



BIRO KLASIFIKASI INDONESIA

SERTIFIKAT PERSETUJUAN TIPE

Type Approval Certificate

No. 05.17.SP0183

No. Persetujuan : 16TA090
No. approval

Tanggal persetujuan : 20 June 2016
Date of approval

Dengan ini dinyatakan bahwa produk dibawah ini telah memenuhi dan disetujui
This is to certify that the following products has been complied and approved

berdasarkan persyaratan dari Peraturan dan/atau Standard yang tercantum dibawah ini
in accordance with requirements of the Rules and / or Standards listed below

Produk : **MASS PRODUCED DIESEL ENGINE FOR MARINE APPLICATION**
Product

Pembuat : **FPT INDUSTRIAL S.p.A**
Manufacturer
Plant 1 : Strada delle Cascinette 424/34, Torino, Italy
Plant 2 : Pregnana Milanese, Via Vanzago, Milan Italy

Tipe produk : **N 45/67**
Type designation

Standard persetujuan :
Approval standards

BKI Rules for Approval of Manufacturers and Service Suppliers, Part 1 Vol. XI
BKI Rules for Machinery Installation, Part 1 Vol. III

Sertifikat ini berlaku hingga tanggal yang ditetapkan di bawah dengan syarat pemeriksaan periodik
This certificate remains valid until the date set below provided that periodical surveillances

dilakukan tepat waktu dan setiap perubahan atau modifikasi pada produk diberitahukan ke BKI.
are carried out on time and any alterations or modifications to the approved product notified to BKI.

Sertifikat ini berlaku sampai dengan : **19 June 2021**
This certificate is valid until

Jakarta, 3 March 2017

a.n. Direksi
Direktur Klasifikasi
o.b. Board of Director
Director of Classification

Capt. Iman Satria Utama

Sertifikat ini diterbitkan untuk menggantikan Sertifikat No. 101.16.SP0254 yang dinyatakan tidak berlaku lagi dikarenakan penambahan informasi data daya mesin pada kondisi persetujuan.
This certificate is issued to replace Certificate No. 101.16.SP0254 which is no longer valid due to addition of information in engine rated power in Condition of Approval.

- Jika Peraturan atau Standard yang digunakan mengalami perubahan pada saat sertifikat ini masih berlaku, maka produk harus dilakukan persetujuan ulang sebelum dipasang dikapal yang menerapkan Peraturan atau Standard tersebut.
Should the specified Rules or Standards be amended during the validity of this certificate, the product is to be reapproved prior to it being placed on board vessels to which the amended Rules or Standards apply.

Ketentuan Persetujuan Approval Condition

Deskripsi Produk

Product Description

Four Stroke Diesel Engine

Cylinder Arrangement	: In Line
Cylinder Bore	: 104 mm
Piston Stroke	: 132 mm
Direction of Rotation	: Counterclockwise
Injection Operation	: Mechanical by Cams

Kondisi Persetujuan

Condition of Approval

- The Approval are given for the mass produced engine for propulsion, auxiliary and emergency duty based on the following main data:

N45 MNAM10

Number of Cylinder : 4 Cylinder

Aspiration Method : Natural Aspirated

Engine Rating	Rated Power (kW)	Rated Speed (rpm)	Mean Effective Pressure (bar)	Application Limitation
F4GE0406D*E	61,4	2800	5,99	Heavy Duty (D)
F4GE0406C*E	62,5	2800	6,07	Medium Duty (C)
F4GE0406B*E	66,2	2800	6,43	Light Duty (B)
F4GE0406A*E	73,5	2800	7,14	High Performance Craft (A1)

N67 MNAM15

Number of Cylinder : 6 Cylinder

Aspiration Method : Natural Aspirated

Engine Rating	Rated Power (kW)	Rated Speed (rpm)	Mean Effective Pressure (bar)	Application Limitation
F4GE0606F*E	80	2300	6,35	Heavy Duty (D)
F4GE0606E*E	80	2100	6,93	Heavy Duty (D)
F4GE0606D*E	85	2800	5,52	Heavy Duty (D)
F4GE0606C*E	92	2800	5,97	Heavy Duty (D)
F4GE0606B*E	99,5	2800	6,46	Light Duty (B)
F4GE0606A*E	110	2800	7,16	High Performance Craft (A1)

N67 MNSM22

Number of Cylinder : 6 Cylinder

Aspiration Method : Turbocharged

Engine Rating	Rated Power (kW)	Rated Speed (rpm)	Mean Effective Pressure (bar)	Application Limitation
F4GE0656D*E	110	2800	7,14	Heavy Duty (D)
F4GE0656B*E	132	2300	10,44	Medium Duty (C)
F4GE0656E*A	147	2800	9,6	Light Duty (B)
F4GE0656A*E	162	2800	10,52	High Performance Craft (A1)

N67 MNTM28

Number of Cylinder : 6 Cylinder

Aspiration Method : Turbocharged Intercooled

Engine Rating	Rated Power (kW)	Rated Speed (rpm)	Mean Effective Pressure (bar)	Application Limitation
F4GE0686D*E	132	2500	9,42	Heavy Duty (D)
F4GE0686C*E	170	2800	10,83	Medium Duty (C)
F4GE0686B*E	191	2800	12,17	Light Duty (B)
F4GE0686A*E	206	2800	13,13	High Performance Craft (A1)

Application Limitation definition:

- A1 defined as intermittent rating where the full throttle operation restricted within 10% of total use period. Cruising speed at engine rpm <90% of rated speed. Maximum usage 300 hours per year.
- B defined as intermittent rating where the full throttle operation restricted within 10% of use period. Cruising speed at engine rpm <90% of rated speed. Maximum usage 1500 hours per year.
- C defined as intermittent rating where the full throttle operation restricted within 25% of use period. Cruising speed at engine rpm <90% of rated speed. Maximum usage 3000 hours per year.
- D defined as maximum continuous rating where the maximum rating utilization up to 100% of use period, for unlimited hours per year.

2. Intermittent Rating only applies to the engine intended for special applications under operation instruction of the engine manufacturer.
3. Minimum tensile strength of crankshaft material is 800 N/mm²
4. Test and final inspection of each engine shall be carried out in accordance with BKI Rules for Machinery Installation, Part 1 Vol. III Section 2. E.5. and BKI Rules for Approval of Manufacturers and Service Suppliers, Part 1 Vol. XI Section 2, D.2.
5. The manufacturer issues Test Report upon successful testing of each engine which obtain validity only after endorsement and registration by BKI.
6. The spare part are to be furnished in accordance with the Rules applicable to the vessel in which the engine is installed.
7. Individual product certification is required.

Dokumentasi Persetujuan Tipe

Type Approval Documentation

1. List of drawing as BKI contract no 16TA090.
2. ISO 9001:2008 Quality Management System compliance No. A10372/04/S
3. Engine manufacturer quality plan VA.GQ-006
4. Material of component quality plan VA.GQ-013
5. N67MNSM22 Engine Type Test Report No. 2005CS01995
6. N67MNTM28 Engine Type Test Report No. 2003-CS-01-4916
7. Engine test bench report taken from engine serial number 1415492

Penandaan Produk

Marking of Product

The product is to be marked with manufacturer's name or trademark, serial number, the last date of examination and the BKI's identification number and stamp.

Pemeriksaan periodik

Periodical Surveillance

For retention of the Type Approval, a BKI Surveyor shall carried out periodical surveillance every year to verify that approved documentation, etc. and quality system of the manufacturing works are maintained satisfactory and the condition of the type approval are complied with.

The objective of the Periodical Assessment is to verify that the condition for the Type Approval are not altered since the Type approval certificate was issued. The main scope of the Periodical Assessment will normally include:

- Verification of the manufacturer's production and quality system with regard to ensure continued consistent production of the Type Approved products at the manufacturer's premises and at other companies that are given the responsibility for manufacturing of the product.
- Review of the Type Approval documentation and that this is still used as basis for the production.
- Review of possible changes to the design, material and performance of the product
- Verification of the product marking.

Lembar Pengukuhan
*Endorsement Sheet*Harus dikukuhkan oleh Surveyor BKI
To be endorsed by BKI Surveyor

Pemeriksaan tahunan pertama (19 Maret 2017 – 19 Sept. 2017) <i>First annual inspection (19 March 2017 – 19 September 2017)</i> No. Laporan : <i>Report no.</i>	Tanggal : <i>Date</i> Surveyor :
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