# Clean Air Zone (CAZ) - CLEAN VEHICLE RETROFIT CERTIFICATION

# INFORMATION DOCUMENT FOR CVRC LOW EMISSION ADAPTATIONS

For use by manufacturers applying to obtain Clean Vehicle Retrofit Certification for their low emission adaptions.

# Information document

If the system, components or separate technical units have electronic controls, information concerning their performance shall be supplied.

REC = Retrofit Emission Control Device

**1. General**

1.1. Make (trade name of manufacturer): .....

1.2. Name and address of manufacturer: .....

.....

1.3 Type of REC: .....

1.4. Location and method of affixing of the approval mark: .....

.....

1.5. Address(es) of assembly plant(s): .....

.....

**2. Description of the device**

2.1. Class of REC (as defined by UN(ECE) Regulation 132): .....

2.2. Make(s) (Commercial name), and manufacturer's type identification of the REC: .....

.....

2.2.1. Identifying part number(s) of the REC: .....

.....

2.3. Engine type or types for which the REC is intended (application range): .....

.....

2.4. Is the REC intended to be compatible with OBD requirements: Yes/No[1]

2.5. Description and drawings showing the position of the REC device relative to the engine exhaust manifold(s): .....

.....

2.6. Maximum allowable exhaust back pressure of the REC: .....kPa

**3. Characteristics of the particulate reduction REC and particulate reduction REC family**

3.1. Dimensions, shape and active volume of the particulate matter reduction system: .....

3.2. Maximum distance to the REC inlet from the outlet of the turbocharger (turbine) or the outlet plane of the exhaust manifold where no turbocharger is fitted.):.....

3.3. Description drawings and part lists of the Particulate Matter (PM) reduction REC

[1] Strike out what does not apply.

The description shall include a list of the main components (stating the part numbers) that are assembled to a REC for each application.

3.3.1. Type of retention of the active element (for example, adhesive or mechanical fixing): .....

3.3.2. Working principle of the PM reduction active element (for example metallic or ceramic material including material type, barrier filtration or aerodynamic separation): .....

3.3.3. Design and characteristics of the filter or other active material as defined in paragraph 14.1. (c) of UN(ECE) Regulation 132: .....

.....

3.3.3.1. Type(s) of catalytically active material(s) (if any): .....

3.3.3.2. Physical design of the substrate: .....

3.3.3.3. Cell density, porosity, mean pore size and pore size distribution: .....

.....

3.3.4. Location (upstream/downstream), function and working principle (e.g. oxidation) of any supplementary catalyst(s): .....

3.3.4.1. Type(s) of catalytically active material(s): .....

3.3.4.2. Physical design of the substrate: .....

3.3.4.3. Cell density: .....

3.3.5. Minimum volumetric concentration of catalytically active materials of each element of the particulate reduction system including supplementary catalysts (if fitted) (grams/m³): .....

3.3.6. Maximum volumetric concentration of catalytically active materials of each element of the particulate reduction system including supplementary catalysts (if fitted) (grams/m³): .....

3.3.7. The design characteristics of the canning or packaging: .....

3.3.8. Volume of each active component: .....

3.4. Method or system of regeneration (comprehensive description and/or drawing): .....

.....

3.4.1. Type of regeneration (for example periodic or continuous): .....

.....

3.4.2. Regeneration principle, frequency and strategy: .....

.....

3.4.3. Method and control strategy for introducing additives or reagents (if used): .....

.....

3.4.4. Type and concentration of reagent(s) or additive(s): .....

.....

3.4.5. Frequency of reagent or additive refill: .....

3.5. Description of PM reduction system monitoring: .....

.....

3.6. Description of any modifications to the original engine or emissions control system as defined in paragraph 11. of UN(ECE) Regulation 132:

.....

.....

3.7. Normal operating temperature: ..... (K) and pressure range: ..... (KPa)

3.8. Use of insulation: Yes/No[2]

3.8.1. Design and characteristics of the insulation: .....

[2] Strike out what does not apply.

## 4. Characteristics of the $NO_x$ reduction rec and $NO_x$ reduction REC family

4.1. Dimensions, shape and active volume of the $NO_x$ reduction system: .....

.....

4.2. Maximum distance to the REC inlet from the outlet of the turbocharger (turbine) or the outlet plane of the exhaust manifold where no turbocharger is fitted.):
.....

4.3. Description, drawings and part lists of the $NO_x$ reduction REC

The description shall include a list of the main components (stating the part numbers) that are assembled to a REC for each application.

4.3.1. Type of retention of the active element (for example, adhesive or mechanical fixing): .....

4.3.2. Working principle of the $NO_x$ reduction active element (for example Selective Catalytic Reduction, $NO_x$ Storage and Reduction): .....

.....

4.3.3. Design and characteristics of the substrate and active material as defined in paragraph 15.1. (d) and (e) of UN(ECE) Regulation 132:.....

4.3.3.1. Type(s) of catalytically active material(s): .....

4.3.3.2. Physical design of the substrate: .....

4.3.3.3. Cell density:.....

4.3.4. Location (upstream/downstream), function and working principle (e.g. oxidation) of any supplementary catalyst(s): .....

4.3.4.1. Type(s) of catalytically active material(s): .....

4.3.4.2. Physical design of the substrate: .....

4.3.4.3. Cell density:.....

4.3.5. Minimum volumetric concentration of catalytically active materials of each element of the $NO_x$ reduction system including supplementary catalysts (if fitted) (grams/$m^3$): .....

4.3.6. Maximum volumetric concentration of catalytically active materials of each element of the $NO_x$ reduction system including supplementary catalysts (if fitted) (grams/$m^3$): .....

4.3.7. The design characteristics of the canning or packaging:.....

4.3.8. Volume of each active component:.....

4.4. Method or system of regeneration (if applicable) (comprehensive description and/or drawing): .....

4.5. Method and control strategy for introducing additive(s) or reagent(s) (if used): .....

.....

4.5.1. Type and concentration of additive(s) or reagent(s): .....

.....

4.5.2. Normal operational temperature range of reagent (K): .....

4.5.3. Frequency of reagent or additive refill:.....

4.5.4. Control strategy (for example delay periods, reagent dosing rates, positioning and characteristics of sensors, flow characteristics and reagent introduction location): .....

4.6. Heated system: Yes/No[2]

4.6.1. Temperature control method (catalytic, thermal or electrothermal): .....

4.7. Description of $NO_x$ control diagnostic system: .....

4.8. Description of any modifications to the original engine or emissions control system as defined in paragraph 11. of UN(ECE) Regulation 132:

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4.9. Normal operating temperature: ..... (K) and pressure range: ..... (KPa)

4.10. Use of insulation: Yes/No[3]

4.10.1. Design and characteristics of the insulation:.....

[3] Strike out what does not apply.

## 5. Characteristics of the $NO_x$ and PM reduction REC and the $NO_x$ and PM reduction REC family

5.1. Dimensions, shape(s) and active volume(s) of the $NO_x$ and PM reduction system: .....

5.2. Maximum distance to the REC inlet from the outlet of the turbocharger (turbine) or the outlet plane of the exhaust manifold where no turbocharger is fitted): .....

5.3. Description, drawings and part lists of the $NO_x$ and Particulate Matter (PM) reduction REC

The description shall include a list of the main components (stating the part numbers) that are assembled to a REC for each application.

5.3.1. Type of retention of the active element(s) (for example, adhesive or mechanical fixing): .....

5.3.2. Working principles of the $NO_x$ reduction active element (for example Selective Catalytic Reduction, $NO_x$ Storage and Reduction) and of the PM reduction active element (for example metallic or ceramic material and material type, barrier filtration or aerodynamic separation): .....

.....

5.3.3. Design and characteristics of the substrate(s) and active material(s) as defined in paragraph 14.1. (c) and 15.1. (d) and (e) of UN(ECE) Regulation 132: .....

.....

5.3.3.1. Type(s) of catalytically active material(s): .....

5.3.3.2. Physical design of the substrate(s): .....

5.3.3.3. Working principle of the PM reduction active element (for example metallic or ceramic material including material type, barrier filtration or aerodynamic separation) .....

5.3.3.4. Cell density, porosity, mean pore size and pore size distribution of the PM reduction active element: .....

.....

5.3.4. Location (upstream/downstream), function and working principle (e.g. oxidation) of any supplementary catalyst(s): .....

5.3.4.1. Type(s) of catalytically active material(s): .....

5.3.4.2. Physical design of the substrate: .....

5.3.4.3. Cell density: .....

5.3.5. Minimum volumetric concentration of catalytically active materials of each element of the $NO_x$ and PM reduction system including supplementary catalysts (if fitted) (grams/$m^3$): .....

.....

5.3.6. Maximum volumetric concentration of catalytically active materials of each element of the $NO_x$ and PM reduction system including supplementary catalysts (if fitted) (grams/$m^3$): .....

.....

5.3.7. The design characteristics of the canning or packaging: .....

5.3.8. Volume of each active component: .....

5.4. Method(s) or system(s) of regeneration (if applicable) (comprehensive description and/or drawing): .....

5.4.1. Type of PM reduction system regeneration (for example periodic or continuous): .....

5.4.2. PM reduction system regeneration principle and regeneration strategy: .....

.....

5.5. Method and control strategy for introducing additives or reagents (if used):

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5.5.1. Type and concentration of reagent(s) or additive(s) (if used): .....

.....

5.5.2. Frequency of reagent(s) or additive(s) refill: .....

5.5.3. Normal operational temperature range of $NO_x$ reduction reagent(s): ..... (K)

5.5.4. Control strategy (for example delay periods, reagent dosing rates, positioning and characteristics of sensors, flow characteristics and reagent introduction location): .....

5.6. Heated system: Yes/No[4]

5.6.1. Temperature control method (catalytic, thermal or electrothermal): .....

5.7. Description of PM reduction system monitoring: .....

5.8. Description of $NO_x$ control diagnostic system: .....

5.9. Description of any modifications to the original engine or emissions control system as defined in paragraph 11. of UN(ECE) Regulation 132:

.....

.....

5.10. Normal operating temperature: ..... (K) and pressure range: ..... (KPa)

5.11. Use of insulation: Yes/No[4]

5.11.1. Design and characteristics of the insulation:

[4] Strike out what does not apply.