

# TYPE APPROVAL CERTIFICATE

**This is to certify:****That the Plastic Pipes, Fibre Reinforced Thermosetting**with type designation(s)  
**MY-MOS16/16C - Marine-Offshore GRE Piping System**

Issued to

**Suzhou City Muye Shipping Equipment Co., Ltd.**  
**Suzhou City, China**

is found to comply with

**DNV GL rules for classification – Ships****DNV GL class programme DNVGL-CP-0070 – Type approval – Fibre reinforced thermosetting plastic piping systems****DNV GL offshore standards****Application :****Products approved by this certificate are accepted for installation on all vessels classed by DNV GL.**Issued at **Hamburg** on **2017-08-24**This Certificate is valid until **2022-08-23**.DNV GL local station: **Shanghai**for **DNV GL**Approval Engineer: **Hagen Markus**

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**Olaf Drews**  
**Head of Section**

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid. The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.



## Product description

Filament Wound Fibre Reinforced Thermosetting Epoxy Resin Pipe and Fittings,  
Conductive and Non-Conductive.

## Design Types, Size and pressure range

| Piping System | Resin System | Product Name                  | Size range        | Nominal Internal Pressure<br>PN <sub>i</sub> | Nominal External Pressure <sup>2,3</sup><br>PN <sub>e</sub> | Fire Endurance Level | Conductivity   |
|---------------|--------------|-------------------------------|-------------------|----------------------------------------------|-------------------------------------------------------------|----------------------|----------------|
| MY-MOS16      | Epoxy        | Piping & Fitting <sup>1</sup> | DN 40 up to DN600 | 16                                           | 3.8                                                         | Level 3              | Non-conductive |
| MY-MOS16C     |              |                               |                   |                                              |                                                             |                      | Conductive     |

### Notes

<sup>1</sup> Resin liner of 0.50 mm

<sup>2</sup> External pressure resistance at full vacuum inside the pipe 2.8bar. Collapse pressure > 11.4bar

<sup>3</sup> Reduction of external pressure for service or environmental temperature above 60°C may have to be observed.

## Pipe wall thickness

Minimum structural wall thickness (excluding internal liner 0.5)

| DN  | MY-MOS16/16C<br>[mm] |
|-----|----------------------|
| 40  | 5.0                  |
| 50  | 3.8                  |
| 65  | 3.8                  |
| 80  | 3.8                  |
| 100 | 3.8                  |
| 125 | 4.10                 |
| 150 | 4.90                 |
| 200 | 6.30                 |
| 250 | 8.00                 |
| 300 | 9.50                 |
| 350 | 10.90                |
| 400 | 11.90                |
| 450 | 13.20                |
| 500 | 14.60                |
| 550 | 16.00                |
| 600 | 17.00                |

## Standard fittings

Equal Tee, Red-Tee, Red-Con, Red-Ecc, Elbow, Coupling, Blank Saddle, Bell Mouth, Grounding Saddle, Flanges.

Additional fittings may be used by following the minimum structural wall thicknesses as specified for the standard fittings.

## Joining methods

|                         |                   |
|-------------------------|-------------------|
| Socket / Taper bonding  | DN40 up to DN150  |
| Taper bonding           | DN200 up to DN600 |
| Double O-Ring Expansion | DN50 up to DN600  |
| Flange connection       | DN40 up to DN600  |

### Application/Limitation

The MY-MOS16/16C GRE piping system is type approved for application in piping systems as listed in "Table 1- Fire endurance requirements matrix" of DNV GL Rules Pt.4, Ch.6, Section 2

For installation on offshore units refer to DNV GL - OS-D101, Ch.2, Section2 "Table 3 Fire endurance requirements matrix".

Approved installation locations where "0" or "L3" is specified. Appropriate footnotes are to be observed. For installation on offshore units the requirements specified in the DNV GL offshore standards (OS), applicable to the individual project, are to be observed.

### Maximum internal operating pressure

| Media temperature     | MY-MOS16/16C |
|-----------------------|--------------|
| from -50°C up to 60°C | 16           |
| Up to 70°C            | 15           |
| Up to 80°C            | 13.5         |
| Up to 90°C            | 11           |
| Up to 93°C            | 9.5          |

### Production Testing

Each batch shall be subjected to product tests according to Inspection and Testing Plan – ITP-MY-MOS16/16C-001,Rev.02 dated 2017-06-21.

### Extent of Type Tests applicable to piping system dependent on application

#### Fire endurance Level

Fire Endurance Level 3, including external pressure test, according to IMO Resolution A.753 (18), Appendix 2.

#### Sizes and type of connection

| Type of connection                                                       | Size range         |
|--------------------------------------------------------------------------|--------------------|
| MY-MOS16/16C Adhesive bonding and coupling.                              | DN40 up to DN600   |
| MY-MOS16/16C DOM&DOM/K in combination with MY-MOS16/16C Expansion Sleeve | >DN150 up to DN600 |

#### Flame spread

Surface flame spread characteristics have been determined by FTP Code:2010, Appendix1, Part5.

#### Smoke and toxicity

The MY-MOS16 piping system is tested with respect to smoke and toxicity characteristics as specified in FTP Code:2010, Appendix1, Part2.

#### Electrical conductivity

The MY-MOS16 system non-conductive is limited for installation in non-gas hazardous areas where as the MY-MOS16C conductive piping system is approved for installation in gas hazardous areas. Conductivity test is to be carried out after installation of piping system on board ship.

### **Installation on Passenger vessels**

For application on passenger vessels additional requirements specified in the Rules and Regulations of the appropriate flag state authority may have to be observed.

### **Design and Installation of piping systems**

For the design and installation of piping systems the following documents, issued by Suzhou City MUYI Shipping Equipment Co., Ltd., are to be observed:

- Installation Handbook for MY-MOS 16&16C Marine-Offshore GRE Pipe
- Product Manual
- Installation Manual

In addition the installation requirements specific to the ship of offshore structure as well as specified by the IMO 753-(18) are to be observed.

### **Bulkhead penetration**

In case of plastic pipes pass through watertight bulkheads or decks, the watertight integrity of the bulkhead or deck is to be maintained.

On passenger vessels, where the watertight bulkhead is also a fire division, the requirements of the SOLAS Chapter II - 1, Regulation 13.2.3. are to be observed.

### **Type Approval documentation**

### **Type tests**

## Marking of product

To ensure traceability from the final product to this type approval certificate each pipe or pipe spool is to be marked at least with:

|                                      |          | Example       |
|--------------------------------------|----------|---------------|
| Manufacturer's name and / or logo    |          | MYSEC         |
| Type designation                     |          |               |
| Non-conductive                       |          | MY-MOS16      |
| Conductive                           |          | MY-MOS16C     |
| Size / dimensions                    |          | DN200         |
| Type of joining method (pipe spools) |          |               |
| Socket / Taper bonding               |          | S / T         |
| Taper bonding                        |          | T             |
| Double O-Ring Expansion              |          | DOE           |
| Nominal design pressure              | internal | PNi16         |
|                                      | external | PNe3.8        |
| M.A.W.T.                             |          | 93°C          |
| M.A.W.P.                             |          | 9.5 bar       |
| Serial number                        |          | 170812 FA0101 |

Labels with the following text shall be attached to flanges which shall be joined by bolting:  
"APPLY BOLTING TORQUE ACCORDING TO MANUFACTURER'S RECOMMENDATION".

## Periodical assessment

For retention of the type approval certificate periodical assessments shall be carried out at production places by DNVGL surveyor.

The objective of the periodical assessment is to verify that the design and production conditions for the type approval have not been altered.

Main scope of the assessment:

- verification of the production and quality control system
- review of quality control documentation of recent deliveries
- review of drawings in production to verify any design changes which may have an impact on data specified in the type approval certificate, performance and range of application
- verification of the product marking

Periodical assessment is to be performed after 2 years and after 3.5 years. A renewal assessment will be performed at renewal of the certificate.