SAFETY DATA SHEET

Ikaros Parachute Rocket, White

The safety data sheet is in accordance with Commission Regulation (EU) 2015/830 of 28 May 2015 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)

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

Date issued	23.11.2016
Revision date	24.11.2017

1.1. Product identifier

Product name	Ikaros Parachute Rocket, White
Article no.	340200 (Order number (340200, 340270 and 340280)
Product definition	6,5 g ignition composition, 50 g composite propellant and 100 g white illuminating composition

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

Use of the substance / preparation	Pyrotechnic signal rocket.

1.3. Details of the supplier of the safety data sheet

Company name	Nammo Sweden AB

1.4. Emergency telephone number

Identification, comments	Ask for officer on duty at Nammo LIAB AB.

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008 [CLP / GHS]	Expl. 1.3; H203 Acute tox. 4; H302 Eye Irrit. 2; H319
Substance / mixture hazardous properties	Main health hazard: Pyrotechnic product. Inhalation: May be mildly irritating to the respiratory system. Contact with skin: May be mildly irritating to the skin. Contact with burning product can cause severe burns. Contact with eyes: Causes serious eye irritation. Ingestion: Harmful if swallowed. Fire and explosion hazard: Risk of explosion if the product is exposed to electric shock, friction, fire or other sources of ignition. Environmental hazard: Not classified as dangerous to the environment.

2.2. Label elements

Hazard pictograms (CLP)

Composition on the label	Sodium nitrate = 31,37 %, Potassium perchlorate = 23,32 %
Signal word	Danger
Hazard statements	H203 Explosive; fire, blast or projection hazard.
Precautionary statements	P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. P230 Keep wetted with P234 Keep only in original container. P240 Ground / bond container and receiving equipment. P250 Do not subject to grinding / shock / / friction. P280 Wear protective gloves / protective clothing / eye protection / face protection. P370 + P372 + P380 + P373 In case of fire: Explosion risk. Evacuate area. DO NOT fight fire when fire reaches explosives.
Special supplemental label information mixtures	Contains: Sodium nitrate and Potassium perchlorate .

2.3. Other hazards

Description of hazard	Contact with burning product can cause severe burns.

SECTION 3: Composition / information on ingredients

3.2. Mixtures

Substance	Identification	Classification	Contents	Notes
Sodium nitrate	CAS No.: 7631-99-4 EC No.: 231-554-3 REACH Reg. No.: 01-2119488221-41	Ox. Sol. 3; H272 Acute tox. 4; H302 Skin Irrit. 2; H319	= 31,37 %	
Potassium perchlorate	CAS No.: 7778-74-7 EC No.: 231-912-9	Ox. Sol. 1; H271 Acute tox. 4; H302	= 23,32 %	

	Index No.: 017-008-00-5 REACH Reg. No.: 01-2120021000-89		
Potassium nitrate	CAS No.: 7757-79-1 EC No.: 231-818-8 REACH Reg. No.: 01-2119488224-35	Ox. Sol. 3; H272 Aquatic Acute 1; H400	= 3,07 %
Sulphur	CAS No.: 7704-34-9 EC No.: 231-722-6 Index No.: 016-094-00-1 REACH Reg. No.: 01-2119487295-27	Skin Irrit. 2; H315	= 0,45 %

SECTION 4: First aid measures

4.1. Description of first aid measures

General	Contaminated work clothing should be washed before using again. Special treatment is urgent (see label on this label).
Inhalation	Move the person to fresh air and keep at rest in a position comfortable for breathing. Consult a doctor if symptoms persist.
Skin contact	If burned, rinse with plenty of water for at least 20 minutes. In case of any other contact with skin, wash with soap and water for several minutes.
Eye contact	Hold eyelids open and rinse with soft, lukewarm water or eye wash liquid for at least five minutes. Remove contact lenses. Consult a doctor if symptoms persist.
Ingestion	Get medical advice/attention.

4.2. Most important symptoms and effects, both acute and delayed

Acute symptoms and effects	Contact with burning product can cause severe burns. May cause nausea and vomiting. Harmful if swallowed. Causes serious eye irritation. May be mildly irritating to the skin and respiratory system.

4.3. Indication of any immediate medical attention and special treatment needed

Medical treatment	None other than the one listed above.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media	Use foam, dry chemical, CO2 or mist early in the fire. Once the product is lit up, it is very difficult to extinguish.
Improper extinguishing media	No restrictions.

5.2. Special hazards arising from the substance or mixture

Fire and explosion hazards	The product is an explosion hazard, as it generates large quantities of gas and heat, once lit.

5.3. Advice for firefighters

Personal protective equipment	Wear full protective clothing for chemical fires, including breathing apparatus. If possible, remove undamaged containers from the danger area. Remove all ignition sources.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal protection measures	Ensure good ventilation. Use appropriate protective equipment, see section 8. Avoid skin and eye contact. Remove all ignition sources.

6.2. Environmental precautions

Environmental precautionary measures	Prevent discharge into sewers or the local environment/streams. Contact emergency services upon greater emissions.

6.3. Methods and material for containment and cleaning up

Cleaning method	Collect with tools that do not give rise to ignition. The waste is placed in closed containers and disposed of as hazardous waste in accordance with section 13.

6.4. Reference to other sections

Other instructions	See sections 8 and 13 for information about protection and waste management.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Handling	Avoid sparks, shock and friction. Use personal protective equipment, see section 8. Avoid skin and eye contact. Protect the product from sources of ignition.

7.2. Conditions for safe storage, including any incompatibilities

Storage	Store cool and dry in a well-ventilated place. Keep away from sources of ignition - no smoking. Keep out of reach of children.

7.3. Specific end use(s)

Specific use(s)	Signal rocket.

SECTION 8: Exposure controls / personal protection

8.1. Control parameters

Other Information about threshold limit values	No exposure limits.
Control parameters comments	PNEC/DNEL are not available.

8.2. Exposure controls

Precautionary measures to prevent exposure

Appropriate engineering controls	Keep away from fire, sparks and other ignition sources. When cleaning, use

equipment that does not cause sparks.

Eye / face protection

Eye protection	Shatterproof goggles or visors.

Hand protection

Hand protection	Leather gloves or the like.

Skin protection

Skin protection (except hands)	Normal industrial hygiene.

Respiratory protection

Respiratory protection	Upon dust formation, use a particle filter EN143 Type P or EN149 type FFP-S.
Recommended type of equipment	Particle filter EN143 Type P or EN149 type FFP-S.

Hygiene / environmental

Personal protection equipment, comments	Contact your protective equipment supplier for more information.
Specific hygiene measures	No smoking.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	Red plastic tube with white plastic lid and orange label.
Colour	See under "Physical state".
Odour	None.
pH	Status: In delivery state Comments: No information available. Status: In aqueous solution Comments: No information available.
Melting point / melting range	Comments: No information available.
Boiling point / boiling range	Comments: No information available.
Flash point	Comments: No information available.
Evaporation rate	Comments: No information available.
Flammability (solid, gas)	The contents are flammable.
Explosion limit	Comments: No information available.
Vapour pressure	Comments: No information available.
Vapour density	Comments: No information available.
Relative density	Comments: No information available.
Solubility in water	Insoluble.

Spontaneous combustability	Value: > 250 °C Method: Ignition temperature
Viscosity	Comments: No information available.
Explosive properties	The product is explosive.
Oxidising properties	Content is oxidizing.

9.2. Other information

Other physical and chemical properties

Comments	These are typical values and do not constitute an exact product specification.

SECTION 10: Stability and reactivity

10.1. Reactivity

Reactivity	Stable product under recommended storage and handling conditions.

10.2. Chemical stability

Stability	Stable product under recommended storage and handling conditions.

10.3. Possibility of hazardous reactions

Possibility of hazardous reactions	Stable product under recommended storage and handling conditions.

10.4. Conditions to avoid

Conditions to avoid	Avoids temperatures above 75°C.

10.5. Incompatible materials

Materials to avoid	Not applicable.

10.6. Hazardous decomposition products

Hazardous decomposition products	The product is explosive, generating large quantities of gas and heat once ignited.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Substance	Sodium nitrate
Acute toxicity	**Type of toxicity:** Acute **Effect tested:** LD50 **Route of exposure:** Oral **Value:** = 1267 mg/kg **Animal test species:** Rat **Comments:** Harmful if swalowed.
Substance	Potassium nitrate

Acute toxicity	**Type of toxicity:** Acute **Effect tested:** LD50 **Route of exposure:** Oral **Value:** = 3750 mg/kg **Animal test species:** Rat
Substance	Sulphur
Acute toxicity	**Type of toxicity:** Acute **Effect tested:** LD50 **Route of exposure:** Oral **Value:** > 3000 mg/kg **Animal test species:** Rat **Comments:** Not hazardous if swallowed. **Type of toxicity:** Acute **Effect tested:** LD50 **Route of exposure:** Dermal **Value:** > 2000 mg/kg **Animal test species:** Rabbit **Comments:** Not hazardous in case of skin contact.
Other toxicological data	No data available for the product itself. The data below is based on individual ingredients of the product.

Other information regarding health hazards

General	Hazardous ingredients: potassium perchlorate, sulphur and sodium nitrate . Calculated ATE: 2117 mg/kg (not classified as harmful)
Inhalation	May be mildly irritating to the respiratory system.
Skin contact	May be mildly irritating to the skin.
Eye contact	Causes serious eye irritation.
Ingestion	Harmful if swallowed. May cause irritation of the gastrointestinal tract with nausea and vomiting as a result.
General respiratory or skin sensitisation	No known sensitizing effect.
Inhalation	May be mildly irritating to the respiratory system.
Skin contact	May be mildly irritating to the skin.
Eye contact	Causes serious eye irritation.
Ingestion	May cause nausea and vomiting.
Germ cell mutagenicity, human experience	No known mutagenicity.
Carcinogenicity, other information	No known carcinogenicity.
Reproductive toxicity	No known reproductive toxicity.
STOT-repeated exposure	Not known.
Aspiration hazard	No aspiration hazard known.

SECTION 12: Ecological information

12.1. Toxicity

Substance	Sodium nitrate
Aquatic toxicity, fish	**Value:** = 994 mg/l **Test duration:** 96h **Species:** Oncorhynchus tshawytscha **Method:** LC50 **Comments:** Not hazardous to aquatic organisms.
Substance	Potassium perchlorate
Aquatic toxicity, fish	**Value:** = 2511 mg/l **Test duration:** 96h **Method:** LC50 **Comments:** Not hazardous to aquatic organisms.
Substance	Sulphur
Aquatic toxicity, fish	**Value:** = 866 mg/l **Test duration:** 96h **Species:** Brachydanio rerio **Method:** LC50 **Comments:** Not hazardous to aquatic organisms.
Substance	Potassium nitrate
Aquatic toxicity, algae	**Value:** = 0,14 mg/l **Test duration:** 72h **Method:** IC50 **Comments:** Very toxic to aquatic organisms.
Substance	Sodium nitrate
Aquatic toxicity, crustacean	**Value:** = 575,9 mg/l **Test duration:** 48h **Method:** EC50 **Comments:** Not hazardous to aquatic organisms.
Substance	Sulphur
Aquatic toxicity, crustacean	**Value:** > 5000 mg/l **Test duration:** 48h **Species:** D.magna **Method:** EC50 **Comments:** Not hazardous to aquatic organisms.
Ecotoxicity	Producted has not been tested. The data below is based on individual ingredients of the product.

12.2. Persistence and degradability

Persistence and degradability, comments	Not applicable. Contains inorganic materials and is in solid form.

12.3. Bioaccumulative potential

Bioaccumulative potential	Not expected to bioaccumulate.

12.4. Mobility in soil

Mobility	None – product in form of solid article.
Water solubility	Comments: Insoluble.

12.5. Results of PBT and vPvB assessment

PBT assessment results	Does not fulfil the criteria for classification as PBT.
vPvB evaluation results	Does not fulfil the criteria for classification pub.

12.6. Other adverse effects

Environmental details, summation	Not classified as toxic to water (the IMDG-code).

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Specify the appropriate methods of disposal	Waste should be collected in a separate container. NO SMOKING!
Relevant waste regulation	Waste regulation, SFS 2011:927.
Hazardous waste product	Unused product is hazardous waste and must be disposed of in accordance with national and local regulations. Contact approved waste disposal service to dispose of this material.
Hazardous waste packing	Used product treated as ordinary plastic / metallic waste. DO NOT TRY TO DISASSEMBLE UNUSED PRODUCT! Contaminated packaging may pose a fire hazard.
Product classified as hazardous waste	Yes
Packaging classified as hazardous waste	Yes
EWC waste code	EWC: 160402 fireworks wastes
Other information	Contaminated packing may burn rapidly.

SECTION 14: Transport information

14.1. UN number

ADR/RID/ADN	0403
IMDG	0403
ICAO/IATA	0403
Comments	Article Number: 340280

14.2. UN proper shipping name

ADR/RID/ADN	FLARES, AERIAL
IMDG	FLARES, AERIAL
ICAO/IATA	FLARES, AERIAL

14.3. Transport hazard class(es)

ADR/RID/ADN	1.4G
IMDG	1.4G
ICAO/IATA	1.4G

14.4. Packing group

14.5. Environmental hazards

14.6. Special precautions for user

Special safety precautions for user	See P-statements in Section 2.2.

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

Additional information

Additional information	UN-number: 0403 Flares, aerial. Packaging in steel cage + cardboard: 1.4G. P135. Order article number: 340280 UN-number: 0506 Signals, distress, ship. Packaging in steel cage + cardboard: 1.4S (not USA). Packaging instructions: P135. Order article number: 340270 UN-number: 0195 Signals, distress. Packaging in cardboard : 1.3G (not USA). Packaging instructions: P135. Article number: 340200

IMDG Other information

IMDG Other information	Swedish Rescue Service Agency Cert. No.: 2009-4265 (UN-nr 0195 och 0506), 1312-5554-2005 (UN-nr 0404) . EX-nr (DOT/USA): EX2007050373 (1.4G)
EmS	F-B, S-X

SECTION 15: Regulatory information

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

Legislation and regulations	Safety data sheet and classification in accordance with regulation 1272/2008 /EC (CLP) and regulation 830/2015/EC.

15.2. Chemical safety assessment

Chemical safety assessment performed	Yes
Chemical safety assessment	Chemical safety investigation (CSI) is established for the product.

SECTION 16: Other information

List of relevant H-phrases (Section 2 and 3)	H203 Explosive; fire, blast or projection hazard. H271 May cause fire or explosion; strong oxidiser. H272 May intensify fire; oxidiser. H302 Harmful if swallowed.

	H315 Causes skin irritation. H319 Causes serious eye irritation. H400 Very toxic to aquatic life.
Classification according to Regulation (EC) No 1272/2008 [CLP / GHS]	Expl. 1.3; H203 Acute tox. 4; H302 Eye Irrit. 2; H319
CLP classification, comments	Classification and labelling are based on CLP (Regulation 1272/2008/EC and Regulation 830/2015/EC)
Last update date	24.11.2017
Version	4

MarED

The Group of Notified Bodies for the Implementation of the European Marine Equipment Directive EU Directive 2014/90/EU (MED) as amended

Mared Product Database

Product Information

Product name:	**IKAROS Parachute Rocket, Red, Article N° 340 100**
Trade name:	Rocket parachute flares (pyrotechnics)
Restriction of use:	

APPLICANT/MANUFACTURER (PLACING THE PRODUCT ON THE MARKET)

Applicant:	Nammo Sweden AB

MED Conformity Information

Applied directive:	2014/93/EU MED (10th Amendment)
Item category:	96/98/EC
Item number and designation:	A.1/1.8 Rocket parachute flares (pyrotechnics)
Applied module(s):	B+D
Status of MED certificates (Combined validity period):	2016-09-05 - 2019-07-17

Information on MED certificate(s)

Certificate number of type examination (B):	06553/D1 EC
Period of validity of type examination certificate:	2015-11-12 - 2019-07-17
Comments to type examination certificate:	
Certificate number of production/product module (D, E, F) or unit verification (G):	MEDD00000DV Rev. 1
Comments to production/product module or unit verification:	
Period of validity of production/product module or unit verification certificate:	2016-09-05 - 2021-09-04
Comments to date of expiry of production module certificate:	
USCG MRA approval number:	160.136/EC0062/06553-D1EC/EC0575
Comments to USCG approval:	

Notified Body

Notified Body issuing type approval (B) certification:	0062 - Bureau Veritas
Notified Body responsible for the MED assessment:	DNV GL AS (former DNV AS)

Please note, that the information provided has been prepared accurately and to the best knowledge. However, the information is indicative only. There is no guarantee for completeness, actuality or an absolute correctness. For further clarification, please contact the indicated Notified Bodies or the companies offering the products to the market directly.

DNV·GL

Certificate No:
MEDB000053J

EC-TYPE EXAMINATION CERTIFICATE (MODULE B)

Application of: Directive 2014/90/EU of 23 July 2014 on marine equipment (MED), issued as "Forskrift om Skipsutstyr" by the Norwegian Maritime Authority. This Certificate is issued by DNV GL AS under the authority of the Government of Norway.

This is to certify:

That the Rocket parachute flares (pyrotechnics)

with type designation(s)
IKAROS Parachute Rocket, Red

Issued to
Hansson PyroTech AB

is found to comply with the requirements in the following Regulations/Standards:
Regulation **(EU) 2018/773,**
item No. MED/1.8. SOLAS 74 as amended, Regulation III/4, III/6, III/34 & X/3, LSA Code and 2000 HSC Code 8

Further details of the equipment and conditions for certification are given overleaf.

This Certificate is valid until **2024-07-03**.
Issued at **Høvik** on **2019-07-04**

DNV GL local station:
Stockholm

Approval Engineer:
Jasna Jovovic-Lainis

Notified Body
No.: **0575**

for **DNV GL AS**

Head of Notified Body

A U.S. Coast Guard approval number will be assigned to the equipment when the production module has been completed and will appear on the production module certificate (module D, E or F), as allowed by the "Agreement between the United States of America and the EEA EFTA states on the mutual recognition of Certificates of Conformity for Marine Equipment" signed 17 October 2005.

The mark of conformity may only be affixed to the above type approved equipment and a Manufacturer's Declaration of Conformity issued when the production-surveillance module (D, E or F) of Annex B of the MED is fully complied with and controlled by a written inspection agreement with a Notified Body. The product liability rests with the manufacturer or his representative in accordance with Directive 2014/90/EU.
This certificate is valid for equipment, which is conform to the approved type. The manufacturer shall inform DNV GL AS of any changes to the approved equipment. This certificate remains valid unless suspended, withdrawn, recalled or cancelled.
Should the specified regulations or standards be amended during the validity of this certificate, the product is to be re-approved before being placed on board a vessel to which the amended regulations or standards apply.

NORWEGIAN ACCREDITATION PROD 019

Job Id: **344.1-009129-1**
Certificate No: **MEDB000053J**

Product description

"IKAROS Parachute Rocket, Red"
rocket parachute flares ejecting a red flare on a parachute at 300 m altitude with burning time not less than 40 seconds and with average luminous intensity of minimum 30.000 candela.

Design weight: 400 ±5% g

Application/Limitation

Approved for use as Rocket parachute flares (pyrotechnics).

Acceptable lifetime: 4 years

Liferaft drop test has to be performed before installation on liferafts.

The design assessment is based on IMO Res. MSC.48(66) as amended by IMO Res. MSC.207(81) and IMO Res. MSC.218(82).

A statistically adequate sample of the production shall be tested in accordance with IMO Res. MSC.81(70), Part 2, Ch.4.

Type Examination documentation

The following documentation is basis for the DNV GL approval:

Documents	Date
Drawings as listed in "Document structure", No. DS 340100 Rev. 3	2019-02-01
Prototype test reports witnessed by Bureau Veritas	2015-03-31 & 2015-08-18 2013-10-03 2012-05-31 2011-08-18 2008-10-13~16 & 2008-11-07 2004-11-15

Tests carried out

Tests are documented in accordance with recommendation on testing of Lifesaving Appliances, IMO Res. MSC.81(70), Part 1, including IMO Res. MSC.200(80), IMO Res. MSC.226(82) and IMO Res. MSC.323(89).

Marking of product

The product is to be marked with name and address of manufacturer, type designation, date of manufacture, date of expiry, operational restrictions, Mark of Conformity and USCG number if applicable (see first page).

The product should be provided with brief instructions or diagrams clearly illustrating the use printed on the casing.

DNV·GL

Certificate No:
MEDD00001TR

QS – CERTIFICATE OF ASSESSMENT – EC (MODULE D)

Application of: Directive 2014/90/EU of 23 July 2014 on marine equipment (MED), issued as "Forskrift om Skipsutstyr" by the Norwegian Maritime Authority. This Certificate is issued by DNV GL AS under the authority of the Government of Norway.

This is to certify:

That the Quality System for the products

with type designation(s) as specified in the Appendix to this Certificate

Issued to

Hansson PyroTech AB

is found to comply with the applicable requirements.
The quality system has been assessed with respect to the procedure of conformity assessment described in Annex II, Module D in the directive 2014/90/EU and regulation (EU) 2018/773.

This Certificate is valid until **2021-09-04**.
Issued at **Høvik** on **2019-09-27**

DNV GL local station:
Stockholm

Approval Engineer:
Jasna Jovovic-Lainis

Notified Body
No.: **0575**

for **DNV GL AS**

Head of Notified Body

The manufacturer is allowed to affix the U.S. Coast Guard approval number(s) as stated in the appendix attached hereto and as allowed by the "Agreement between the United States of America and the EEA EFTA states on the mutual recognition of Certificates of Conformity for Marine Equipment" signed 17 October 2005.

0575/yyyy

0575: Notified Body number undertaking quality surveillance
yyyy: The year in which the mark is affixed

NORWEGIAN ACCREDITATION PROD 019

The product liability rests with the manufacturer or his representative in accordance with Directive 2014/90/EU.
This certificate authorizes the manufacturer in conjunction with the valid EC Type Examination (Module B) Certificate(s) of the equipment listed before to affix the Mark of Conformity (wheelmark) to the product described herein.
This certificate loses its validity if the manufacturer makes any changes to the approved quality system which have not been notified to and agreed with the notified body named on this certificate.
This certificate remains valid unless suspended, withdrawn, recalled or cancelled.
The Manufacturer has to apply for periodical audits to verify the maintenance and application fo the quality system every 12 months.

Job Id: **344.1-009138-1**
Certificate No: **MEDD00001TR**

APPENDIX

Item no. MED/1.10 Buoyant smoke signals (pyrotechnics)

Type designation	EC Type-Examination Certificate No.	Expiry date	Notified Body No.	USCG approval number
IKAROS Buoyant Smoke Signal, Orange[1]	MEDB00005F2	2024-07-03	0575	160.122/EC0575/MEDB00005F2

Item no. MED/1.11 Line-throwing appliances (pyrotechnics)

Type designation	EC Type-Examination Certificate No.	Expiry date	Notified Body No.	USCG approval number
Ikaros line thrower[1]	MEDB00003R4	2023-10-28	0575	160.040/EC0575/MEDB00003R4

Item no. MED/1.2b Position indicating lights for lifebuoys

Type designation	EC Type-Examination Certificate No.	Expiry date	Notified Body No.	USCG approval number
Ikaros MOB Mk IV Light Signal[1]	MEDB000046Y Rev.1	2023-12-16	0575	161.110/EC0575/MEDB000046Y Rev.1

Item no. MED/1.3 Lifebuoys self-activating smoke signals

Type designation	EC Type-Examination Certificate No.	Expiry date	Notified Body No.	USCG approval number
Ikaros MOB IV smoke signal[1]	MEDB000046X	2023-12-16	0575	160.157/EC0575/MEDB000046X

Item no. MED/1.8 Rocket parachute flares (pyrotechnics)

Type designation	EC Type-Examination Certificate No.	Expiry date	Notified Body No.	USCG approval number
IKAROS Parachute Rocket, Red[1]	MEDB000053J	2024-07-03	0575	160.136/EC0575/MEDB000053J

Item no. MED/1.9 Hand flares (pyrotechnics)

Type designation	EC Type-Examination Certificate No.	Expiry date	Notified Body No.	USCG approval number
IKAROS Hand Flare, Red[1]	MEDB00005F3	2024-07-03	0575	160.121/EC0575/MEDB00005F3

DNV·GL

Certificate No:
TALB0000033

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Rocket parachute flares (pyrotechnics)

with type designation(s)
IKAROS Parachute Rocket, Red

Issued to
Hansson PyroTech AB

is found to comply with
SOLAS 74 as amended, LSA Code as amended. IMO Resolution MSC.81(70) as amended

Application :

Approved for use as Rocket parachute flares (pyrotechnics).

This certificate is recognized by Transport Canada.

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.

Issued at **Høvik** on **2019-07-04**

This Certificate is valid until **2024-07-03**.
DNV GL local station: **Sweden CMC**

Approval Engineer: **Jasna Jovovic-Lainis**

for **DNV GL**

Head of Section

Job Id: **262.1-031558-1**
Certificate No: **TALB0000033**

Product description

"IKAROS Parachute Rocket, Red"
rocket parachute flares ejecting a red flare on a parachute at 300 m altitude with burning time not less than 40 seconds and with average luminous intensity of minimum 30.000 candela.

Design weight: 400 ±5% g

Application/Limitation

Approved for use as Rocket parachute flares (pyrotechnics).

Acceptable lifetime: 4 years

Liferaft drop test has to be performed before installation on liferafts.

The design assessment is based on IMO Res. MSC.48(66) as amended by IMO Res. MSC.207(81) and IMO Res. MSC.218(82).

A statistically adequate sample of the production shall be tested in accordance with IMO Res. MSC.81(70), Part 2, Ch.4.

Type Approval documentation

Certification in accordance with Class Program DNVGL-CP-0338, September 2018.

The following documentation is basis for the DNV GL approval:

Documents	Date
Drawings as listed in "Document structure", No. DS 340100 Rev. 3	2019-02-01
Prototype test reports witnessed by Bureau Veritas	2015-03-31 & 2015-08-18 2013-10-03 2012-05-31 2011-08-18 2008-10-13~16 & 2008-11-07 2004-11-15

Tests carried out

Tests are documented in accordance with recommendation on testing of Lifesaving Appliances, IMO Res. MSC.81(70), Part 1, including IMO Res. MSC.200(80), IMO Res. MSC.226(82) and IMO Res. MSC.323(89).

Marking of product

The product is to be marked with name and address of manufacturer, type designation, date of manufacture, date of expiry and operational restrictions. The marking shall comply with the LSA Code (IMO Res. MSC.48(66)), item 1.2.2.9.

The product should be provided with brief instructions or diagrams clearly illustrating the use printed on the casing.

Transport Canada Approval

Based on the procedures laid down in the Transport Canada Publication entitled "Approval Procedures for Life Saving Equipment and Structural Fire Protection Products (TP 14612)", DNV GL confirms that the product/s listed in this certificate is/are in accordance with Transport Canada's requirements.

Transport Canada Application/Limitation

All of the required instructions and markings must be in both French and English.

Periodical assessment

DNV GL's surveyor is to be given permission to perform Periodical Assessments at any time during the validity of this certificate and at least every second year. The arrangement is to be in accordance with procedure described in Class Program DNVGL-CP-0338, Section 4.

Marine & Offshore Division

Certificate number: 06553/B1 BV
File number: PYR 2466/04
Product code: 6006H

This certificate is not valid when presented without the full attached schedule composed of 7 sections

TYPE APPROVAL CERTIFICATE

This certificate is issued to

Nammo LIAB AB

Lindesberg - SWEDEN

for the type of product

ROCKET PARACHUTE FLARES

IKAROS Parachute Rocket, Red
Article N° 340 100

Requirements:
Australian Standard AS 2092-2004

This certificate is issued to attest that BUREAU VERITAS did undertake the relevant approval procedures for the product identified above which was found to comply with the relevant requirements mentioned above.

This certificate will expire on: 28 Jul 2019

For BUREAU VERITAS,
At BV GOTHENBURG, on 12 Nov 2015,
Magne MOLLER

BUREAU VERITAS SURVEYORS AT PARIS 1828 GOTHENBURG INTERNATIONAL REGISTER

THE SCHEDULE OF APPROVAL

1. PRODUCT DESCRIPTION

Article N°	Trademark	Designation	Diameter	Overall length
340 100	Nammo LIAB AB	IKAROS Parachute Rocket, Red	50mm	278mm

2. DOCUMENTS AND DRAWINGS

- Drawings and specifications:

Number	Title	Revision	Date
DS 340100	Parachute Rocket, red	1	2015/10/15

- Manual(s) for installation use and maintenance.

No departure from these documents is permitted without the prior consent of the society.

3. TEST REPORTS

The product has been type tested by the manufacturer and witnessed by Bureau Veritas as per test reports listed :

DATE	TEST	
22& 29/03/1996	N° 341 100	Initial type tests
15/11/2004	---	Annual Tests 2004
21/12/2007	---	Annual Tests 2007
07/11/2008	---	Annual Tests 2008 - Taking into account the amended IMO resolutions
25/09/2009	SBTC 09-0646	Specific test - Australian standard
03/10/2013	---	Additional Type Tests (Annual Tests 2013)
02/04/2014	---	Additional Type Tests (Linked to annual Tests 2013)
30/05/2014	---	Additional Type Tests (Linked to annual Tests 2013)
18/08/2015	---	Additional Type Tests (2015)

4. APPLICATION / LIMITATION

- As per requirements of regulations stated on front page of this certificate.
- Each rocket parachute flare will be supplied with its instructions for use, inspections and on-board maintenance complying with Regulations stated on the front page of this certificate.
- The equipment shall be replaced prior the date of expiry which is marked in the signal casing (but not later than 3 years from the manufacture date).
- Shall be used as per Manufacturer's operational instructions.

5. PRODUCTION SURVEY REQUIREMENTS

The manufacturer shall institute a quality control procedure to ensure that the Rocket Parachute Flares are produced to the same standard as the approved prototype and shall keep records of any production tests carried out in accordance with AS 2092-2004.

The rocket parachute flares are to be supplied by **Nammo LIAB AB** in compliance with the type described in this certificate.
This type of product is within the category HBV of Bureau Veritas Rule Note NR320.
Nammo LIAB AB has to make the necessary arrangements to have its works recognised by Bureau Veritas in compliance with the requirements of NR320 for HBV products.

For information concerning the production phase modules, **Nammo LIAB AB** has declared the following manufacturing places:

Nammo LIAB AB

6. MARKING OF PRODUCT

Every item, or batch of items, to be affixed with the following marking:

- Identification of the type of signal
- Manufacturer name or logo
- Type designation
- Date of manufacture
- Date of expiry
- Batch number

Brief instructions or diagrams clearly illustrating the use of the product shall be printed indelibly on its casing;

7. OTHERS

This approval is given on the understanding that the Society reserves the right to require check tests to be carried out at any time and that the manufacturer will accept full responsibility for informing Shipowners of proper methods of use, storing and maintenance of Rocket Parachute Flares and the conditions of this approval.

This certificate supersedes the Type Approval Certificate No 06553/B0 BV issued on 28/07/2014 by the Society.

***** END OF CERTIFICATE *****

Marine & Offshore Division

Certificate number: 06553/D1 EC
File number: PYR 2466/04
Annex A1 Item number: A.1/1.8
USCG Module B number: 160.136 / EC0062

This certificate is not valid when presented without the full attached schedule composed of 7 sections

Notified Body 0062 - MARINE EQUIPMENT DIRECTIVE 96/98/EC

EC TYPE EXAMINATION CERTIFICATE

as per Module B of European Union Council Directive 96/98/EC on marine equipment as amended by Commission Directive 2014/93/EU

This certificate is issued to

Nammo LIAB AB

Lindesberg - SWEDEN

for the type of product

ROCKET PARACHUTE FLARES (PYROTECHNICS)

IKAROS Parachute Rocket, Red
Article N° 340 100

Requirements:
SOLAS 74 Convention as amended, Reg. III/4, III/6 ,III/34 and X/3,
IMO Res. MSC.36(63) -(1994 HSC Code)- as amended, 8
IMO Res. MSC.97(73) -(2000 HSC Code)- as amended, 8
IMO Res. MSC.48(66) -(LSA Code)- amended by MSC.207(81),MSC.218(82),MSC.272(85),MSC.293(87),MSC.320(89) &MSC.368(93), I , III
IMO Res. MSC.81(70) amended by MSC.200(80),MSC.226(82),MSC.274(85),MSC.295(87),MSC.321(89),MSC.323(89) &MSC.378(93)
IMO MSC/Circ. 980

This certificate is issued on behalf of the French Maritime Authorities to attest that BUREAU VERITAS did undertake the relevant type-examination procedures for the product identified above which was found to comply with the relevant requirements of the Council Directive 96/98/EC of 20 December 1996 as amended.

This certificate will expire on: 17 Jul 2019

For BUREAU VERITAS Notified Body 0062,

Magne MOLLER

BUREAU VERITAS SURVEYORS AT PARIS 1828 GOTHENBURG INTERNATIONAL REGISTER

This certificate does not allow to issue the Declaration of Conformity and to affix the mark of conformity (wheelmark ⚙) to the products corresponding to this type. To this end, the production-control phase module (D, E or F) of Annex B of the Directive is to be complied with and controlled by a written inspection agreement with a notified body.

This certificate remains valid until the date stated above, unless cancelled or revoked, provided the conditions indicated in the subsequent page(s) are complied with and the product remains satisfactory in service. This certificate will not be valid if the applicant makes any changes or modifications to the approved product, which have not been notified to, and agreed in writing with BUREAU VERITAS. Should the specified regulations or standards be amended during the validity of this certificate, the product(s) is/are to be re-approved prior to it/they being placed on board vessels to which the amended regulations or standards apply. BUREAU VERITAS is designated by the French Maritime Authority as a "notified body" under the terms of the French Regulations Division 140 Chapter 140-2. This certificate is issued within the scope of the General Conditions of BUREAU VERITAS Marine & Offshore Division available on the internet site. Any Person not a party to the contract pursuant to which this document is delivered may not assert a claim against BUREAU VERITAS for any liability arising out of errors or omissions which may be contained in said document, or for errors of judgement, fault or negligence committed by personnel of the Society or of its Agents in establishment or issuance of this document, and in connection with any activities for which it may provide.

THE SCHEDULE OF APPROVAL

1. PRODUCT DESCRIPTION

Article N°	Trademark	Designation	Diameter	Overall length
340 100	Nammo LIAB AB	IKAROS Parachute Rocket, Red	50mm	278mm

2. DOCUMENTS AND DRAWINGS

- Drawings and specifications:

Number	Title	Revision	Date
DS 340100	Parachute Rocket, Red	1	2015/10/15

- Manual(s) for installation use and maintenance.

No departure from these documents is permitted without the prior consent of the society.

3. TEST REPORTS

The product has been type tested by the manufacturer and witnessed by Bureau Veritas as per test reports listed :

DATE	TEST	
22& 29/03/1996	N° 341 100	Initial type tests
15/11/2004	---	Annual Tests 2004
21/12/2007	---	Annual Tests 2007
07/11/2008	---	Annual Tests 2008 - Taking into account the amended IMO resolutions
03/10/2013	---	Additional Type Tests (Annual Tests 2013)
02/04/2014	---	Additional Type Tests (Linked to annual Tests 2013)
30/05/2014	---	Additional Type Tests (Linked to annual Tests 2013)
18/08/2015	---	Additional Type Tests (2015)

4. APPLICATION / LIMITATION

- As per requirements of regulations stated on front page of this certificate.
- Each rocket parachute flare will be supplied with its instructions for use, inspections and on-board maintenance complying with Regulations stated on the front page of this certificate.
- Expiration date not to exceed 48 months after month of manufacture
- The equipment shall be replaced prior the date of expiry which is marked on the signal casing.
- Shall be used as per Manufacturer's operational instructions.

5. PRODUCTION SURVEY REQUIREMENTS

This certificate alone does not allow the applicant to issue the Declaration of Conformity and to affix the mark of conformity (wheelmark) to the products corresponding to this type. To this end, the production-control phase module D "Production Quality Assurance" or E "Product Quality Assurance" or F "Product Verification" of Annex B of the Directive is to be complied with and controlled by a written inspection agreement with a Notified Body.

The manufacturer shall institute a quality control procedure to ensure that the rocket parachute flares are produced to the same standard as the approved prototype and shall keep records of any production tests carried out in accordance with instructions given in IMO Resolution MSC.81 (70) Part 2.

Each equipment or batch of equipment is to be supplied with its manual(s) for installation, use and maintenance.

6. MARKING OF PRODUCT

Brief instructions or diagrams clearly illustrating the use of the rocket parachute flare shall be indelibly marked on the casing.

The signal body shall bear the following marks

- Manufacturer name or logo
- Trade name
- SOLAS approved.
- Lot number
- Means of determining its age or the date by which they must be replaced
- Markings as per MED 96/98/EC ¤ YYYY/XX where YYYY is the number of the Notified Body undertaking surveillance module (where BV, 0062) and XX are the last two digits of year mark affixed.

In pursuance of the EU/US MRA+, and in accordance with the Council Decision 2004/425/EC of 21 April 2004, the manufactured item(s) can be affixed with the USCG conformity marking, subject to the authorization of the Conformity Assessment Body undertaking surveillance module.

7. OTHERS

This approval is given on the understanding that the Society reserves the right to require check tests to be carried out at any time and that the manufacturer will accept full responsibility for informing Shipowners or their sub-contractors of the proper methods of use, storing and maintenance of the approved life-saving appliances and of the conditions of this approval.

This certificate supersedes the EC Type Examination Certificate No 06553/D0 EC issued on 17/07/2014 by the Society.

***** END OF CERTIFICATE *****

RUSSIAN MARITIME REGISTER OF SHIPPING

TYPE APPROVAL CERTIFICATE

Manufacturer *Nammo LIAB AB*

Product*

Rocket parachute flare

IKAROS Parachute Rocket, Red (Article No. 340100)

Code of nomenclature *03040000MK*

This is to certify that on the basis of the survey and tests carried out the above mentioned item(s) complies(ly) with the requirements of Russian Maritime Register of Shipping.

items 6.1, 6.7.1 of the part II of Rules for Equipment of Sea-going Ships, ed.2015. The product complies with the requirements of items 1.2, 3.1 of LSA Code (IMO Res. MSC.48(66) as amended by MSC.207(81), MSC.218(82)) and tested in accordance with recommendations of item 4 chapter I of IMO Resolution MSC.81(70) as amended.

This Type Approval Certificate is valid until *10.02.2020*

This Type Approval Certificate becomes invalid in cases stipulated in Rules for the Technical Supervision during Construction of Ships and Manufacture of Shipboard Materials and Products.

Date of issue *10.02.2015*

№ *15.10026.262*

Russian Maritime Register of Shipping L.S.

(signature) *R.Litvinets* (name)

* Additional information see overleaf.

Technical data

Flare colour - bright red.
Luminous intensity - not less than 30000 cd.
Duration of burning - not less than 40 s.
Flare ejection height - 350 m.
Rate of descent - not more than 5 m/s.
Weight - 345 g.
Length/Diameter - 277 mm / 47 mm.
The case is made of a water-resistant material.

Technical documentation and the date of its approval by Russian Maritime Register of Shipping

The set of technical documentation has been approved by letter No.262-381-121-32829 dd 26.01.2015.

Product's specimen has been tested under the technical supervision of Russian Maritime Register of Shipping.

Report No. ***15.00165.262*** of ***10.02.2015***

Application and limitations

It is applied as visual signals for supply sea-going ships.

The equipment shall be replaced prior to expiry of date marked on the case.

Type of document issued for product

The product shall be delivered with Russian Maritime Register of Shipping Certificate in accordance with form 6.5.30 / 6.5.31.