



CERTIFICATE NUMBER
16-HS1462203-PDA

DATE
11 Jan 2016

ABS TECHNICAL OFFICE
Houston SED Machinery -
Equipment

CERTIFICATE OF DESIGN ASSESSMENT

This is to certify that a representative of this Bureau did, at the request of

TERRAGON ENVIRONMENTAL TECHNOLOGIES

assess design plans and data for the below listed product. This assessment is a representation by the Bureau as to the degree of compliance the design exhibits with applicable sections of the Rules. This assessment does not waive unit certification or classification procedures required by ABS Rules for products to be installed in ABS classed vessels or facilities. This certificate, by itself, does not reflect that the product is Type Approved. The scope and limitations of this assessment are detailed on the pages attached to this certificate.

Product: **Gasification System**

Model: **V8, MV8**

This Product Design Assessment (PDA) Certificate 16-HS1462203-PDA, dated 11/Jan/2016 remains valid until 10/Jan/2021 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.

AMERICAN BUREAU OF SHIPPING

Tim Kimble
Engineer/Consultant

NOTE: This certificate evidences compliance with one or more of the Rules, Guides, standards or other criteria of ABS or a statutory, industrial or manufacturer's standards. It is issued solely for the use of ABS, its committees, its clients or other authorized entities. Any significant changes to the aforementioned product without approval from ABS will result in this certificate becoming null and void. This certificate is governed by the terms and conditions as contained in ABS Rules 1-1-A.3.5.9 Terms and Conditions of the Request for Product Type Approval and Agreement (2010)

TERRAGON ENVIRONMENTAL TECHNOLOGIES

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Tier: 2 - PDA Issued

Product: Gasification System

Model: V8, MV8

Intended Service:

Marine and Offshore Applications - Transforming shipboard garbage and sludge oils into energy

Description:

Micro Auto Gasification System (MAGS)

Rating:

Solid Waste Throughput:

V8: 50kg/hr

MV8: 28 kg/hr

Sludge/Emulsified Oil Waste Throughput: 15 to 20 L/hr (3.97 - 5.28 Gal/hr);

Operating Temperature in Primary Gasifier: 600 °C;

Operating Temperature in Combustion Chamber: 1100 °C;

Exhaust Gas Temperature: 60 °C;

O₂ Avg. in Flue Gas: 9.8%;

CO Avg. in Flue Gas: 10.8 mg/MJ;

Soot Avg. Number: 1.15 bacharach scale.

Service Restriction:

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:

1. The Manufacturer has provided a declaration about the control of, or the lack of Asbestos in this product.
2. Unburnt residue (biochar) is to be disposed of ashore at a reconized reception facility.
3. A operation manual with drawings, electric diagrams, spare part list, etc. should be furnished with each unit installed onboard in accordance with Section 4 of the IMO Resolution MEPC 244(66).
4. The unit should have warning and instruction plates in a prominent location in accordance with Annex 1 of the IMO Resolution MEPC 244(66).

Notes/Drawing/Documentation:

Documentation:

Correspondence, New TA Application 02Dec2015, Revision: -, Pages: 1

Correspondence, Declaration of the Absence of Asbestos 02Dec2015, Revision: -, Pages: 1

Correspondence, Email, Revision: -, Pages: 1

MAGS V8 Specs Sheet Flyer, Revision: -, Pages 2

MAGS V8 Commissioning Checklist, Revision: -, Pages 4

V8 & MV8 Testing Documentation, Revision:-, Pages 20

Drawings:

Drawing No. MAGS V8 General Assembly, Revision: -, Pages: 1

Drawing No. MAGS 815 Installation Specifications, Revision: -, Pages: 13

Drawing No. MAGS V8 P&ID, Revision: -, Pages: 1

Drawing No. MAGS 8.00014 CAB-1, Revision: -, Pages: 20

Drawing No. MAGS 8.00014 CAB-1 Layout, Revision: -, Pages: 5

Drawing No. MAGS 8.00014 CAB-2, Revision: -, Pages: 3

Drawing No. MAGS 8.00014 CAB-2 Layout, Revision: -, Pages: 4

Drawing No. MAGS 8.00014 CAB-3, Revision: -, Pages: 4

Drawing No. MAGS 8.00014 CAB-3 Layout, Revision: -, Pages: 4

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Drawing No. MAGS 8.00014 CAB General Layout, Revision: -, Pages: 5

Terms of Validity:

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STANDARDS

ABS Rules:

Rules for Conditions of Classification, Part 1 - 2016 Steel Vessels Rules 1-1-4/7.7, 1-1-A3, 1-1-A4, which covers the following:

Steel Vessels (2016): 4-8-2, 4-8-3, and 4-4-1/15;

National:

NA

International:

IMO Resolution MEPC.244(66) adopted on 4 April 2014; standard specification for Shipboard Incinerators.

Government:

NA

EUMED:

NA

OTHERS:

NA