

## Amendments to Article 8 of the “Vehicular Air Pollutant Emission Standards”

Article 8 The exhaust emission standards of Carbon Monoxide (CO), Hydrocarbons (HC), Nitrogen Oxides (NO<sub>x</sub>), and Particulate Matter (PM) for Railway vehicles and exhaust emission standards of Particulate Matter (PM) for emissions for Ships are stipulated as the following table:

Transportation Vehicle Types	Date of Implementation	Emissions Standards							Remarks
		Duty Cycle Testing						Smoke	
		Classification	CO (g/kWh)	HC (g/kWh)	NO <sub>x</sub> (g/kWh)	HC + NO <sub>x</sub> (g/kWh)	PM (g/kWh)	Opacity (%)	
	Date of Announcement							40	1. During start duration (engine start and in acceleration process), the opacity not exceed 60% within 10 seconds is deemed as in compliance. 2. The visual opacity of 40% is equivalent to the Ringelmann scale NO. 2.
Railway Vehicles	April 27, 2017	Railcars with net power > 130 kW	3.5	0.19	2.0	-	0.025	-	1. The so-called railway vehicles in this article are divided into the following two categories: 1.1 Railcar: means a railway vehicle with motive power for propelling itself and is specifically designed to carry goods or passengers or both goods and passengers. 1.2 Locomotive: means a railway vehicle with motive power for propelling itself and for propelling other railway vehicles, itself being designed or intended not to carry freight or passengers. 2. The units for the Duty Cycle testing is g/(kW · h) and the test methods are as follows: 2.1 Railcar: in accordance with the EU directive Non-Road Steady Cycle (NRSC) 8 modes duty cycle tests or the ISO 8178-4 C1 duty cycle operated on a dynamometer. 2.2 Locomotive: in accordance with the EU directive Non-Road Steady Cycle (NRSC) 3 modes duty cycle test or the ISO 8178-4 F duty cycle operated on a dynamometer.
		Locomotives with net power > 130 kW	3.5	-	-	4.0	0.025	-	3. For domestic railcars and locomotives out of plant and import railcars and locomotives on-ship after April 27, 2017 shall comply with these standards; for already in-use or signed purchase contract before April 27, 2017, the original visual determination method of not to exceed 40% opacity limit is still applicable. 4. The railcars or locomotives comply with the following provisions are deemed as in compliance with these standards: 4.1 Being tested in accordance with the testing methods stipulated in the US CFR Part 1065 and obtained the US Tier 4 emission certificates or test report data. 4.2 Being tested in accordance with the testing methods stipulated in the EU directive 97/68 and its subsequent amendments and obtained the Railcar or locomotive related Stage IIIB emission certificates or test report data.
Ships	Date of Announcement							40	1. During start duration, for ship with main propulsion power above 3000 kW and not exceed 60% opacity within 20 seconds, and for ship with main propulsion power less than 3000 kW, and not exceed 60% opacity within 10 seconds are deemed as in compliance. 2. The visual opacity of 40% is equivalent to the Ringelmann scale NO. 2.