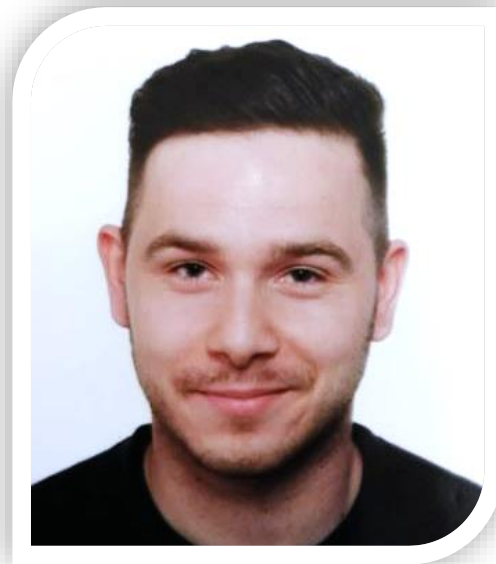


NRMM Stage V

Yannick Loulidi

Development Engineer Aftertreatment
Anglo Belgian Corporation





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Emission requirements Inland Waterway Vessels

EU Stage V– EU 2016/1628

Table II-5: Stage V emission limits for engine category IWP defined in point (5) of Article 4(1)

Emission stage	Engine sub-category	Power range	Ignition type	CO	HC	NO _x	PM mass	PN
		kW		g/kWh	g/kWh	g/kWh	g/kWh	#/kWh
Stage V	IWP-v-1 IWP-c-1	$19 \leq P < 75$	all	5,00	(HC + NO _x ≤ 4,70)		0,30	—
Stage V	IWP-v-2 IWP-c-2	$75 \leq P < 130$	all	5,00	(HC + NO _x ≤ 5,40)		0,14	—
Stage V	IWP-v-3 IWP-c-3	$130 \leq P < 300$	all	3,50	1,00	2,10	0,10	—
Stage V	IWP-v-4 IWP-c-4	$P \geq 300$	all	3,50	0,19	1,80	0,015	1×10^{12}



- According to BV rules Part F, Chapter 11 section 26 (3.1.1)

3 Requirements for ULEV additional class notation

3.1 Requirements for the engines

3.1.1 Engine testing and design

Compliance with the requirements of [3.2] is to be demonstrated through testing of an engine type as per [4].

Note 1: Engines type-approved in the scope of EU regulation 2016/1628 may be accepted without further testing, provided that satisfactory documentation is submitted to the Society.



Stage V certification set up: DPF + SCR

Engine

DPF

SCR

Mixing pipe

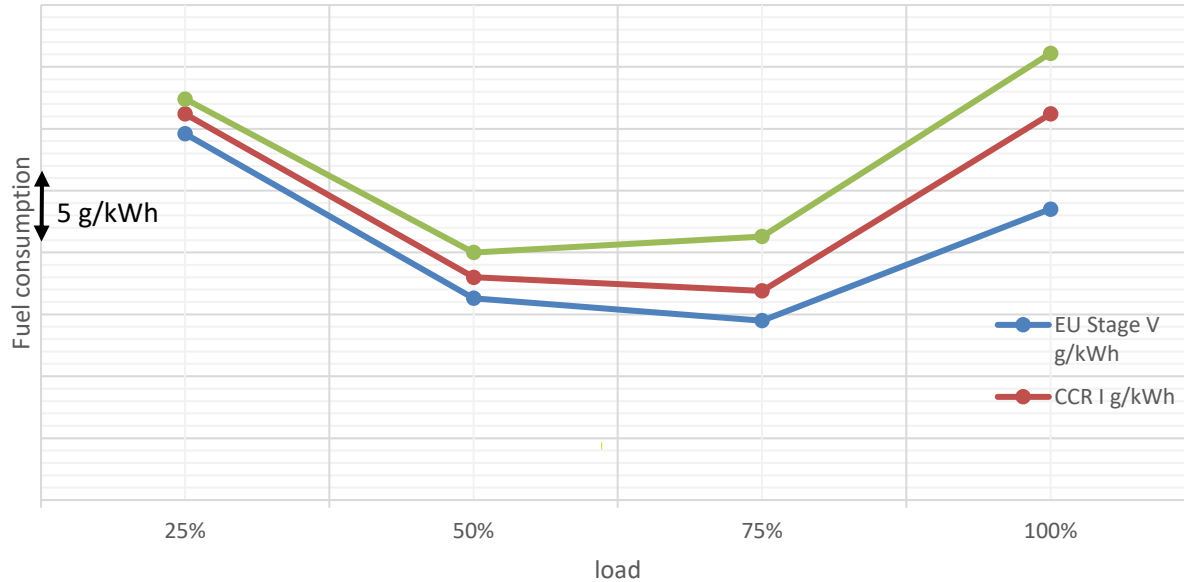
CCV





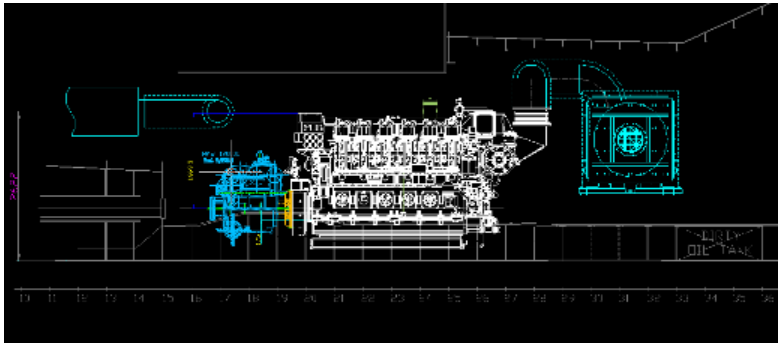
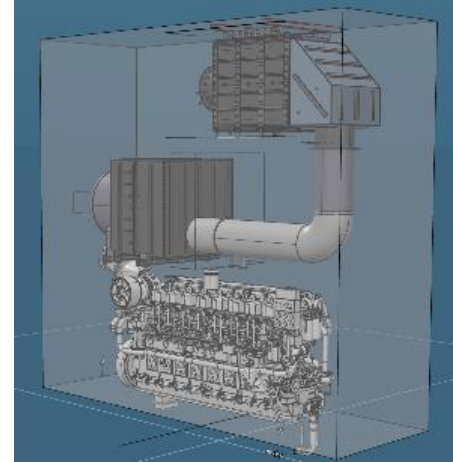
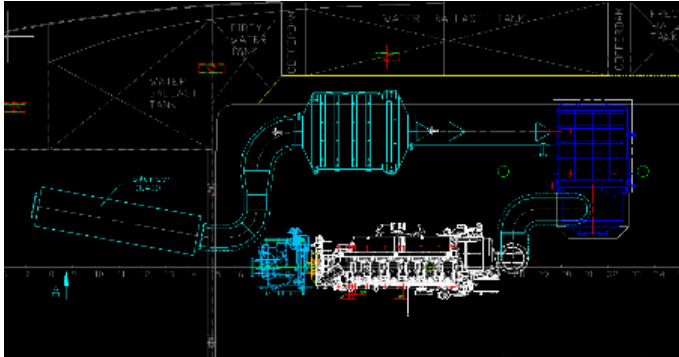
Stage V fuel consumption

fuel efficiency impact of engine emission tuning





Stage V lay out





Retrofit





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Emission reduction technologies

Stage V summary

ABC is the only engine manufacturer able to offer Stage V certified engines in their segment (medium speed engines) and went through the complete certification process as described in EU 2017/654.





Emission reduction technologies

Stage V certificate

Motor

Anglo Belgian Corporation | Stage V - IWP | Land | Bevoegde autoriteiten | Zoeken

Fabrikant	Aanduiding door de fabrikant	Type-goedkeuringsnummer	Houder van de typegoedkeuring	Datum van de goedkeuring	Fase / Teststandaard	Land	Bevoegde autoriteiten	Technische diensten	Inbouw toestaan	Gebruik toestaan	Opmerking	Bij ingetrokken goedkeuring, datum van intrekking
Anglo Belgian Corporation	6DZC, 6DZC	e6*2016/1628*2016/1628 PC4/D*0001*00	Anglo Belgian Corporation N.V. Wiedauwkaai 43, B-9000 Gent Belgium	30/04/2021	Stage V - IWP	BE	Antwerp	DG Navigation	✓	✓		
Anglo Belgian Corporation	12DZC, 16DZC	e6*2016/1628*2016/1628 PC4/D*0002*00	Anglo Belgian Corporation N.V. Wiedauwkaai 43, B-9000 Gent Belgium	30/04/2021	Stage V - IWP	BE	Antwerp	DG Navigation	✓	✓		

Laatst bijgewerkt: 20.05.2021



**EU-TYPEGOEDKEURINGSCERTIFICAAT
CERTIFICAT DE RÉCEPTION UE PAR TYPE**
EU TYPE-APPROVAL CERTIFICATE

**EU-TYPEGOEDKEURINGSCERTIFICAAT VOOR EEN MOTORTYPE OF EEN MOTORFAMILIE VOORSIET
VOOR DE WEG BESTEMDE MOBIELE MACHINES OVEREENKOMSTIG VERORDENING (EU) 2016/1628**

**CERTIFICAT DE RÉCEPTION UE PAR TYPE D'UN TYPE DE MOTEUR OU D'UNE FAMILIE DE MOTEURS
DESTINÉS AUX ENGINS MOBILES NON ROUTIERS CONFORMÉMENT AU RÈGLEMENT (UE) 2016/1628**

*EU TYPE-APPROVAL CERTIFICATE FOR AN ENGINE TYPE OR AN ENGINE FAMILY FOR NON-ROAD MOBILE MACHINERY
IN ACCORDANCE WITH REGULATION (EU) 2016/1628*

**Mededeling betreffende de
Communicatie concreet**

- EU-typegoedkeuring
- la réception UE par type
- EU type approval
- attestation van de EU-typegoedkeuring
- extension de la réception UE par type
- extension of EU type approval
- adagierung van de EU-typegoedkeuring
- le refus de la réception UE par type
- refusal of EU type approval
- intrekking van de EU-typegoedkeuring
- le retrait de la réception UE par type
- withdrawal of EU type approval

van een motortype/motorfamilie wat de uitstoot van verontreinigende gassen en deeltjes betreft op grond van Verordening (EU) 2016/1628, in zake het gewijzigd bij (Gedeeleerde) Verordening .../... (van de Commissie/van het Europees Parlement en de Raad) en ex qui concerne les émissions de gaz polluants et de particules polluantes conformément au règlement (UE) 2016/1628, modifié en dernier lieu par le règlement (délégé) .../... (de la Commission) (du Parlement européen et du Conseil).

EU-typegoedkeuringnummer
Numéro de réception UE par type : e6*2016/1628*2016/1628 PC4/D*0001*00
EU Type approval number

Reden voor de uitbreiding/wijziging/intrekking
Motif de l'extension/de refus/de retrait :
Reason for extension/refusal/withdrawal



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Questions?

Thank you for your attention!