



# DET NORSKE VERITAS

## TYPE APPROVAL CERTIFICATE

CERTIFICATE NO. M-10511  
This Certificate consists of 3 pages

*This is to certify that the*  
**Diesel Engine**  
*with type designations*

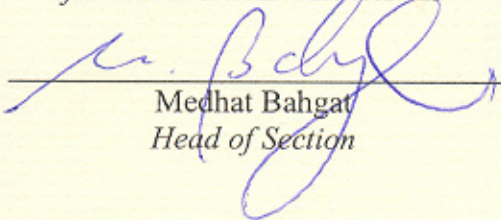
**MD196T, EYIRG, MD196TI, AD126TIF, AD126TIS, L126TIH,  
L126TIM**

*Manufactured by*  
**Doosan Infracore Co., Ltd.**  
INCHEON, Republic of Korea

*is found to comply with*  
Det Norske Veritas' Rules for Classification of Ships/High Speed and Light Craft

*Application*  
The approval is valid for propulsion and auxiliary duty.  
Rating see page 2

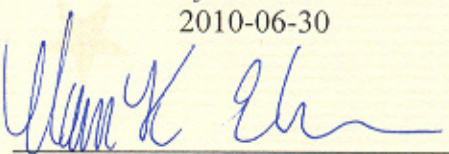
*Place and date*  
Høvik, 2006-05-04  
for DET NORSKE VERITAS AS

  
Medhat Bahgat  
Head of Section



Local Office  
DNV Seoul

*This Certificate is valid until*  
2010-06-30

  
Hans-Kristian Eriksen  
Surveyor

**Notice: 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.**

If any person suffers loss or damage which is proved to have been caused by any negligent act or omission of Det Norske Veritas, then Det Norske Veritas shall pay compensation to such person for his proved direct loss or damage. However, the compensation shall not exceed an amount equal to ten times the fee charged for the service in question, provided that the maximum compensation shall never exceed USD 2 million. In this provision "Det Norske Veritas" shall mean the Foundation Det Norske Veritas as well as all its subsidiaries, directors, officers, employees, agents and any other acting on behalf of Det Norske Veritas.



## Product description

Four stroke diesel engine.

Cylinder diameter: 123 mm  
Piston stroke: 155 mm  
No. of cylinders: 6 in-line

## Application/Limitation

The approval is valid for propulsion and auxiliary duty based on the main data given below:

Propulsion:

Engine model:	MD 196T	MD 196TI	L 126TIH	L 126TIM
Mean indicated pressure (bar):	13.15	15.02	16.9	17.89
Max. cylinder pressure (bar):	100	105	130	135
Rated cont. output (kw):	206	235	265	294
Corresponding to (RPM):	2000	2000	2000	2100

Auxiliary:

Engine model:	EYIRG	AD 126 TIF	AD 126 TIS
Mean indicated pressure (bar):	14.08	17.52	17.52
Max. cylinder pressure (bar):	100	125	130
Rated cont. output (kW):	199	206	247
Corresponding to (RPM):	1800	1500	1800

## Type Approval documentation

Crankshaft drawing 65.02101-0057 and other drawings mentioned in list of plans mentioned in our covering letter dated 01-10-12.

## Tests carried out

Type approval test carried out 99-02-24 to 99-03-12 for engine model MS 196TI.

## Marking of product

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



Cert. No.: M-10511  
File No.: 723.10

### Certificate retention survey

For retention of the Type Approval, DNV surveyor shall perform survey every second year and before expiry date of this certificate to verify that the conditions of the type approval is complied with.

### Other conditions

UTS of crankshaft material: Min. 785 N/mm<sup>2</sup>

Torsional vibration calculations to be submitted for each installation according to the Rules Pt.4, Ch.3, Sec.1, G Vibration.

Electrical cables and installation of these shall comply with the Rules Pt.4, Ch.8.

All field instrumentation, including test facilities shall comply with DNV Rules for Ships Pt.4, Ch.9.

Flexible hoses for flammable fluids to be type approved by DNV.

END OF CERTIFICATE