**Federation of Piling Specialists – March 2020**

**Guidance on Emission Standards for Non-Road Mobile Machinery (NRMM)**

On the 1st January 2017 Regulation (EU) 2106/1628(1) replaced Directive 97/68/EC, detailing the requirement for a reduction of exhaust gaseous(2) and particulate pollutants(3), and identifying an implementation timetable for Stage V emission compliant engines for use in Non Road Mobile Machinery(4) (NRMM). The key requirements of the Regulation are –

* Reduction of exhaust “Particle Mass” (PM)(5) –
	+ from 0.025 g/kWh at Stage IV to 0.015 g/kWh at Stage V

* Introduction of an exhaust “Particle Number” (PN)(6) -
	+ limit of 1 x 1012 / kWh for solid particles greater than 23nm Ǿ
* Extension of legislation to include -
	+ CI (Diesel) engines below 19 kW and above 560 kW Category NRE(7)
	+ All engines above 560 kW fitted to Generators Category NRG(8)

Stage V NRMM Emission Standards for NRE(7) + NRG(8) engine subcategories (17) (18) (19)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Engine Category | Net Power (kW) | Engine Type | Market Placement | CO(2) | HC(2) | NOx(2) | PN(5) | PM(6) |
| g/kWh | 1/kWh |
| NRE-v/c-1 | 0 < P < 8 | CI | 01/01/19 | 8.00 | 7.50 | 0.40 | - |
| NRE-v/c-2 | 8 ≤ P < 19 | CI | 6.60 | 7.50 | 0.40 | - |
| NRE-v/c-3 | 19 ≤ P < 37 | CI | 5.00 | 4.70 | 0.015 | 1x1012 |
| NRE-v/c-4 | 37 ≤ P < 56 | CI | 5.00 | 4.70 | 0.015 | 1x1012 |
| NRE-v/c-5 | 56 ≥ P < 130 | All | 01/01/20 | 5.00 | 0.19 | 0.40 | 0.015 | 1x1012 |
| NRE-v/c-6 | 130 ≥ P < 560 | All | 01/01/19 | 3.50 | 0.19 | 0.40 | 0.015 | 1x1012 |
| NRE-v/c-7 | P > 560 | All | 3.50 | 0.19 | 3.50 | 0.045 | - |
| NRG-v/c-1 | P > 560 | All |  |  |  |  |  |

 Note – NRE-c = constant speed engine (9), NRE–v = variable speed engines (10)

* “Market Placement” (or First Registration)
	+ Date after which all new engine types in relevant categories placed on market must meet requirements of Stage V. Start of transition period.
* “Transition Engine” (11)
	+ An engine meeting the latest applicable emission requirements prior to Stage V.
* “Transition Period”(12)
	+ 24 month period from date of relevant Stage V implementation date.
* Exemption(13) for category NRE engines only –
	+ Original Equipment Manufacturers(14) (OEM) producing less than 100 units per year of NRMM fitted with category NRE engines have a further 12 month exemption period(15).
	+ Mobile cranes(16) fitted with category NRE engines have a further 12 month exemption period.

Engine power less than (<) 56 kW and greater than (≥) 130 kW

* 01/01/19 - New engines types placed on market must meet Stage V emissions
* 30/06/20 - NRMM with prior “manufactured on” date can be fitted with transition engine
* 01/01/21 - NRMM with later “manufactured on” date must be fitted with Stage V engine
* 30/06/21 - NRMM with prior “manufactured on” date can be fitted with transition engine

 *if Original Equipment Manufacturer produces less than 100 units per year*

Engine power greater than (≥) 56 kW and less than (<) 130 kW

* 01/01/20 - New engines types placed on market must meet Stage V emissions
* 30/06/21 - NRMM with prior “manufactured on” date can be fitted with transition engine.
* 01/01/22 - NRMM with later “manufactured on” date must be fitted with Stage V engine
* 30/06/22 - NRMM with prior “manufactured on” date can be fitted with transition engine

 *if Original Equipment Manufacturer produces less than 100 units per year*

**Requirements for London NRMM (37 kW – 560 kW)**

**In addition to the EU Regulations, the Mayor of London (20) has identified the following emission reduction actions and timescales -**

•      1st January 2020:

All constant-speed engines, such as those typically found in generators, are required to meet Emissions Stage V throughout London either by technology or by retrofit for both NOx and PM reduction.

•      1st September 2020:

Engines [variable] operating in the CAZ/CW Zones, plus those within the GLA defined Opportunity Areas, are required to meet Emissions Stage IV as a minimum.

•      1st September 2020:

Engines [variable] operating in Greater London, but outside the CAZ/CW Zones or the Opportunity Areas,  are required to meet Emissions Stage IIIB as a minimum.

•      1st January 2025:

Engines [variable] are required to be at Emissions Stage IV as a minimum throughout London

•      2030:

Engines are required to be at Emissions Stage V as a minimum throughout London

•      2040:

Zero emissions from construction machinery throughout London

**References**

*Ref Article Paragraph Note*

1<https://www.legislation.gov.uk/eur/2016/1628/contents> Accessed - 6th March 2020

2 Article 3 (3) Gaseous pollutants

3 Article 3 (6) Particulate pollutants

4 Article 3 (1) Non-road mobile machinery

5 Article 3 (4) Particulate matter (PM)

6 Article 3 (5) Particle number (PN)

7 Article 4 (1) (a) Category - NRE engines

8 Article 4 (2) Category - NRG engines

9 Article 3 (21) Constant speed

10 Article 3 (22) Variable speed

11 Article 3 (32) (a) (b) Transitional engines

12 Article 3 (31) Transition period

13 Article 58 5 para 2 Exemption (OEM < 100 units per year)

14 Article 3 (54) Original Equipment Manufacturer

15 Article 3 (33) NRMM manufactured date

16 Article 3 (45) Mobile cranes

17 Annex I Table I-1 Subcategories of engine category NRE

18 Annex II Table II-1 Stage V Emission limits for engine category NRE

19 Annex III Table III-1 Dates of application of Regulations to NRE engines

*Ref Source*

20 <https://www.london.gov.uk/what-we-do/environment/pollution-and-air-quality/nrmm>

 Accessed – 6th March 2020