DNV·GL

TYPE APPROVAL CERTIFICATE

Certificate No:
TAM00000WG

This is to certify:

That the Diesel Engine

with type designations
AD/V 158, 180 and 222

Issued to
Doosan Infracore Co., Ltd.
Incheon, Republic of Korea

is found to comply with
DNV GL Rules for classification, Ships - DNVGL-RU-SHIP-Pt4 Ch3 Sec1, Reciprocating Internal Combustion Engines

Application :

Propulsion / auxiliary / emergency

Products approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.

This Certificate is valid until **30th June, 2023**.

Issued at **Høvik** on **14th May, 2018**
DNV GL local station: **Seoul** for **DNV GL**

Approval Engineer: **Dag Harald Williksen**

Oddvar Deinboll
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.

Job Id: **262.1-001250-5**
Certificate No: **TAM00000WG**

Product description

Four stroke, v-engine, non-reversible, trunk-piston, direct injection, injection operation by cams, valve operation by cams, liquid fuel

Cylinder bore [mm]	128
Piston stroke [mm]	142
No. of cylinders	8, 10 and 12 in-V

Application/Limitation

Engine model	V158TIH	V158TIM	V158TIL	AD158TIF	AD158TIS
Mean eff. pressure, [bar]	16.1	15.5	17.8	16.5	16.1
Max. cyl. pressure, [bar]	120	125	135	115	120
Rated cont. output, [kW]	353	397	500	302	353
Corresponding to, [rpm]	1800	2100	2300	1500	1800

Engine model	V180TIH	V180TIM	V180TIL	AD180TIF	AD180TIS
Mean eff. pressure, [bar]	16.1	14.9	17.2	15.6	16.1
Max. cyl. pressure, [bar]	125	130	140	115	130
Rated cont. output, [kW]	441	478	603	357	441
Corresponding to, [rpm]	1800	2100	2300	1500	1800

Engine model	V222TIH	V222TIM	V222TIL	AD222TIF	AD222TIS
Mean eff. pressure, [bar]	16.1	15.3	17.5	16.3	16.1
Max. cyl. pressure, [bar]	120	120	135	115	125
Rated cont. output, [kW]	530	588	736	446	530
Corresponding to, [rpm]	1800	2100	2300	1500	1800

Type Approval documentation

Tests carried out

Test report titel	ER2002-008 dated 201-01-02
Place of test	Incheon, Republic of Korea

Marking of product

The product to be marked with manufacturer's name or trademark and type number identification.

Periodical assessment

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.

In case where the Type Approved product is manufactured at other companies, the Periodical Assessment shall verify that the Type Approval applicant has a quality control system for consistent production at their licensees/subcontractors. Furthermore Periodical Assessment shall be carried out randomly at these companies.

Other Conditions

Flexible hoses to be Type Approved by DNV GL.

Engine safety, control and monitoring systems, including sensors and actuators are not covered by this type approval certificate. Documentation for engine safety, control including speed governing and monitoring systems shall be submitted for approval according to the Rules Pt.4 Ch.9 Sec.1 Table 5 and/or as listed in relevant type approval certificates.

Electric cables and installation of this is not covered by this approval and must be verified to comply with the requirement of the Rules Pt.4 Ch.8 - Electrical Installation.

END OF CERTIFICATE