



Confirmation of Product Type Approval

Please refer to the "Service Restrictions" shown below to determine if Unit Certification is required for this product. This certificate reflects the information on the product in the ABS Records as of the date and time the certificate is printed.

Pursuant to the Rules of the American Bureau of Shipping (ABS), the manufacturer of the below listed product held a valid Manufacturing Assessment (MA) with expiration date of . The continued validity of the Manufacturing Assessment is dependent on completion of satisfactory audits as required by the ABS Rules.

And; a Product Design Assessment (PDA) valid until 08/SEP/2018 subject to continued compliance with the Rules or standards used in the evaluation of the product.

The above entitle the product to be called Product Type Approved.

The Product Design Assessment is valid for products intended for use on ABS classed vessels, MODUs or facilities which are in existence or under contract for construction on the date of the ABS Rules used to evaluate the Product.

ABS makes no representations regarding Type Approval of the Product for use on vessels, MODUs or facilities built after the date of the ABS Rules used for this evaluation.

Due to wide variety of specifications used in the products ABS has evaluated for Type Approval, it is part of our contract that; whether the standard is an ABS Rule or a non-ABS Rule, the Client has full responsibility for continued compliance with the standard.

Product Name: Flexible Hose

Model Name(s): Avenger HSPA / Avenger HSHA

Presented to:

RYCO HYDRAULICS (DALIAN) LTD. TAICANG BRANCH
2ND BUILDING NO. 88, DALIAN EAST ROAD
TAICANG ECONOMY DEVELOPING AREA
TAICANG CITY, JIANGSU PROVINCE CHINA
China

Intended Service:

For use on ships and offshore installations Classed with American Bureau of Shipping (ABS), as short lengths in fresh water, seawater, hydraulic, pneumatic, fuel oil and lube oil systems.

Description:

Flexible hoses of non-metallic material with permanently fitted couplings.

Ratings:

Avenger HSPA Temperature range: -40 degrees Celsius to +100 degrees Celsius
Model no. _ NB (inch) _ Max. Working Pressure (bar) HSP04A _ 1/4 _ 450 HSP06A
_ 3/8 _ 445 HSP08A _ 1/2 _ 420 HSP10A _ 5/8 _ 350 HSP12A _ 3/4 _ 350 HSP16A
_ 1 _ 350 Avenger HSHA Temperature range: -40 degrees Celsius to +100
degrees Celsius Model no. _ NB (inch) _ Max. Working Pressure (bar) HSH12A 3/4
435 HSH16A 1 420 HSH20A 1 1/4 350 HSH24A 1 1/2 290 HSH32A 2 275

Service Restrictions:

Unit Certification is not required for this product. If the manufacturer or purchaser request an ABS Certificate for compliance with a specification or standard, the specification or standard, including inspection standards and tolerances, must be clearly defined.

Comments:

The flexible hoses are to be installed in accordance with the manufacturer's procedures and tested to the satisfaction of the attending surveyors. Carbon steel couplings, used for temperatures below 60 degrees Celsius, are to be normalized. The flexible hoses have been tested for fire resistance as per ISO 15540 and ISO 15541. The flexible hoses have been type burst tested to not less than four times

its maximum allowable working pressure. Synthetic rubber hoses intended for use in bilge, ballast, compressed air, oil fuel, lubricating, hydraulic and thermal oil systems are to incorporate a single or double closely woven integral wire braid or other suitable material reinforcement. Synthetic rubber hoses intended for use in oil supply lines to burners, the hoses are to have external wire braid protection in addition to the integral reinforcement. To prevent danger of flooding due to failure of the hoses, the hoses in seawater systems are to be enclosed. In case of continuous operation at temperatures higher than 100 degrees Celsius, more frequent inspections and changes may be necessary. Hose clamps are not permitted except for cooling water systems for engines with a cylinder bore not exceeding 11.8inches (300mm).

Notes / Documentation:

This Product Design Assessment (PDA) is valid only for products intended for use on ABS classed vessels, MODUs or facilities which are in existence or under contract for construction on the date of the ABS Rules used to evaluate the Product.

Term of Validity:

This Product Design Assessment (PDA) Certificate 04-SG425051/2-PDA-DUP, dated 21/Apr/2016 remains valid until 08/Sep/2018 or until the Rules or specifications used in the assessment are revised (whichever occurs first). This PDA is intended for a product to be installed on an ABS classed vessel, MODU or facility which is in existence or under contract for construction on the date of the ABS Rules or specifications used to evaluate the Product. Use of the Product on an ABS classed vessel, MODU or facility which is contracted after the validity date of the ABS Rules and specifications used to evaluate the Product, will require re-evaluation of the PDA. Use of the Product for non ABS classed vessels, MODUs or facilities is to be to an agreement between the manufacturer and intended client.

ABS Rules:

ABS Rules for building and classing Steel Vessels 2013 4-6-2/5.7 ABS Rules for building and classing Mobile Offshore Drilling Units 2012 4-2-1/11.29

National Standards:**International Standards:****Government Authority:****EUMED:****Others:**

Model Certificate	Model Certificate No	Issue Date	Expiry Date
PDA-DUP	04-SG425051/2-PDA-DUP	21/APR/2016	08/SEP/2018



ABS Programs

ABS has used due diligence in the preparation of this certificate and it represents the information on the product in the ABS Records as of the date and time the certificate was printed. Type Approval requires Drawing Assessment, Prototype Testing and assessment of the manufacturer's quality assurance and quality control arrangements. Limited circumstances may allow only Prototype Testing to satisfy Type Approval. The approvals of Drawings and Products remain valid as long as the ABS Rule, to which they were assessed, remains valid. ABS cautions manufacturers to review and maintain compliance with all other specifications to which the product may have been assessed. Further, unless it is specifically indicated in the description of the product; Type Approval does not necessarily waive witnessed inspection or survey procedures (where otherwise required) for products to be used in a vessel, MODU or facility intended to be ABS classed or that is presently in class with ABS. Questions regarding the validity of ABS Rules or the need for supplemental testing or inspection of such products should, in all cases, be addressed to ABS.