oral	TDLo	114 gm/kg/4W- intermittent	rat	NIOSH
Ethanol	oral	TDLo	360 gm/kg/90D- intermittent	rat	NIOSH
Ethanol	oral	TDLo	217 gm/kg/4W- intermittent	rat	NIOSH
Ethanol	oral	TDLo	152 gm/kg/4W- intermittent	rat	NIOSH
Ethanol	oral	TDLo	68 gm/kg/2W- intermittent	rat	NIOSH
Ethanol	oral	TDLo	31.5 gm/kg/63D- intermittent	rat	NIOSH
Ethanol	oral	TDLo	1224 gm/kg/26W- continuous	rat	NIOSH
Ethanol	oral	TDLo	1.42 gm/kg/3D- intermittent	rat	NIOSH
Ethanol	oral	TDLo	106.56 mL/kg/28D- continuous	rat	NIOSH
Ethanol	oral	TDLo	16 gm/kg/5D- intermittent	rat	NIOSH
Ethanol	oral	TDLo	1386 mg/kg/24W- intermittent	rat	NIOSH
Ethanol	oral	TDLo	522 gm/kg/90D- intermittent	rat	NIOSH
Ethanol	oral	TDLo	360 gm/kg/90D- intermittent	rat	NIOSH
Ethanol	oral	TDLo	540000 mg/kg/45D- intermittent	rat	NIOSH
Ethanol	oral	TDLo	112000 mg/kg/4W- continuous	rat	NIOSH
Ethanol	oral	TDLo	963.2 gm/kg/16W- continuous	rat	NIOSH

# safety data sheet

according to (EC) Nr. 1907/2006 (REACH), amended by 2015/830/EU



article: **Isantin**

name of agent	exposure route	endpoint	value	species	source
Ethanol	oral	TDLo	300 gm/kg/12W- continuous	rat	NIOSH
Ethanol	oral	TDLo	336 gm/kg/12W- continuous	rat	NIOSH
Ethanol	oral	TDLo	56.25 gm/kg/90D- continuous	rat	NIOSH
Ethanol	oral	TDLo	175 mL/kg/10W- intermittent	rat	NIOSH
Ethanol	oral	TDLo	213.15 gm/kg/15D- continuous	rat	NIOSH
Ethanol	oral	TDLo	355.5 gm/kg/45D- intermittent	rat	NIOSH
Ethanol	oral	TDLo	300 gm/kg/60D- intermittent	rat	NIOSH
Ethanol	oral	TDLo	300 gm/kg/60D- intermittent	rat	NIOSH
Ethanol	oral	TDLo	1512 gm/kg/90D- intermittent	rat	NIOSH
Ethanol	oral	TDLo	96 gm/kg/16D- intermittent	rat	NIOSH
Ethanol	oral	TDLo	42 gm/kg/7D- intermittent	rat	NIOSH
Ethanol	oral	TDLo	355.5 gm/kg/9W- intermittent	rat	NIOSH
Ethanol	oral	TDLo	70 gm/kg/10W- intermittent	rat	NIOSH
Ethanol	oral	TDLo	355.5 gm/kg/45D- intermittent	rat	NIOSH
Ethanol	oral	TDLo	469 gm/kg/12W- intermittent	rat	NIOSH
Ethanol	oral	TDLo	168 gm/kg/12W- intermittent	rat	NIOSH
Ethanol	oral	TDLo	270 gm/kg/90D- intermittent	rat	NIOSH
Ethanol	oral	TDLo	54 gm/kg/9D- intermittent	rat	NIOSH
Ethanol	oral	TDLo	54 gm/kg/9D- intermittent	rat	NIOSH
Ethanol	oral	TDLo	273000 mg/kg/21D- continuous	rat	NIOSH
Ethanol	oral	TDLo	1428000 mg/kg/14D- continuous	rat	NIOSH
Ethanol	oral	TDLo	875 gm/kg/35D- continuous	rat	NIOSH
Ethanol	oral	TDLo	42 gm/kg/7D- intermittent	rat	NIOSH
Ethanol	oral	TDLo	25000 mg/kg/5D- intermittent	rat	NIOSH
Ethanol	oral	TDLo	420 gm/kg/10W- intermittent	rat	NIOSH
Ethanol	oral	TDLo	48000 mg/kg/12W- intermittent	rat	NIOSH
Ethanol	oral	TDLo	41.6 gm/kg/4D- continuous	rat	NIOSH
Ethanol	oral	TDLo	130 gm/kg/10D- continuous	rat	NIOSH
Ethanol	oral	TDLo	36000 mg/kg/6D- continuous	rat	NIOSH
Ethanol	oral	TDLo	8 gm/kg/10D- intermittent	rat	NIOSH
Ethanol	oral	TDLo	300 gm/kg/12W- intermittent	rat	NIOSH
Ethanol	oral	TDLo	27000 mg/kg/6D- intermittent	rat	NIOSH
Ethanol	oral	TDLo	31500 mg/kg/6D- intermittent	rat	NIOSH
Ethanol	oral	TDLo	108 gm/kg/4W- intermittent	rat	NIOSH
Ethanol	oral	TDLo	10400 mg/kg/13D- intermittent	rat	NIOSH
Ethanol	oral	TDLo	875 mg/kg/10W- intermittent	rat	NIOSH
Ethanol	oral	TDLo	21000 mg/kg/7D- intermittent	rat	NIOSH
Ethanol	oral	TDLo	15 gm/kg/15D- intermittent	rat	NIOSH
Ethanol	oral	TDLo	30 gm/kg/15D- intermittent	rat	NIOSH
Ethanol	oral	TDLo	90 gm/kg/15D- intermittent	rat	NIOSH
Ethanol	oral	TDLo	65 gm/kg/13D- continuous	rat	NIOSH
Ethanol	oral	TDLo	900 mL/kg/62D- continuous	rat	NIOSH
Ethanol	oral	TDLo	240000 mg/kg/30D- intermittent	rat	NIOSH
Ethanol	oral	TDLo	62.5 gm/kg/5D- continuous	rat	NIOSH
Ethanol	oral	TDLo	62.5 gm/kg/6D- continuous	rat	NIOSH
Ethanol	oral	TDLo	45 gm/kg/30D- intermittent	rat	NIOSH
Ethanol	oral	TDLo	1825 gm/kg/1Y- continuous	rat	NIOSH
Ethanol	oral	TDLo	19 gm/kg/21D- continuous	rat	NIOSH
Ethanol	oral	TDLo	280 gm/kg/5W- intermittent	rat	NIOSH
Ethanol	oral	TDLo	851 gm/kg/10W- continuous	rat	NIOSH
Ethanol	oral	TDLo	7 mL/kg/7D- intermittent	rat	NIOSH
Ethanol	oral	TDLo	6300 mg/kg/9W- intermittent	rat	NIOSH
Ethanol	oral	TDLo	8 mg/kg/4D- intermittent	rat	NIOSH

# safety data sheet

according to (EC) Nr. 1907/2006 (REACH), amended by 2015/830/EU



article: **Isantin**

name of agent	exposure route	endpoint	value	species	source
Ethanol	oral	TDLo	9660 gm/kg/56W- intermittent	rat	NIOSH
Ethanol	oral	TDLo	240 gm/kg/60D- intermittent	rat	NIOSH
Ethanol	oral	TDLo	12 gm/kg/20D- continuous	rat	NIOSH
Ethanol	oral	TDLo	210 gm/kg/10W- continuous	rat	NIOSH
Ethanol	oral	TDLo	4500 gm/kg/24W- intermittent	rat	NIOSH
Ethanol	oral	TDLo	84 gm/kg/4W- intermittent	rat	NIOSH
Ethanol	oral	TDLo	14 gm/kg/7D- intermittent	rat	NIOSH
Ethanol	oral	TDLo	28 gm/kg/7D- intermittent	rat	NIOSH
Ethanol	oral	TDLo	35000 mg/kg/7D- intermittent	rat	NIOSH
Ethanol	oral	TDLo	115000 mg/kg/23D- intermittent	rat	NIOSH
Ethanol	oral	TDLo	67.5 mg/kg/15D- continuous	rat	NIOSH
Ethanol	oral	TDLo	93.8 mL/kg/2W- intermittent	rat	NIOSH
Ethanol	oral	TDLo	882 gm/kg/75D- intermittent	rat	NIOSH
Ethanol	oral	TDLo	72 gm/kg/7D- continuous	rat	NIOSH
Ethanol	oral	TDLo	908 mg/kg/4W- continuous	rat	NIOSH
Ethanol	oral	TDLo	1372 gm/kg/20W- continuous	rat	NIOSH
Ethanol	oral	TDLo	60 gm/kg/30D- intermittent	rat	NIOSH
Ethanol	oral	TDLo	50 gm/kg/10D- intermittent	rat	NIOSH
Ethanol	oral	TDLo	600000 mg/kg/75D- intermittent	rat	NIOSH
Ethanol	oral	TDLo	354000 mg/kg/30D- intermittent	rat	NIOSH
Ethanol	oral	TDLo	462000 mg/kg/6W- intermittent	rat	NIOSH
Ethanol	oral	TDLo	31.5 gm/kg/6D- intermittent	rat	NIOSH
Ethanol	oral	TDLo	126 gm/kg/12W- continuous	rat	NIOSH
Ethanol	oral	TDLo	400 gm/kg/8W- intermittent	rat	NIOSH
Ethanol	oral	TDLo	6650 mL/kg/10W- continuous	rat	NIOSH
Ethanol	oral	TDLo	52800 mg/kg/6D- intermittent	rat	NIOSH
Ethanol	oral	TDLo	52800 mg/kg/6D- intermittent	rat	NIOSH
Ethanol	oral	TDLo	52800 mg/kg/6D- intermittent	rat	NIOSH
Ethanol	oral	TDLo	30 gm/kg/3D- continuous	rat	NIOSH
Ethanol	oral	TDLo	195 gm/kg/30D- continuous	rat	NIOSH
Ethanol	oral	TDLo	420000 mg/kg/12W- intermittent	rat	NIOSH
Ethanol	oral	TDLo	210 gm/kg/6W- intermittent	rat	NIOSH
Ethanol	oral	TDLo	315 gm/kg/9W- intermittent	rat	NIOSH
Ethanol	oral	TDLo	151.2 gm/kg/21D- intermittent	rat	NIOSH
Ethanol	oral	TDLo	50.4 gm/kg/7D- continuous	rat	NIOSH
Ethanol	oral	TDLo	300000 mg/kg/12W- intermittent	rat	NIOSH
Ethanol	oral	TDLo	216000 mg/kg/90D- intermittent	rat	NIOSH
Ethanol	oral	TDLo	355.5 gm/kg/45D- intermittent	rat	NIOSH
Ethanol	oral	TDLo	1814.4 gm/kg/12W- continuous	rat	NIOSH
Ethanol	oral	TDLo	980 gm/kg/8W- continuous	rat	NIOSH
Ethanol	oral	TDLo	140 mL/kg/2W- continuous	rat	NIOSH
Ethanol	oral	TDLo	980 gm/kg/14W- intermittent	rat	NIOSH
Ethanol	oral	TDLo	1050 gm/kg/70D- intermittent	rat	NIOSH
Ethanol	oral	TDLo	188 gm/kg/25D- intermittent	rat	NIOSH
Ethanol	oral	TDLo	665 mL/kg/6W- continuous	rat	NIOSH
Ethanol	oral	TDLo	665 mL/kg/6W- continuous	rat	NIOSH
Ethanol	oral	TDLo	324000 mg/kg/90D- intermittent	rat	NIOSH
Ethanol	oral	TDLo	355.5 gm/kg/45D- intermittent	rat	NIOSH
Ethanol	oral	TDLo	13920 mg/kg/3D- intermittent	rat	NIOSH
Ethanol	oral	TDLo	15000 mg/kg/3D- intermittent	rat	NIOSH
Ethanol	oral	TDLo	21 gm/kg/3W- intermittent	rat	NIOSH
Ethanol	oral	TDLo	252000 mg/kg/90D- intermittent	rat	NIOSH
Ethanol	oral	TDLo	2016 gm/kg/36W- intermittent	rat	NIOSH

# safety data sheet

according to (EC) Nr. 1907/2006 (REACH), amended by 2015/830/EU



article: **Isantin**

name of agent	exposure route	endpoint	value	species	source
Ethanol	oral	TDLo	35 gm/kg/1W- intermittent	rat	NIOSH
Ethanol	skin	NULL	70%/2D	human	NIOSH
Ethanol	skin	mild	400 mg open irritation test	rabbit	NIOSH
Ethanol	skin	moderate	20 mg/24H	rabbit	NIOSH
Ethanol	skin	TDLo	20000 mg/kg	rabbit	NIOSH
Ethanol	subcutaneous	TDLo	5 gm/kg	chicken	NIOSH
Ethanol	subcutaneous	TDLo	6 gm/kg	Dog	NIOSH
Ethanol	subcutaneous	TDLo	7100 mg/kg	frog	NIOSH
Ethanol	subcutaneous	TDLo	19440 mg/kg	infant	NIOSH
Ethanol	subcutaneous	LD <sub>50</sub>	8285 mg/kg	mouse	NIOSH
Ethanol	subcutaneous	TDLo	5 gm/kg	mouse	NIOSH
Ethanol	subcutaneous	TDLo	5 gm/kg	pigeon	NIOSH
Ethanol	subcutaneous	TDLo	20 gm/kg	rabbit	NIOSH
Ethanol	subcutaneous	TDLo	7900 mg/kg	rat	NIOSH
Ethanol	subcutaneous	TDLo	5000 mg/kg/20D- intermittent	mouse	NIOSH
Anisole	inhalative	LC <sub>50</sub>	> 6.51 mg/L/4H	rat	ECHA
Anisole	oral	LD <sub>50</sub>	3700 mg/kg	rat	TOXNET
Anisole	inhalative	TDLo	200 mg/m <sup>3</sup>	human	NIOSH
Anisole	inhalative	TDLo	1880 mg/m <sup>3</sup>	mouse	NIOSH
Anisole	inhalative	LC <sub>50</sub>	3021 mg/m <sup>3</sup> /2H	mouse	NIOSH
Anisole	inhalative	LC <sub>50</sub>	3020 mg/m <sup>3</sup> /2H	mouse	NIOSH
Anisole	inhalative	LC <sub>50</sub>	8949 mg/m <sup>3</sup> /2H	rat	NIOSH
Anisole	inhalative	LC <sub>50</sub>	>5000 mg/m <sup>3</sup>	rat	NIOSH
Anisole	intraperitoneal	TDLo	500 mg/kg	rat	NIOSH
Anisole	oral	LD <sub>50</sub>	2500 mg/kg	guinea pig	NIOSH
Anisole	oral	LD <sub>50</sub>	2800 mg/kg	mouse	NIOSH
Anisole	oral	LD <sub>50</sub>	2900 mg/kg	mouse	NIOSH
Anisole	oral	LD <sub>50</sub>	3700 mg/kg	rat	NIOSH
Anisole	oral	LD <sub>50</sub>	5290 mg/kg	rat	NIOSH
Anisole	inhalative	TDLo	200 mg/m <sup>3</sup>	rat	NIOSH
Anisole	oral	TDLo	118.3 mg/kg	rabbit	NIOSH
Anisole	oral	TDLo	1500 mg/kg	rabbit	NIOSH
Anisole	oral	TDLo	31740 mg/kg	rat	NIOSH
1-Hexanol	oral	LD <sub>50</sub>	720 mg/kg	rat	TOXNET
1-Hexanol	inhalative	LC <sub>50</sub>	> 1060 ppm/6H	rat	TOXNET
1-Hexanol	dermal	LD <sub>50</sub>	3100 µL/kg	rabbit	TOXNET
1-Hexanol	skin	mild	410 mg	rabbit	NIOSH
1-Hexanol	skin	mild	95%/4H	rabbit	NIOSH
1-Hexanol	skin	moderate	95%/24H	rabbit	NIOSH
1-Hexanol	skin	severe	12 mL/6D	rabbit	NIOSH
1-Hexanol	fibroblast	damage	0.5 mmol/L/1H (DNA damage)	human	NIOSH
1-Hexanol	oral	reprod.	10000 mg/kg (6-15D pregnant, reprod. Eff.)	rat	NIOSH
1-Hexanol	inhalative	LC <sub>50</sub>	>1060 ppm	guinea pig	NIOSH
1-Hexanol	inhalative	TDLo	270 mg/m <sup>3</sup>	human	NIOSH
1-Hexanol	inhalative	TDLo	15.8 g/m <sup>3</sup> /2h	mouse	NIOSH
1-Hexanol	inhalative	LC <sub>50</sub>	>1060 ppm/6H	mouse	NIOSH
1-Hexanol	inhalative	LC <sub>50</sub>	>21000 mg/m <sup>3</sup> /1H	rat	NIOSH
1-Hexanol	inhalative	LC <sub>50</sub>	>1060 ppm/6H	rat	NIOSH
1-Hexanol	intraperitoneal	TDLo	170 mg/kg	rat	NIOSH
1-Hexanol	intravenous	LD <sub>50</sub>	130 mg/kg	mouse	NIOSH
1-Hexanol	ocular	TDLo	100 pph	rabbit	NIOSH
1-Hexanol	oral	TDLo	0.92 gm/kg	mouse	NIOSH
1-Hexanol	oral	LD <sub>50</sub>	1950 mg/kg		NIOSH

# safety data sheet

according to (EC) Nr. 1907/2006 (REACH), amended by 2015/830/EU



article: **Isantin**

name of agent	exposure route	endpoint	value	species	source
1-Hexanol	oral	LD <sub>50</sub>	4000 mg/kg	mouse	NIOSH
1-Hexanol	oral	LDLo	1000 mg/kg	mouse	NIOSH
1-Hexanol	oral	LD <sub>50</sub>	710 mg/kg	rat	NIOSH
1-Hexanol	oral	LD <sub>50</sub>	720 mg/kg	rat	NIOSH
1-Hexanol	oral	LD <sub>50</sub>	3131 mg/kg	rat	NIOSH
1-Hexanol	oral	LD <sub>50</sub>	3210 mg/kg	rat	NIOSH
1-Hexanol	oral	LD <sub>50</sub>	4420 mg/kg	rat	NIOSH
1-Hexanol	skin	LD <sub>50</sub>	3100 µL/kg	rabbit	NIOSH
1-Hexanol	skin	LD <sub>50</sub>	2330 mg/kg	rabbit	NIOSH
1-Hexanol	intraperitoneal	TDLo	18450 mg/kg/30W-intermittent	rat	NIOSH
1-Hexanol	oral	TDLo	91 gm/kg/13W- intermittent	dog	NIOSH
1-Hexanol	oral	TDLo	78000 mg/kg/13W- intermittent	dog	NIOSH
1-Hexanol	oral	TDLo	100100 mg/kg/13W- intermittent	dog	NIOSH
1-Hexanol	oral	TDLo	9100 mg/kg/26W- intermittent	rabbit	NIOSH
1-Hexanol	oral	TDLo	101 gm/kg/3W- continuous	rat	NIOSH
2-Butanone	oral	LD <sub>50</sub>	2600-5400 mg/kg	rat	SIDS Draft
2-Butanone	inhalative	LD <sub>50</sub>	> 5000 mg/kg	rat	SIDS Draft
2-Propanol	inhalative	LC <sub>50</sub>	72.6 mg/L/4H	rat	SIDS
2-Propanol	oral	LD <sub>50</sub>	4710 - 5840 mg/kg	rat	SIDS

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).



article: **Isantin**

- **Specific investigations**

It was concluded that the use of Indigo6 to color either collagen or catgut sutures does not affect their safe use in ophthalmological procedures.

- **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 <sub>ow</sub> )	endpoint	value	species	exposure time	source
Indigo	3.1	NOEC EC <sub>25</sub> EC <sub>50</sub>	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 <sub>50</sub> LC <sub>50</sub> LC <sub>50</sub>	>1000 mg/L >1000 mg/L >1000 mg/L	Fish ( <i>Oryzias latipes</i> ) acute	24 h 72 h 96 h	OECD-SIDS
Indigo	3.1	LC <sub>50</sub>	>10'000 mg/L	Fish	24 h	ECHA
Indigo	3.1	LC <sub>50</sub> EC <sub>50</sub> EC <sub>50</sub> (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 <sub>50</sub>	>500 mg/L	aquatic invertebrates		ECHA
Indigo	3.1	EC <sub>50</sub> NOEC	6.5 mg/L 3.1 mg/L	Selenastrum Capricornutum (Algae)	72 h	OECD-SIDS
Indigo	3.1	ErC <sub>50</sub>	>100 mg/L	Algae	72 h	ECHA
Indigo	3.1	EC <sub>50</sub> or LC <sub>50</sub>	1 000 mg/kg soil dw	macroorganisms	Short-term	ECHA
Indigo	3.1	LC <sub>0</sub>	>1000 mg/kg soil	earthworms ( <i>Eisenia foetida</i> )	14d	ECHA
Indigo	3.1	LC <sub>50</sub>	>1000 mg/kg soil	earthworms ( <i>Eisenia foetida</i> )	14d	ECHA
Indigo	3.1	LC <sub>100</sub>	>1000 mg/kg soil	earthworms ( <i>Eisenia foetida</i> )	14d	ECHA
Indigo	3.1	NOEC	62.5 - 1000 mg/kg	earthworms ( <i>Eisenia foetida</i> )	14d	ECHA




# safety data sheet

according to (EC) Nr. 1907/2006 (REACH), amended by 2015/830/EU



article: **Isantin**

 name of agent	Log (K <sub>ow</sub> )	endpoint	value	species	exposure time	source
Ethanol	-0.3	EC <sub>50</sub>	12'340 mg/L	Daphnia magna	48 h	OECD-SIDS
Ethanol	-0.3	LC <sub>50</sub>	1000 mg/L	Palaemonetes kadiakensis	18 h	OECD-SIDS
2-Butanone	0.29	LC <sub>50</sub>	7060 mg/L	Daphnia magna	48 h	SIDS
2-Butanone	0.29	LC <sub>50</sub>	3220 mg/L	Pimephales promelas	96 h	SIDS
2-Propanol	0.05	LC <sub>50</sub>	> 10'000 mg/L	Daphnia magna	24 h	SIDS
2-Propanol	0.05	LC <sub>50</sub>	9640 mg/L	Pimephales promelas	96 h	SIDS
Anisole	2.11	EC <sub>50</sub>	27 mg/L	Daphnia magna	48 h	ECHA
Anisole	2.11	LC <sub>50</sub>	>1 mg/L	Zebrafish (Danio rerio)	96 h	ECOTOX Database
Anisole	2.11	ErC <sub>50</sub>	47 mg/L	Algae	72 h	ECHA
1-Hexanol	2.03	LC <sub>50</sub>	120 mg/L	Fish	96 h	GESTIS
1-Hexanol	2.03	LC <sub>50</sub>	97.5 mg/L	Fathead minnow	96 h	PubChem
1-Hexanol	2.03	LC <sub>50</sub>	130 mg/L	Leuciscus idus (Golden orfe)	48 h	PubChem
1-Hexanol	2.03	ErC <sub>50</sub>	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 <sub>ow</sub> )	endpoint	value	species	exposure time	source
Indigo	3.1	LC <sub>50</sub>	2.6 mg/L	Daphnia magna	21d	SIDS
Indigo	3.1	EC <sub>10</sub> , LC <sub>10</sub> or NOEC	1 000 mg/kg soil dw	soil macroorganisms	Long-term	ECHA
Indigo	3.1	EC <sub>50</sub>	>10'000 mg/L	microorganisms	3h	ECHA
Ethanol	-0.3	LC <sub>50</sub>	11'200 mg/L	Salmo gairdneri	96 h	SIDS
Ethanol	-0.3	LC <sub>50</sub>	12'340 mg/L	Daphnia magna	48 h	SIDS
2-Butanone	0.29	LC <sub>50</sub>	3220 mg/L	Pimephales promela	48 h	SIDS
2-Butanone	0.29	LC <sub>50</sub>	5091 mg/L	Daphnia magna	48 h	SIDS
2-Propanol	0.05	NOEC	141 mg/L	Daphnia magna (Crustacea)	16 d	SIDS
Anisole	2.11	EC <sub>50</sub>	27 mg/L	Freshwater invertebrates	48 h	ECHA
Anisole	2.11	EC <sub>50</sub>	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	EC <sub>10</sub>	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: COHYTHOBIJLSHDF-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.

Theoretical carbon dioxide: Indigo: 2.685 mg/mg (CBS: 1680 mg O<sub>2</sub>/g),

Theoretical oxygen demand: Indigo: 1.952 mg/mg (BSB5: <150 mg O<sub>2</sub>/g).

Biochemical Oxygen Demand: 9 mg/g at 5 d.

Direct photolytic degradation in water: T<sub>1/2</sub> = 0.112 y (SIDS). In soil: anaerobic/bacterial: 90% in 60 days.

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).





article: Isantin

**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 20°C: 1.471, water solubility approx. 15400 mg/L, vapour pressure: 1e-6 mmHg @ 25°C (est). acute toxicity rate LD<sub>50</sub> (oral): 5000 mg/kg, Daphnia: EC<sub>50</sub> (48 h): 692.43 mg/L (est.), Algae: Freshwater: EC<sub>50</sub> (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<sub>6</sub>H<sub>4</sub>C<sub>2</sub>O<sub>3</sub>NH + ROH → C<sub>6</sub>H<sub>4</sub>(CO<sub>2</sub>R)(NH<sub>2</sub>) + CO<sub>2</sub>).

**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<sub>50</sub> = 100-200 mg/L (96h), Daphnia: EC<sub>50</sub> = 85 mg/L (48h). Decomposition of anthranilic acid according to equation: 2 C<sub>7</sub>H<sub>7</sub>NO<sub>2</sub> + 9 O<sub>2</sub> → 7 CO<sub>2</sub> + NH<sub>4</sub><sup>+</sup> + NO<sub>3</sub><sup>-</sup> + 5 H<sub>2</sub>O.

**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. Anisole has a low adsorptivity to soil and if released on soil, may leach. Anisole biodegrades in soil. Over a period of 24 hr, the concentration of anisole was decreased by approximately 93%. Anisole is reported to be 56% biodegradable in the MITI-I-test (OECD 301 C) within 14 d. In the atmosphere, anisole will react with photochemically-produced hydroxyl radicals resulting in an estimated half-life of 22 hr. Anisole decomposes by O-CH<sub>3</sub> bond cleavage, forming a phenoxy radical and a methyl radical.

Theoretical Oxygen Demand: 2.515 mg/mg.

Theoretical Carbon Dioxide: 2.849 mg/mg.

Biochemical oxygen demand: 1.68 g/g (5 h).

Carbon dioxide generation: 77.7 %, time 28 d.

Oxygen depletion: 87 %, time 28 d.

**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.

Half-lives for a model river and model lake are 2 days and 20 days, respectively.


Degradation by photochemically-produced hydroxyl radicals: the half-life for this reaction in air is estimated to be 1.3 days.

Degradation products: Through successive oxidation processes, 1-hexanol is converted to hexanoic acid, which then undergoes beta-oxidation.

Theoretical Oxygen Demand: 2.818 mg/mg

Theoretical Carbon Dioxide: 2.584 mg/mg

**Degradation rates**

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

**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;

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<sub>2</sub>. Biodegradation studies show that 1-hexanol is expected to degrade rapidly in both aerobic and anaerobic conditions.

### 12.3 Bioaccumulative potential (BCF)

Biodegradable and has a low potential to bioaccumulate if BCF <500 or, if absent log Kow <4 (UNECE, Annex 8)

name of agent	BCF [L/kg]	log BCF	route	log Kow	source
Indigo	2.5-4.5	0.40-0.65	soil	2.7 (23 °C), 3.72	SIDS, TOXNET
Ethanol	3	0.48	aquatic organisms	-0.31	PubChem
Anisol	24	1.38	aquatic organisms	2.11	PubChem
1-Hexanol	21	1.32	aquatic organisms	2.03	PubChem
2-Butanone	3	0.48	freshwater fish	0.29	PubChem
2-Propanol	3	0.48	freshwater fish	0.05	PubChem

All components are considered to be not bioaccumulative (U.S. EPA, Toxic Substances Control Act (TSCA), EU, REACH).

### 12.4 Mobility in soil

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

name of agent	log (Koc)	source
Indigo	1.96-3.04, 2.85	QSAR, ECHA
Ethanol	0.02-0.03	QSAR
Anisol	1.54-1.97	QSAR
1-Hexanol	1.25	ECHA
2-Butanone	0.65-1.2	QSAR
2-Propanol	0.19-0.54	QSAR

### 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 Endocrine disrupting properties

Not listed.

### 12.7 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

## safety data sheet

according to (EC) Nr. 1907/2006 (REACH), amended by 2015/830/EU



article: **Isantin**

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	<b>Special precautions for user</b>	
		Provisions for dangerous goods (ADR) should be complied within the premises.
14.7	<b>Transport in bulk according to Annex II of MARPOL and the IBC Code</b>	
		The cargo is not intended to be carried in bulk.
14.8	<b>Information for each of the UN Model Regulations</b>	

### 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

# safety data sheet

according to (EC) Nr. 1907/2006 (REACH), amended by 2015/830/EU



article: **Isantin**

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## 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



### National inventories

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
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
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
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.

### 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.

##### List of substances subject to authorisation (REACH, Annex XIV)/SVHC - candidate list

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.

##### U.S. Department of Homeland Security

This product does not contain any DHS chemicals. Appendix A to Part 27.

# safety data sheet

according to (EC) Nr. 1907/2006 (REACH), amended by 2015/830/EU



article: **Isantin**

**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)

name of agent	Identifier- Number (VwVwS)	water hazard class [WGK]	percentage [%]	states of matter [RT]
Indigo	818	1	>3	solid
Ethanol	96	1	>70	liquid
Anisol	21	2	>5	liquid
1-Hexanol	125	1	>5	liquid
2-Butanon	150	1	<1	liquid
2-Propanol	135	1	<1	liquid

WGK 1: slightly hazardous to water; WGK 2: hazardous to water

## Technical Instructions on Air Quality Control

name of agent	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/m <sup>3</sup>	<sup>1)</sup>
Indigo	A § 3 Abs. 1	dust precipitation		210 mg/(m <sup>2</sup> •d)		
Indigo	CH, 41	limit value for total dust		0.2 kg/h	20 mg/m <sup>3</sup>	
Anisole	D, 5.2.5	organic substances	100 %	0.5 kg/h	50 mg/m <sup>3</sup>	
Anisole	CH, 124	organic substances			100 mg/m <sup>3</sup>	total carbon
1-Hexanol	D, 5.2.5	organic substances	100 %	0.5 kg/h	50 mg/m <sup>3</sup>	
1-Hexanol	CH, 124	organic substances			100 mg/m <sup>3</sup>	total carbon
Ethanol/ 2-Butanone	D, 5.2.5	organic substances	≥ 25 mass.-%	0.5 kg/h	50 mg/m <sup>3</sup>	
Ethanol/ 2-Butanone	CH, 71	organic gaseous, vapour or particulate substances		3 kg/h	150 mg/m <sup>3</sup>	
2-Propanol	D	organic substances	100 %	0.5 kg/h	50 mg/m <sup>3</sup>	
solvents, surface cleaning	EU, 1-5 t/a				20 mg/m <sup>3</sup>	diffuse max. 15 %, <sup>2)</sup>

**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/m<sup>3</sup>.  
2) Council Directive 1999/13/EC of 11 March 1999, Annex IIA, Thresholds and emission limit values, section 4.

name of agent	VOC content [%]	VOC content [g/L]	classification U.S. EPA	source
Indigo	0	0	-	Industrial Emissions Directive (IED)
Ethanol	100	790	VOC	Industrial Emissions Directive (IED)
Anisole	100	990	VOC	Industrial Emissions Directive (IED)
1-Hexanol	100	823	VOC	Industrial Emissions Directive (IED)
2-Butanone	100	810	VOC	Industrial Emissions Directive (IED)
2-Propanol	100	790	VOC	Industrial Emissions Directive (IED)

### • 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.

## safety data sheet

according to (EC) Nr. 1907/2006 (REACH), amended by 2015/830/EU




article: **Isantin**

### 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	substance is listed
CA	DSL	substance is listed	substance is listed	substance is listed
CN	IECSC	substance is listed	substance is listed	substance is listed
EU	ECSI	207-586-9	202-876-1	substance is listed
EU	REACH Reg.	substance is listed	substance is listed	substance is listed
JP	CSCL-ENCS	substance is listed	substance is listed	substance is listed
KR	KECI	substance is listed	substance is listed	substance is listed
MX	INSQ	substance is listed	substance is listed	substance is listed
NZ	NZIoC	-	substance is listed	substance is listed
PH	PICCS	substance is listed	substance is listed	substance is listed
TR	CICR	substance is listed	-	substance is listed
TW	TCSI	substance is listed	substance is listed	substance is listed
US	TSCA	substance is listed	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

CSCL-ENCS Japan, List of Existing and New 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 of indigo, ethanol, anisole and 1-Hexanol are completed (ECHA), but not for the mixture of Isantin.

## 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 toxic for Reproduction




# safety data sheet

according to (EC) Nr. 1907/2006 (REACH), amended by 2015/830/EU



article: **Isantin**


 <b>abbreviation</b>	<b>Descriptions of the abbreviations used</b>
DGUV	Deutsche Gesetzliche Unfallversicherung e. V.
DHS	US Department of Homeland Security
DT <sub>50</sub>	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 <sub>50</sub>	mean effective concentration
ED <sub>50</sub>	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 <sub>10</sub>	concentration of test substance which results in a 10 percent reduction in growth rate (mg/L)
ErC <sub>50</sub>	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
Koc	Organic carbon-water partition co-efficient
Kow	n-octanol-water partition coefficient
KZW	Kurzzeitwert (Short term value)
LD <sub>50</sub>	Letal Dose 50%
LGK	Storage class according to TRGS 510, Germany
log	Logarithm to base 10, decadic logarithm
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
NLP	No-Longer Polymer
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)

## safety data sheet

according to (EC) Nr. 1907/2006 (REACH), amended by 2015/830/EU



article: **Isantin**

 abbreviation	Descriptions of the abbreviations used
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
WEL	Workplace Exposure Limit

### 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. National Library of Medicine, National Institutes of Health, Health & Human Services, WISER
- U.S. Office of Environment, Health, Safety & Security, (PAC-values)
- Regulation (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures.
- Regulation (EC) No. 1907/2006 (REACH), amended by 2020/878/EU.
- Transport of dangerous goods by road, rail and inland waterway (ADR/RID/ADN). International Maritime Dangerous Goods Code (IMDG). Dangerous Goods Regulations (DGR) for the air transport (IATA).

## 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.

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<sup>1</sup> 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."

<sup>2</sup> EU class H066 for anisole (repeated exposure may cause skin dryness or cracking) is not a classification and therefore no risk assessment is required.