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

1.1 Product identifier

Trade name: 2,2',4,4',5,5'-Hexabromobiphenyl (PBB-153) 100 µg/mL in Isooctane

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

General use: specific analysis

1.3 Details of the supplier of the safety data sheet

Company name: LGC Standards GmbH
Street/POB-No.: Mercatorstr. 51
State/city/postal code: D-46485 Wesel
World Wide Web: www.lgcstandards.com
Email: de@lgcstandards.com
Telephone: +49 (0)281-98 87-0
Telefax: +49 (0)281-98 87-199

Dept. responsible for information:
Telephone: +49 (0)281-98 87-0, Email: de@lgcstandards.com

1.4 Emergency telephone number

Telephone: +49 (0)281-98 87-0
Only available during office hours.

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification according to Directive 67/548/EEC or 1999/45/EC

R 11	Highly flammable.
R 38	Irritating to skin.
R 50/53	Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
R 65	Harmful: may cause lung damage if swallowed.
R 67	Vapours may cause drowsiness and dizziness.

2.2 Label elements

Labelling (67/548/EEC or 1999/45/EC)


F


Xn


N

highly flammable harmful dangerous for the environment

R phrase(s):

R 11	Highly flammable.
R 38	Irritating to skin.
R 50/53	Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
R 65	Harmful: may cause lung damage if swallowed.
R 67	Vapours may cause drowsiness and dizziness.

S phrase(s):	S (2)	Keep out of the reach of children.
	S 9	Keep container in a well-ventilated place.
	S 16	Keep away from sources of ignition - No smoking.
	S 29	Do not empty into drains.
	S 33	Take precautionary measures against static discharge.
	S 60	This material and its container must be disposed of as hazardous waste.
	S 61	Avoid release to the environment. Refer to special instructions / safety data sheet.
	S 62	If swallowed, do not induce vomiting: seek medical advice immediately and show this container or label.

Text for labelling: Contains Trimethylpentane.

2.3 Other hazards

No risks worthy of mention.

SECTION 3: Composition/ information on ingredients

3.1 Substances: not applicable

3.2 Mixtures

Hazardous ingredients:

Ingredient	Chemical name	Content	Classification
EINECS - CAS 59080-40-9	2,2',4,4',5,5'-PBB	< 0,1 %	EU: N; R50-53. R33. Xn; R22. Xi; R36/37/38. CLP: Acute Tox. 4; H302. Skin Irrit. 2; H315. Eye Irrit. 2; H319. STOT SE 3; H335. STOT RE 2; H373. Aquatic Acute 1; H400. Aquatic Chronic 1; H410.
EINECS 208-759-1 CAS 540-84-1	2,2,4-Trimethylpentane (Isooctane)	>= 99,9 %	EU: F, Xn, N; R 11, 38, 50/53, 65, 67 CLP: Aquatic Acute 1; H400. Aquatic Chronic 1; H410. Asp. Tox. 1; H304. Flam. Liq. 2; H225. Skin Irrit. 2; H315. STOT SE 3; H336.

SECTION 4: First aid measures

4.1 Description of first aid measures

General information: If victim is at risk of losing consciousness, position and transport on their side.

After inhalation: Move victim to fresh air. In case of breathing difficulties administer oxygen.
In case of irregular breathing or respiratory arrest provide artificial respiration.
Immediately get medical attention.

In case of skin contact: Contaminated/fouled clothing and shoes must be removed immediately.
After contact with skin, wash immediately with soap and plenty of water.
In case of skin reactions, consult a physician.

After eye contact: Immediately flush eyes with plenty of flowing water for 10 to 15 minutes holding eyelids apart.
Subsequently consult an ophthalmologist.

After swallowing: Do not induce vomiting. Immediately get medical attention.
Never give anything by mouth to an unconscious person.
Danger of aspiration! May cause lung damage if swallowed.

4.2 Most important symptoms and effects, both acute and delayed

No data available

4.3 Indication of any immediate medical attention and special treatment needed

When swallowed and vomited immediately, aspiration into the lungs may occur resulting in chemical pneumonia or suffocation.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media:

Extinguishing powder, foam, water fog, carbon dioxide.

Extinguishing media which must not be used for safety reasons:

High power water jet.

5.2 Special hazards arising from the substance or mixture

Highly flammable vapours. Vapours form potentially explosive mixtures with air. Heavier than air, they proceed at floor level and may backflash over great distances when ignited.
In case of fire may be liberated: carbon monoxide and carbon dioxide.

5.3 Advice for firefighters

Special protective equipment for firefighters:

Wear a self-contained breathing apparatus and chemical protective clothing.

Additional information:

Remove all persons whose presence is not necessary in the hazard zone.
Use fine water spray to cool endangered containers. Danger of explosion!
Do not allow water used to extinguish fire to enter drains, ground or waterways. Treat runoff as hazardous. Contaminated fire-fighting water must be collected separately.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Do not touch or step on spilled substance. Keep public away from danger area.
Wear protective equipment. Do not breathe vapours. Provide fresh air.
In case of spills of large quantities: Full protection suit, boots, protective gloves.

6.2 Environmental precautions

Do not allow to penetrate into soil, waterbodies or drains. Danger of explosion!
In case of release, notify competent authorities.

6.3 Methods and material for containment and cleaning up

Take up with non-flammable, liquid binding material (e.g. sand/earth/diatomaceous earth/vermiculit) and perform disposal according to instructions. Thoroughly clean surrounding area.
In case of spills of large quantities: Dam spills with earth or sand. Contact expert.

Additional information:

Remove all sources of ignition. Use explosion-proof equipment and non-sparking tools/utensils.

6.4 Reference to other sections

not required

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advices on safe handling

Provide adequate ventilation, and local exhaust as needed.
Avoid generation of vapours/aerosols. Execute works under fume hood.
Do not inhale substance. Avoid contact with skin, eyes, and clothing.

Precautions against fire and explosion:

Keep away from sources of ignition - No smoking. Take precautionary measures against static discharge. Use explosion-proof machinery, apparatus, ventilation facilities, tools etc. Do not weld. Use only spark proof tools. Concentrated vapours are heavier than air. Beware of reignition.

7.2 Conditions for safe storage, including any incompatibilities

Requirements for storerooms and containers:

Keep container tightly closed and in a well-ventilated place.
Keep away from sources of ignition and heat.

Hints on joint storage: Do not store together with strong oxidizing agents.

Storage class: 3 = Flammable liquids

7.3 Specific end use(s)

No data available

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Additional information: Contains no substances with occupational exposure limit values.

8.2 Exposure controls

Provide good ventilation and/or an exhaust system in the work area.
The substance should only be handled in closed apparatus or systems.

Occupational exposure controls

Respiratory protection: Respiratory protection must be worn whenever the WEL levels have been exceeded.
Combination filter A-P2/P3, identification colour brown-white, according to EN 141.

Hand protection: Protective gloves according to EN 374.
Glove material: nitrile rubber-Layer thickness: 0,40 mm
breakthrough time: >480 min.
Observe glove manufacturer's instructions concerning penetrability and breakthrough time.
Possible alternatives: Fluororubber (Viton).
Unsuitable materials: natural rubber, butyl caoutchouc (butyl rubber), PVC.

Eye protection: Tightly sealed safety glasses according to EN 166.

Body protection: Wear suitable protective clothing.
In case of handling larger quantities: flame-retardant protective clothing, antistatic

General protection and hygiene measures:

Take off immediately all contaminated clothing.
After work, wash hands and face.
When using do not eat, drink or smoke.
Safety shower and eye wash station should be easily accessible to the work area.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state:	liquid
Colour	colourless
Odour:	similar to benzine
Boiling temperature / boiling range	98 - 102 °C (Isooctane)
Flash point / flash point range:	-14 °C
Ignition temperature	410 °C
Explosion limits:	LEL (Lower Explosion Limit): 1,00 Vol-% (Isooctane) UEL (Upper Explosive Limit): 6,50 Vol-% (Isooctane)
Vapour pressure:	at 20 °C: 53 hPa (Isooctane) at 50 °C: 340 hPa (Isooctane)

Density:	at 20 °C: approx. 0,69 g/mL
pH value:	neutral
Water solubility:	at 25 °C: 0,56 mg/L (Isooctane)
Partition coefficient n-octanol /water:	4,5 log P(o/w) (Isooctane)
	An appreciable bioaccumulation potential is to be expected (log P(o/w) >3).

9.2 Other information

No data available

SECTION 10: Stability and reactivity

10.1 Reactivity

No data available

10.2 Chemical stability

Unsuitable materials: various plastics

10.3 Possibility of hazardous reactions

will not occur

10.4 Conditions to avoid

Highly flammable. Keep away from heat sources, sparks and open flames.
With air, vapours form potentially explosive mixtures, which are heavier than air.

10.5 Incompatible materials

strong oxidizing agents

10.6 Hazardous decomposition products

In case of fire may be liberated: carbon monoxide and carbon dioxide.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity:

LD50 Rat, oral:	> 2000 mg/kg (Isooctane)
LC50 Rat, inhalative:	14,5-24,2 mg/L/4h (Isooctane)
LC50 Rat, inhalative:	> 3078 ppm/4h (Isooctane)
LD50 Rabbit, dermal:	> 2000 mg/kg (Isooctane)

After inhalation:	Vapours may cause drowsiness and dizziness. Other symptoms: Irritant effect on the respiratory tract, dizziness, headache, nausea, vomiting, unconsciousness. After absorption of large quantities: narcosis.
After swallowing:	Harmful: may cause lung damage if swallowed. When swallowed and vomited immediately, aspiration into the lungs may occur resulting in chemical pneumonia or suffocation. Other symptoms: Irritations of mucous membranes in the mouth, pharynx, oesophagus and gastrointestinal tract. Nausea, headache, abdominal pain. Risk of resorption.
In case of skin contact:	Irritant. Dry skin, redness, pain. Defatting properties may induce eczema.
After eye contact:	Irritation and redness may occur.

SECTION 12: Ecological information

12.1 Toxicity

Aquatic toxicity: Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Water Hazard Class: 2 = hazardous to water

12.2. Persistence and degradability

Further details: Information about Isooctane:
Biodegradation: >= 70% (OECD 301 E); easily bio-degradable

12.3 Bioaccumulative potential

Partition coefficient n-octanol /water:

4,5 log P(o/w) (Isooctane)

An appreciable bioaccumulation potential is to be expected (log P(o/w) >3).

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

No data available

12.6 Other adverse effects

General information: Do not allow to enter into ground-water, surface water or drains.
Large amounts: Danger to drinking water when soaking into the soil or waters.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product

Waste key number: 16 05 06* = laboratory chemicals consisting of or containing dangerous substances including mixtures of laboratory chemicals.
* = Evidence for disposal must be provided.

Recommendation: Incinerate as hazardous waste according to applicable local, state, and federal regulations.
Discharge into the environment must be avoided.

Contaminated packaging

Waste key number: 15 01 07 = Glass packaging

Recommendation: Dispose of waste according to applicable legislation.
Non-contaminated packages may be recycled.

SECTION 14: Transport information

14.1 UN number

ADR/RID, IMDG, IATA: 1262

14.2 UN proper shipping name

ADR/RID: UN 1262, OCTANES, solution

IMDG, IATA: Octane, solution

14.3 Transport hazard class(es)

ADR/RID:	Class 3, Code: F1
IMDG:	Class 3, Code -
IATA:	Class 3

14.4 Packing group

ADR/RID, IMDG, IATA:	II

14.5 Environmental hazards

Marine Pollutant	Yes

14.6 Special precautions for user

Land transport (ADR/RID)

Warning board:	ADR/RID: Kemmler-number 33, UN number 1262
Hazard label	3
Limited quantities	1 L
EQ	E2
Contaminated packaging: Instructions	P001 IBC02 R001
Special provisions for packing together	MP19
Portable tanks: Instructions	T4
Portable tanks: Special provisions	TP1
Tank coding	LGBF
Tunnel restriction code:	D/E

Sea transport (IMDG)

EmS:	F-E, S-E
Special provisions	-
Limited quantities	1 L
EQ	E2
Contaminated packaging: Instructions	P001
Contaminated packaging: Provisions	-
IBC: Instructions	IBC02
IBC: Provisions	-
Tank instructions: IMO	-
Tank instructions: UN	T4
Tank instructions Provisions	TP1
Stowage and segregation	Category B.
Properties and observations	Colourless liquids. Explosive limits: 1% to 6.5%. ISOOCTANE: Flashpoint -12°C c.c. n-OCTANE: Flashpoint 13°C c.c. Immiscible with water.

Air transport (IATA)

Hazard	Flamm. liquid
EQ	E2
Passenger Ltd.Qty.:	Pack.Instr. Y341 - Max.Qty. 1 L
Passenger:	Pack.Instr. 353 - Max.Qty. 5 L
Cargo:	Pack.Instr. 364 - Max.Qty. 60 L
ERG	3H

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

No data available

SECTION 15: Regulatory information

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

National regulations - Great Britain

Hazchem-Code: 3YE

National regulations - Germany

Storage class: 3 = Flammable liquids

Water Hazard Class: 2 = hazardous to water

Informations on working limitations:

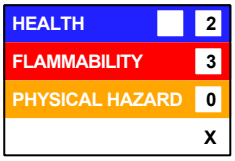
Observe employment restrictions concerning young persons.
Observe employment restrictions for expectant or nursing mothers.

National regulations - USA

Hazard rating systems

NFPA Hazard Rating:
Health: 2 (Moderate)
Fire: 3 (Serious)
Reactivity: 0 (Minimal)

HMIS Version III Rating:
Health: 2 (Moderate)
Flammability: 3 (Serious)
Physical Hazard: 0 (Minimal)
Personal Protection: X = Consult your supervisor



15.2 Chemical Safety Assessment

No data available

SECTION 16: Other information

Further remarks

Only for specialists for purposes of research and analysis

R phrase(s):
R 11 = Highly flammable.
R 22 = Harmful if swallowed.
R 33 = Danger of cumulative effects.
R 36/37/38 = Irritating to eyes, respiratory system and skin.
R 38 = Irritating to skin.
R 50/53 = Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
R 65 = Harmful: may cause lung damage if swallowed.
R 67 = Vapours may cause drowsiness and dizziness.

Reason of change: Changes in section 14: ADR 2011, IATA 2011, General revision

Literature: ICSC 0496

Group that issues data sheet

Contact person: see chapter 1, department responsible for information.

The information in this safety data sheet (SDS) has been prepared with due care and is true and accurate to the best of our knowledge. The user must determine the suitability of the information for its particular purpose, ensure compliance with existing laws and regulations, and be aware that other or additional safety or performance considerations may arise when using, handling and/or storing the material.
The information in this SDS does not purport to be all inclusive or a guarantee as to the properties of the material supplied, and should be used only as a guide. LGC makes no warranties or representations as to the accuracy and completeness of the information contained herein. LGC shall not be held responsible for the suitability of this information for the user's intended purposes or the consequences of such use, and shall not be liable for any damage or loss, howsoever arising, direct or otherwise.