

# STAGE V

status Euro VI equivalency  
| Peter van Gompel  
| Jeroen van Schaijk

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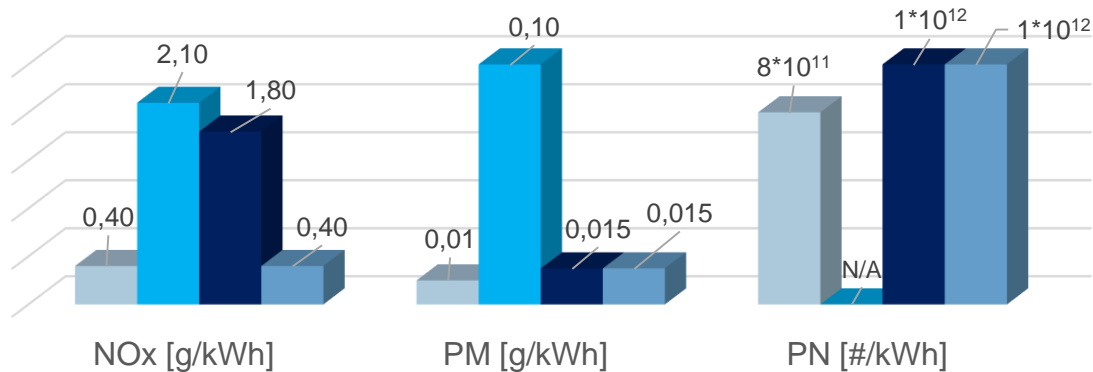
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# INTRODUCTION STAGE V ROOTS

## › Cases

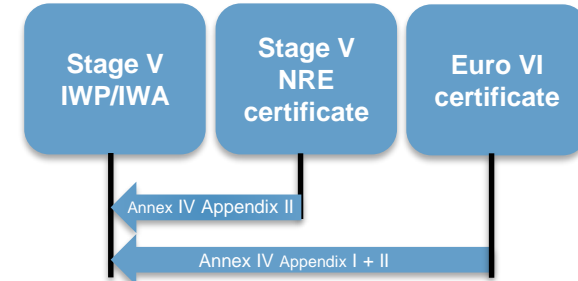
- › New Stage V – IWP/IWA OEM certification
- › On basis of equivalency:
  - Stage V - NRE (Non Road Equipment) certificate
  - Euro VI certificate

## › Emissions limits



■ Euro VI (WHSC)   
 ■ IWP 130≤P<300   
 ■ IWP P≥300   
 ■ NRE 130≤P<560

STAGE V



Regulation (EU) 2017/654 as last amended by Regulation (EU) 2018/989


# INTRODUCTION STAGE V ROOTS

## › Elements of type approval

Element	Stage V - 2016/1628 New IWP Vessel		Stage V - 2016/1628 NRE	Euro VI - EC 595/2009
Laboratory test: Test cycle(s) Off-cycle	E2 / D2 1 point	E3 2 points	C1, NRTC 3 points	WHSC, WHTC 15 points (in 3 grids)
Emissions Durability (EDP)	10.000 hours		8.000 hours	700.000 km
Diagnose	NCD - PCD		NCD - PCD	OBD
Inducement	No inducement (replaced by incident storage)		Power reduction 2 steps	Power reduction 2 steps
Ambient conditions	+2 to +30°C Pressure > 95,5 kPa		-7 to +38°C (PEMS) Pressure > 82,5 kPa	-7 to +38°C (PEMS) Pressure > 82,5 kPa

# EURO VI EQUIVALENCY TO STAGE V – IWP/IWA

## › Main requirements

- › Operator warning in case of a NOx Control Diagnostics (NCD) system failure
  - › Example: Warning light, warning signal on operator dashboard 
- › For safety reasons no inducement shall be activated in case of a failure.
  - › Example: diluted AdBlue, blocked AdBlue line, an empty AdBlue tank etc.
- › Incident storage in non-erasable memory
  - › In stead of the severe inducement the incident shall be stored with a corresponding occurrence counter and duration timer

# EURO VI EQUIVALENCY TO STAGE V – IWP/IWA

## › Main requirements

- › Documentation package describing the:
  - › Inducement prevention
  - › Operator warning and incident storage system
- › Demonstration report of the operator warning and incident storage system

# EURO VI EQUIVALENCY TO STAGE V – IWP/IWA

## › Status demonstration test

- › Performing demonstration tests of:
  - › Low AdBlue tank level – level based
  - › Low AdBlue quality – timer based – incident storage 20 engine hours after failure detection
  
- › Measurements by data acquisition system including
  - › GPS location
  - › Engine speed and load (OBD port)
  
- › Tests performed on a vessel in real world operation
  
- › Total test duration excl. preparation: ~4 days
- › Test preparation: ~1 day

# EURO VI EQUIVALENCY TO STAGE V – IWP/IWA

## › Process status

- › Finalizing phase with the RDW about:
  - › Reporting format
  - › Interpretation of regulation
- › After approval the demonstration tests will be scheduled
- › Test report will be submitted to the RDW



A nighttime photograph of a city street. In the foreground, a modern building with a curved, illuminated walkway is visible. The walkway has a metal mesh railing and is lit with warm white lights. In the background, a multi-story brick building with many lit windows stands on the left. On the right, a modern building with a curved facade and lit windows is visible. The street is lit with streetlights, and there are long, horizontal light trails in green and white, suggesting motion or traffic. The overall scene is a mix of old and new architecture.

› **THANK YOU FOR YOUR  
ATTENTION**

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