CERTIFICATE NUMBER
14-PR1284959-PDA

DATE
08 Dec 2014

ABS TECHNICAL OFFICE
Piraeus Engineering Department

CERTIFICATE OF DESIGN ASSESSMENT

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

COBALT BLUE MONOPROSOPI EPE

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: **Non-Metallic Flexible Hose Assemblies**

Model: **Type 1 2SN and 2ST connectors Type 3 1ST and 1SN connectors**

This Product Design Assessment (PDA) Certificate 14-PR1284959-PDA, dated 08/Dec/2014 remains valid until 09/Dec/2019 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

I Koumbarelis

Ion G. Koumbarelis
Engineer

ABS PIRAEUS

AMERICAN BUREAU OF SHIPPING

Customer Name	**COBALT BLUE MONOPROSOPI EPE**	Purchase Order No.	**EMAIL DATED 21-OCT-2014**
Attending Office	**Piraeus**	Report Number	**PR2751953**
First Visit Date	**30-Oct-2014**	Last Visit Date	**02-Dec-2014**

Certification Of: Flexible Hose — Quantity: One (1)
Manufacturer: COBALT BLUE MONOPROSOPI EPE

Survey Location : KERATSINI, GREECE

Equipment Data

Item Name	Flexible Hoses for CO2 system-Type 1 connector-Kawasaki Type
Model Number	SAE 100 R2A-EN853 2ST and SAE 100 R2AT-EN853 2SN

Additional Data

Diameter	12.7 mm
Maximum Allowable Working Pressure	275 bar

This is to Certify that the undersigned surveyor(s) to this Bureau did, at the request of the customer, carry out the following survey and report as follows:

Traceability of materials used on this project has been verified.
The principal data has been verified in accordance with the applicable Rules/specifications and approved plans, and confirmed to be within acceptable tolerances.
All testing (pressure/load/operational/etc.) has been carried out as applicable and verified in accordance with the applicable Rules/specifications.
Testing machines are maintained in a satisfactory condition and records of their recheck or calibration dates confirmed.
Asbestos-free declaration verified and supporting documentation reviewed.

At the request of Cobalt Blue Ltd the undersigned surveyor witnessed on the 30th day of October 2014 and subsequent dates at Geniki Ydrayliki premises
Leoforos Dimokratias 108A- Keratsini, Greece, tests in accordance with BS EN 12094-8:2006 for the purposes of Product Design Assessment of flexible hoses together with fittings intended for high-pressure fixed CO2 systems.

Type: Type 1 connector, Kawasaki type, SAE 100 R2A-EN853 2ST and SAE 100 R2AT-EN853 2SN.
Fittings: Both sides: Female swivel 3/4 inch NPSM - Material: Steel chromated.
Inner Diameter: 12.7 mm
Maximum Allowable Working Pressure: 275 bar

Test procedure:

Resistance to leakage: Three (3) samples were pressurized up to 210 bar. After 10 minutes, pressure was released and upon examination the samples did not show any leakage, deformation or alteration of any kind.
Resistance to bursting: Three (3) samples were pressurized up to 420 bar. After 10 minutes, pressure was released and upon examination the samples did not show any leakage, deformation or alteration of any kind.
Resistance to cold: Three (3) samples were kept at steady temperature of -20 degrees Celsius for four (4) hours. After that period of time, samples were bent to minimum radius and maximum angle of deflection as specified by the manufacturer. Upon examination, the samples

Customer Name	**COBALT BLUE MONOPROSOPI EPE**	Purchase Order No.	**EMAIL DATED 21-OCT-2014**
Attending Office	**Piraeus**	Report Number	**PR2751953**
First Visit Date	**30-Oct-2014**	Last Visit Date	**02-Dec-2014**

did not show any sign of deterioration, damage or alteration.

Markings: It was verified that markings of the hoses are in compliance with BS EN 12094-8:2006 paragraph 6.

Sequence of testing: Sequence of tests was in compliance with BS EN 12094-8:2006 par. 5.2 Table 3.

Note: Flexible hoses are covered by ABS Confirmation of Product Type Approval No. 04-GE430135-4-PDA dated 09-FEB-2012.

AMERICAN BUREAU OF SHIPPING

Customer Name	**COBALT BLUE MONOPROSOPI EPE**	Purchase Order No.	**EMAIL DATED 21-OCT-2014**
Attending Office	**Piraeus**	Report Number	**PR2751953**
First Visit Date	**30-Oct-2014**	Last Visit Date	**02-Dec-2014**

Certification Of: Flexible Hose — Quantity: One (1)
Manufacturer: COBALT BLUE MONOPROSOPI EPE

Survey Location : KERATSINI, GREECE

Equipment Data

Item Name	Flexible Hoses for CO2 system-Type 1 connector-NK Type
Model Number	SAE 100 R2A-EN853 2ST and SAE 100 R2AT-EN853 2SN

Additional Data

Diameter	12.7 mm
Maximum Allowable Working Pressure	275 bar

This is to Certify that the undersigned surveyor(s) to this Bureau did, at the request of the customer, carry out the following survey and report as follows:

Traceability of materials used on this project has been verified.
The principal data has been verified in accordance with the applicable Rules/specifications and approved plans, and confirmed to be within acceptable tolerances.
All testing (pressure/load/operational/etc.) has been carried out as applicable and verified in accordance with the applicable Rules/specifications.
Testing machines are maintained in a satisfactory condition and records of their recheck or calibration dates confirmed.
Asbestos-free declaration verified and supporting documentation reviewed.

At the request of Cobalt Blue Ltd the undersigned surveyor witnessed on the 30th day of October 2014 and subsequent dates at Geniki Ydrayliki premises Leoforos Dimokratias 108A- Keratsini, Greece, tests in accordance with BS EN 12094-8:2006 for the purposes of Product Design Assessment of flexible hoses together with fittings intended for high-pressure fixed CO2 systems.

Type: Type 1 connector, NK type, SAE 100 R2A-EN853 2ST and SAE 100 R2AT-EN853 2SN.
Fittings: Both sides: Female swivel W21.8x14 TPI DIN 477 with copper gasket - Material: Steel chromated.
Inner Diameter: 12.7 mm
Maximum Allowable Working Pressure: 275 bar

Test procedure:

Resistance to leakage: Three (3) samples were pressurized up to 210 bar. After 10 minutes, pressure was released and upon examination the samples did not show any leakage, deformation or alteration of any kind.
Resistance to bursting: Three (3) samples were pressurized up to 420 bar. After 10 minutes, pressure was released and upon examination the samples did not show any leakage, deformation or alteration of any kind.
Resistance to cold: Three (3) samples were kept at steady temperature of -20 degrees Celsius for four (4) hours. After that period of time, samples were bent to minimum radius and maximum angle of deflection as specified by the manufacturer. Upon examination, the samples did not show any sign of deterioration, damage or alteration.

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Attending Office	**Piraeus**	Report Number	**PR2751953**
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Markings: It was verified that markings of the hoses are in compliance with BS EN 12094-8:2006 paragraph 6.

Sequence of testing: Sequence of tests was in compliance with BS EN 12094-8:2006 par. 5.2 Table 3.

Note: Flexible hoses are covered by ABS Confirmation of Product Type Approval No. 04-GE430135-4-PDA dated 09-FEB-2012.

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Customer Name	**COBALT BLUE MONOPROSOPI EPE**	Purchase Order No.	**EMAIL DATED 21-OCT-2014**
Attending Office	**Piraeus**	Report Number	**PR2751953**
First Visit Date	**30-Oct-2014**	Last Visit Date	**02-Dec-2014**

Certification Of: Flexible Hose — Quantity: One (1)
Manufacturer: COBALT BLUE MONOPROSOPI EPE

Survey Location : KERATSINI, GREECE

Equipment Data

Item Name	Flexible Hoses for CO2 system-Type 1 connector-Unitor Type
Model Number	SAE 100 R2A-EN853 2ST and SAE 100 R2AT-EN853 2SN

Additional Data

Diameter	12.7 mm
Maximum Allowable Working Pressure	275 bar

This is to Certify that the undersigned surveyor(s) to this Bureau did, at the request of the customer, carry out the following survey and report as follows:

Traceability of materials used on this project has been verified.
The principal data has been verified in accordance with the applicable Rules/specifications and approved plans, and confirmed to be within acceptable tolerances.
All testing (pressure/load/operational/etc.) has been carried out as applicable and verified in accordance with the applicable Rules/specifications.
Testing machines are maintained in a satisfactory condition and records of their recheck or calibration dates confirmed.
Asbestos-free declaration verified and supporting documentation reviewed.

At the request of Cobalt Blue Ltd the undersigned surveyor witnessed on the 30th day of October 2014 and subsequent dates at Geniki Ydrayliki premises Leoforos Dimokratias 108A- Keratsini, Greece, tests in accordance with BS EN 12094-8:2006 for the purposes of Product Design Assessment of flexible hoses together with fittings intended for high-pressure fixed CO2 systems.

Type: Type 1 connector, Unitor type, SAE 100 R2A-EN853 2ST and SAE 100 R2AT-EN853 2SN.
Fittings: One side: Female swivel W21.8x14 TPI DIN 477 with copper gasket-Other Side: Fixed Male inch BSP with cutting edge.
Material of fittings: Steel chromated.
Inner Diameter: 12.7 mm
Maximum Allowable Working Pressure: 275 bar

Test procedure:

Resistance to leakage: Three (3) samples were pressurized up to 210 bar. After 10 minutes, pressure was released and upon examination the samples did not show any leakage, deformation or alteration of any kind.
Resistance to bursting: Three (3) samples were pressurized up to 420 bar. After 10 minutes, pressure was released and upon examination the samples did not show any leakage, deformation or alteration of any kind.
Resistance to cold: Three (3) samples were kept at steady temperature of -20 degrees Celsius for four (4) hours. After that period of time, samples were bent to minimum radius and maximum angle of deflection as specified by the manufacturer. Upon examination, the samples

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did not show any sign of deterioration, damage or alteration.

Markings: It was verified that markings of the hoses are in compliance with BS EN 12094-8:2006 paragraph 6.
Sequence of testing: Sequence of tests was in compliance with BS EN 12094-8:2006 par. 5.2 Table 3.
Note: Flexible hoses are covered by ABS Confirmation of Product Type Approval No. 04-GE430135-4-PDA dated 09-FEB-2012.

Surveyor(s) to The American Bureau of Shipping
Attending Surveyors

Moschouris Sotiris — Electronically Signed on 02-Dec-2014 by Mylonas, Alexandros

Mylonas Alexandros — Electronically Signed on 02-Dec-2014

ABS PIRAEUS

Reviewed By
Revezikas, George — Electronically Signed on 03-Dec-2014, Piraeus Port

COPY

AMERICAN BUREAU OF SHIPPING

Customer Name	**COBALT BLUE MONOPROSOPI EPE**	Purchase Order No.	**EMAIL DATED 21-OCT-2014**
Attending Office	**Piraeus**	Report Number	**PR2751953**
First Visit Date	**30-Oct-2014**	Last Visit Date	**02-Dec-2014**

Certification Of: Flexible Hose — Quantity: One (1)
Manufacturer: COBALT BLUE MONOPROSOPI EPE

Survey Location : KERATSINI, GREECE

Equipment Data

Item Name	Flexible Hoses for CO2 system-Type 3 connector-Unitor Type
Model Number	Type SAE 100 R1A-EN853 1 ST and SAE 100 R1AT-EN85 1SN

Additional Data

Diameter	6.4 mm
Maximum Allowable Working Pressure	225 bar

This is to Certify that the undersigned surveyor(s) to this Bureau did, at the request of the customer, carry out the following survey and report as follows:

Traceability of materials used on this project has been verified.
The principal data has been verified in accordance with the applicable Rules/specifications and approved plans, and confirmed to be within acceptable tolerances.
All testing (pressure/load/operational/etc.) has been carried out as applicable and verified in accordance with the applicable Rules/specifications.
Testing machines are maintained in a satisfactory condition and records of their recheck or calibration dates confirmed.
Asbestos-free declaration verified and supporting documentation reviewed.

At the request of Cobalt Blue Ltd the undersigned surveyor witnessed on the 30th day of October 2014 and subsequent dates at Geniki Ydrayliki premises
Leoforos Dimokratias 108A- Keratsini, Greece, tests in accordance with BS EN 12094-8:2006 for the purposes of Product Design Assessment of flexible hoses together with fittings intended for high-pressure fixed CO2 systems.

Type: Type 3 connector, Unitor type, SAE 100 R2A-EN853 2ST and SAE 100 R2AT-EN853 2SN.
Fittings: Male Swivel 3/8 BSP with cutting edge- Material: Steel chromated.
Inner Diameter: 6.4 mm
Maximum Allowable Working Pressure: 225 bar

Test procedure:

Resistance to leakage: Three (3) samples were pressurized up to 337.5 bar. After 10 minutes, pressure was released and upon examination the samples did not show any leakage, deformation or alteration of any kind.
Resistance to bursting: Three (3) samples were pressurized up to 675 bar. After 10 minutes, pressure was released and upon examination the samples did not show any leakage, deformation or alteration of any kind.
Resistance to cold: Three (3) samples were kept at steady temperature of -20 degrees Celsius for four (4) hours. After that period of time, samples were bent to minimum radius and maximum angle of deflection as specified by the manufacturer. Upon examination, the samples

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did not show any sign of deterioration, damage or alteration.

Markings: It was verified that markings of the hoses are in compliance with BS EN 12094-8:2006 paragraph 6.
Sequence of testing: Sequence of tests was in compliance with BS EN 12094-8:2006 par. 5.2 Table 3.
Note: Flexible hoses are covered by ABS Confirmation of Product Type Approval No. 04-GE430135-4-PDA dated 09-FEB-2012.