1. SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1 Product identifier

Product Name	PLH-1
Chemical Name	Mixture
CAS No.	Mixture
EINECS No.	Mixture
REACH Registration No.	None assigned.

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

Identified Use(s)	Photostress® measurements.
Uses Advised Against	None known.

1.3 Details of the supplier of the safety data sheet

Company Identification	VISHAY MEASUREMENTS GROUP UK LTD Stroudley Road Basingstoke Hampshire RG24 8FW United Kingdom
Telephone	+44 (0) 1256 462131
Fax	+44 (0) 1256 471441
E-Mail (competent person)	mm.uk@vishaypg.com

1.4 Emergency telephone number

(00-1) 703-527-3887
CHEMTREC

2. SECTION 2: HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

2.1.1 Regulation (EC) No. 1272/2008 (CLP)

Acute Tox. 3; H301
Acute Tox. 3; H311
Skin Corr. 1B; H314
Skin Sens. 1; H317
Acute Tox. 2; H330
STOT SE 3; H335
Muta. 2; H341
Aquatic Acute 1; H400
Aquatic Chronic 1; H410

2.2 Label elements

According to Regulation (EC) No. 1272/2008 (CLP)

Product Name: PLH-1

Hazard Pictogram(s):

Signal Word(s): DANGER

Contains: 2,2'-Iminodi(ethylamine) and M-Phenylenediamine.

Hazard Statement(s):

H301: Toxic if swallowed.
H311: Toxic in contact with skin.
H314: Causes severe skin burns and eye damage.
H317: May cause an allergic skin reaction.
H330: Fatal if inhaled.
H335: May cause respiratory irritation.

H341: Suspected of causing genetic defects.
H400: Very toxic to aquatic life.
H410: Very toxic to aquatic life with long lasting effects.

Precautionary Statement(s)

P280: Wear protective gloves/protective clothing/eye protection/face protection.
P304+P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P301+P330+P331: IF SWALLOWED: rinse mouth. Do NOT induce vomiting.
P303+P361+P353: IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310: Immediately call a POISON CENTER or doctor/physician.

2.3 Other hazards None

3. SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances Not applicable**.**

3.2 Mixtures

EC Classification Regulation (EC) No. 1272/2008 (CLP)

Chemical identity of the substance	%W/W	CAS No.	EC No.	REACH Registration No.	Hazard classification
2,2'-Iminodi(ethylamine)	50	111-40-0	203-865-4	None assigned	Acute Tox. 4; H302 Acute Tox. 4; H312 Skin Corr. 1B; H314 Skin Sens. 1; H317 Acute Tox. 2; H330 STOT SE 3; H335
M-Phenylenediamine	50	108-45-2	203-584-7	None assigned	Acute Tox. 3; H301 Acute Tox. 3; H311 Skin Sens. 1; H317 Eye Irrit. 2; H319 Acute Tox. 3; H331 Muta. 2; H341 Aquatic Acute 1; H400 Aquatic Chronic 1; H410

For full text of H/P Statements see section 16.

4. SECTION 4: FIRST AID MEASURES

4.1 Description of first aid measures

Self-protection of the first aider: Do not breathe vapour. Wear suitable protective clothing. Wear suitable respiratory protective equipment if exposure to high levels of material are likely. Do not use mouth-to-mouth resuscitation. Avoid all contact.

Inhalation: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is laboured, oxygen should be administered by qualified personnel. If breathing has stopped, apply artificial respiration. Immediately call a POISON CENTER/doctor.

Skin Contact: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. Contaminated clothing should be thoroughly cleaned.

		Immediately call a POISON CENTER/doctor. Hot/molten product: Molten material can cause severe burns. Do NOT try to peel molten material from the skin. Cool rapidly with water.
	Eye Contact	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/doctor. Treatment by an ophthalmologist due to possible caustic burn of the eyes may be required.
	Ingestion	IF SWALLOWED: Rinse mouth. Make victim drink plenty of water. Do not induce vomiting unless instructed to do so by medical personnel. Aspiration of vomitus may cause lung injury. Immediately call a POISON CENTER/doctor.
4.2	**Most important symptoms and effects, both acute and delayed**	Toxic if swallowed or in contact with skin. Causes severe skin burns and eye damage. May cause an allergic skin reaction. Due to irritant properties, swallowing may result in burns/ulceration of mouth, stomach and lower gastrointestinal tract with subsequent stricture. Fatal if inhaled. May cause respiratory irritation. Suspected of causing genetic defects. M-Phenylenediamine (CAS# 108-45-2): Severe overexposure may cause facial, pharyngeal, and occasionally, laryngeal edema. Death may be rapid due to acute respiratory distress.
4.3	**Indication of any immediate medical attention and special treatment needed**	Treat symptomatically. IF SWALLOWED: Immediately call a POISON CENTER/doctor. Suggest endotracheal/esophageal control if lavage is done. IF INHALED: Immediately call a POISON CENTER/doctor. IF IN EYES: Obtain prompt consultation, preferably from an ophthalmologist. Chemical eye burns may require extended irrigation. IF ON SKIN: Molten material can cause severe burns. Do NOT try to peel molten material from the skin. Cool rapidly with water. Respiratory symptoms, including pulmonary edema, may be delayed. Persons receiving significant exposure should be observed 24-48 hours for signs of respiratory distress.

5. SECTION 5: FIREFIGHTING MEASURES

5.1	**Extinguishing media**	
	Suitable Extinguishing media	As appropriate for surrounding fire. Extinguish with carbon dioxide, dry chemical, foam or waterspray.
	Unsuitable extinguishing media	Direct water jet may spread the fire. Do not direct a solid stream of water or foam into hot, burning pools; this may cause spattering and increase fire intensity.
5.2	**Special hazards arising from the substance or mixture**	May decompose in a fire giving off toxic fumes. Decomposes in a fire giving off toxic fumes: Nitrogen oxides, Carbon monoxide and Carbon dioxide.
5.3	**Advice for fire-fighters**	Fire fighters should wear complete protective clothing including self-contained breathing apparatus. Do not breathe fumes. Keep containers cool by spraying with water if exposed to fire. Avoid run off to waterways and sewers.

6. SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1	**Personal precautions, protective equipment and emergency procedures**	Evacuate area. Keep upwind. Stop leak if safe to do so. Eliminate all ignition sources if safe to do so. Ensure adequate ventilation. Avoid all contact. Do not breathe vapour. Wear suitable respiratory equipment. Use personal protective equipment as required. See Section: 8.
6.2	**Environmental precautions**	Do NOT wash away into sewer. Spillages or uncontrolled discharges into watercourses must be alerted to the Environment Agency or other appropriate regulatory body.
6.3	**Methods and material for containment and cleaning up**	Ensure full personal protection (including respiratory protection) during removal of spillages. Hot/molten product: Contain spillages. Allow product to cool/solidify and pick up as a solid. Avoid dust generation. Transfer to a container for disposal. Ventilate the area and wash spill site after material pick-up is complete. Wash spill site with water and detergent. Dispose of this material and

its container as hazardous waste (2008/98/EEC).

6.4 Reference to other sections See Section: 8, 13

7. SECTION 7: HANDLING AND STORAGE

7.1 Precautions for safe handling Avoid all contact. Do not breathe vapour. Ensure adequate ventilation. Use personal protective equipment as required. See Section: 8. Do not eat, drink or smoke when using this product. Wash hands before breaks and after work. Protect from moisture. Avoid overheating.

7.2 Conditions for safe storage, including any incompatibilities Store in a well-ventilated place. Keep container tightly closed. Keep cool. Keep away from heat, sources of ignition and direct sunlight. Keep only in original container. Opened containers should be carefully resealed and stored in an upright position. Protect from moisture.

Storage temperature: Ambient.

Storage life: Stable under normal conditions.

Incompatible materials: Keep away from: Nitrosating agents, strong bases, Acids, Strong oxidising agents, Copper (Brass, copper alloy and Bronze) and Amines.
Do not use sodium nitrite or other nitrosating agents in formulations containing this product. Suspected cancer-causing nitrosamines could be formed.

7.3 Specific end use(s) Photostress® measurements.

8. SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

8.1.1 Occupational Exposure Limits

SUBSTANCE	CAS No.	LTEL (8 hr TWA ppm)	LTEL (8 hr TWA mg/m³)	STEL (ppm)	STEL (mg/m³)	Note
2,2'-Iminodi(ethylamine)	111-40-0	1	4.3	-	-	WEL

Note: WEL: Workplace Exposure Limit (UK HSE EH40); Sk:Can be absorbed through skin.

8.1.2 Biological limit value Not established.

8.1.3 PNECs and DNELs Not established.

8.2 Exposure controls

8.2.1 Appropriate engineering controls Ensure adequate ventilation or use appropriate containment. Atmospheric levels should be controlled in compliance with the occupational exposure limit. Guarantee that the eye flushing systems and safety showers are located close to the working place.

8.2.2 Individual protection measures, such as personal protective equipment (PPE) General hygiene measures for the handling of chemicals are applicable. Avoid all contact. Do not breathe vapour. Wash hands before breaks and after work. Keep work clothes separately. Contaminated clothing should be laundered before reuse. Contaminated leather articles should be discarded (e.g. shoes). Do not eat, drink or smoke at the work place.

Eye/ face protection

Wear protective eye glasses for protection against liquid splashes. Wear eye protection with side protection (EN166).

Skin protection

Hand protection: Wear impervious gloves (EN374). Gloves should be changed regularly to avoid permeation problems. Breakthrough time of the glove material: refer to the information provided by the gloves' producer. Recommended: Butyl rubber or Neoprene. Hot/molten product: Wear insulating gloves EN407 (heat).

Body protection: Wear impervious protective clothing, including boots, lab coat,

	apron or coveralls, as appropriate, to prevent skin contact.
Respiratory protection 	Work in well ventilated zones or use proper respiratory protection. Open system(s): Wear suitable respiratory protection. Recommended: Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard. In case of high airborne concentrations, wear suitable positive pressure respiratory protection equipment.
Thermal hazards	Not applicable.

8.2.3 Environmental Exposure Controls — Avoid release to the environment.

9. SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance	Dark brown Liquid
Odour	Faint Ammonia odour.
Odour threshold	Not available.
pH	Not established.
Melting point/freezing point	Not established.
Initial boiling point and boiling range	199℃
Flash point	101℃ [Closed cup]
Evaporation rate	Not available.
Flammability (solid, gas)	Not applicable - liquid.
Upper/lower flammability or explosive limits	Not applicable.
Vapour pressure	<1 mm Hg
Vapour density	>1 (Air = 1)
Relative density	1.05 (H_2O = 1)
Solubility(ies)	Partly soluble in water.
Partition coefficient: n-octanol/water	Not available.
Auto-ignition temperature	Not applicable.
Decomposition Temperature	Not available.
Viscosity	Not available.
Explosive properties	Not explosive.
Oxidising properties	Not oxidising.

9.2 Other information — None

10. SECTION 10: STABILITY AND REACTIVITY

10.1	**Stability and reactivity**	Stable under normal conditions.
10.2	**Chemical stability**	Stable under normal conditions.
10.3	**Possibility of hazardous reactions**	Reaction with some curing agents may produce considerable heat. Can react vigorously with strong Lewis or mineral acids and strong mineral and organic bases, especially primary and secondary aliphatic amines. Do not use sodium nitrite or other nitrosating agents in formulations containing this product. Suspected cancer-causing nitrosamines could be formed.
10.4	**Conditions to avoid**	Keep away from heat, sources of ignition and direct sunlight. Avoid overheating.
10.5	**Incompatible materials**	Keep away from: Nitrosating agents, strong bases, Acids, Strong oxidising agents, Copper (Brass, copper alloy and Bronze) and Amines.
10.6	**Hazardous decomposition product(s)**	Decomposes in a fire giving off toxic fumes: Nitrogen oxides, Carbon monoxide and Carbon dioxide.

11. SECTION 11: TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects (Substances in preparations / mixtures)

Acute toxicity

Ingestion	Acute Tox. 3: Toxic if swallowed. Acute Toxicity Estimate Mixture Calculation: Estimated LC50 167 mg/kg bw/day.
Inhalation	Acute Tox. 2: Fatal if inhaled.

		Acute Toxicity Estimate Mixture Calculation: Estimated LC50 0.9 mg/l.
	Skin Contact	Acute Tox. 3: Toxic in contact with skin. Acute Toxicity Estimate Mixture Calculation: Estimated LC50 471 mg/kg bw/day.
	Skin corrosion/irritation	Skin Corr. 1B: Causes severe skin burns.
	Serious eye damage/irritation	Skin Corr. 1B: Causes serious eye damage.
	Respiratory or skin sensitization	Skin Sens. 1: May cause an allergic skin reaction.
	Germ cell mutagenicity	Muta. 2: Suspected of causing genetic defects.
	Carcinogenicity	Based upon the available data, the classification criteria are not met.
	Reproductive toxicity	Based upon the available data, the classification criteria are not met.
	STOT - single exposure	STOT SE 3: May cause respiratory irritation.
	STOT - repeated exposure	Based upon the available data, the classification criteria are not met.
	Aspiration hazard	Based upon the available data, the classification criteria are not met.
11.2	**Other information**	None.

12. SECTION 12: ECOLOGICAL INFORMATION

12.1	**Toxicity**	Aquatic Acute 1: Very toxic to aquatic life. Aquatic Chronic 1: Very toxic to aquatic life with long lasting effects. Estimated Mixture LC50 < 1 mg/l (Fish)
12.2	**Persistence and degradability**	Part of the components are poorly biodegradable.
12.3	**Bioaccumulative potential**	The product has low potential for bioaccumulation.
12.4	**Mobility in soil**	The product is predicted to have moderate mobility in soil (Partly soluble in water).
12.5	**Results of PBT and vPvB assessment**	Not classified as PBT or vPvB.
12.6	**Other adverse effects**	None known.

13. SECTION 13: DISPOSAL CONSIDERATIONS

13.1	**Waste treatment methods**	Do NOT wash away into sewer. This material and its container must be disposed of as hazardous waste (2008/98/EEC). Containers of this material may be hazardous when empty since they retain product residue. Dispose of wastes in an approved waste disposal facility.
13.2	**Additional Information**	Dispose of contents in accordance with local, state or national legislation.

14. SECTION 14: TRANSPORT INFORMATION

		ADR/RID / IMDG / IATA
14.1	**UN number**	UN 2927
14.2	**UN proper shipping name**	TOXIC LIQUID, CORROSIVE, ORGANIC, N.O.S. (2,2'-Iminodi(ethylamine))
14.3	**Transport hazard class(es)**	6.1 + 8
14.4	**Packing group**	II
14.5	**Environmental hazards**	Classified as a Marine Pollutant/Environmentally hazardous substance.
14.6	**Special precautions for user**	See Section: 2
14.7	**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code**	Not applicable.
14.8	**Additional Information**	None

15. SECTION 15: REGULATORY INFORMATION

15.1	**Safety, health and environmental regulations/legislation specific for the substance or mixture**	
15.1.1	**EU regulations**	
	Substance(s) of Very High Concern (SVHCs)	None.
	Authorisations and/or Restrictions On Use	None.
15.1.2	**National regulations**	
	Wassergefährdungsklasse (Germany)	Water hazard class: 2

15.2 Chemical Safety Assessment Not available.

16. SECTION 16: OTHER INFORMATION

The following sections contain revisions or new statements: 1-16.

References: Existing Safety Data Sheet (SDS), Harmonised Classification(s) for 2,2'-iminodiethylamine (CAS# 111-40-0) and M-Phenylenediamine (CAS# 108-45-2). Existing ECHA registration(s) for 2,2'-iminodiethylamine (CAS# 111-40-0) and M-Phenylenediamine (CAS# 108-45-2).
EU Classification: This Safety Data Sheet was prepared in accordance with EC Regulation (EC) 1907/2006 (REACH), 1272/2008 (CLP) & 2015/830.

Classification of the substance or mixture According to Regulation (EC) No. 1272/2008 (CLP)	**Classification Procedure**
Acute Tox. 3; H301	Acute Toxicity Estimate Mixture Calculation
Acute Tox. 3; H311	Acute Toxicity Estimate Mixture Calculation
Skin Corr. 1B; H314	Threshold Calculation
Skin Sens. 1; H317	Threshold Calculation
Acute Tox. 2; H330	Acute Toxicity Estimate Mixture Calculation
STOT SE 3; H335	Threshold Calculation
Muta. 2; H341	Threshold Calculation
Aquatic Acute 1; H400	Summation Calculation
Aquatic Chronic 1; H410	Summation Calculation

LEGEND

LTEL: Long Term Exposure Limit
STEL: Short Term Exposure Limit
DNEL: Derived No Effect Level
PNEC: Predicted No Effect Concentration
PBT: Persistent, Bioaccumulative and Toxic
vPvB: very Persistent and very Bioaccumulative

Hazard Statement(s)

H301: Toxic if swallowed.
H302: Harmful if swallowed.
H311: Toxic in contact with skin.
H312: Harmful in contact with skin.
H314: Causes severe skin burns and eye damage.
H317: May cause an allergic skin reaction.
H319: Causes serious eye irritation.
H330: Fatal if inhaled.
H331: Toxic if inhaled.
H335: May cause respiratory irritation.
H341: Suspected of causing genetic defects.
H400: Very toxic to aquatic life.
H410: Very toxic to aquatic life with long lasting effects.

Training advice: Consideration should be given to the work procedures involved and the potential extent of exposure as they may determine whether a higher level of protection is required.

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Annex to the extended Safety Data Sheet (eSDS)

No information available.

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