



National Standards Authority of Ireland

**ECE TYPE-APPROVAL CERTIFICATE**

Communication concerning the approval granted  
of a replacement catalytic converter pursuant to  
Regulation No.103.



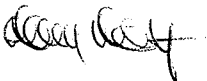
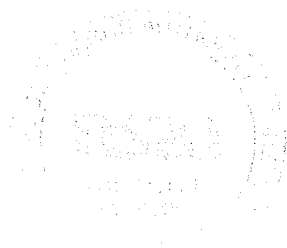
Approval No: ***E24 103R-000048***

Extension No: *N/A.*

Reason for extension:

*N/A*


1. Applicant's name and address: *Ecocat Oy,  
Vihtavuorentie 162,  
FI-41331, Vihtavuori,  
Finland.*
2. Manufacturer's name and address: *See 1. above.*
3. Manufacturer's trade name or mark: *Ecocat and Ecocat's authorized trademarks*
4. Type and commercial designation of the replacement catalytic converter: *82519*
5. Means of identification of type, if marked: *Manufacturers plate*
- 5.1 Location of that marking: *Plate affixed to side of converter*
6. Vehicle type(s) for which the catalytic converter type qualifies as replacement catalytic converter: *See technical report  
TW-E0802-R103-84952-82519  
and accompanying manufacturer's  
information document.*
7. Type(s) of vehicle(s) on which the replacement catalytic converter has been tested: *See technical report  
TW-E0802-R103-84952-82519  
and accompanying manufacturer's  
information document..*
- 7.1 Has the replacement catalytic converter demonstrated compatibility with OBD requirements: Yes/No: *No.*

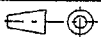
8. Location and method of affixing of the approval mark: *Plate affixed to side of converter*
9. Submitted for approval on: *18.10.2007*
10. Technical service responsible for carrying out the tests: *Test World Ltd.,  
Vetokuja 4,  
01610 Vantaa  
Finland.*
- 10.1. Date of test report: *02.07.2008 ( Test World report)  
03.12.2007 ( VTT report)*
- 10.2. Number of test report: *TW-E0802-R103-84952-82519  
& VTT-S-10828-07*
11. Approval granted/extended/refused/withdrawn: *Granted.*
12. Place: *Dublin.*
13. Date: *3<sup>rd</sup> July, 2008.*
14. Signature:  
13. Annexed to this communication is a list of documents in the approval file deposited at the administrative services having delivered the approval and which can be obtained upon request
- Documentation: *23 Pages.*







	4	3	2			
CODE	AMOUNT	POSITION	REVISION	DATE	REV.	APPR.



PART NO	NAME OF PART, SHAPE, DIMENSIONS OR MODEL	DWG NO OR STANDARD	MATERIAL	QTY WEIGHT	PCS
SURFACE	C. WEIGHT KG	W. WEIGHT KG	WORK NO	SCALE	FORM. NO
			DATE	DESIGN.	CHECK.
					APPR.
					
<b>ECOCAT</b>					<b>GRT1</b>
					DWG NO
					<b>KTD10481</b>
					REVISION

	4	3	2						
F	CODE	AMOUNT	POSITION	REVISION	DATE	REV.	APPR.		
E									
D									
C									
B									
A	PART NO	NAME OF PART, SHAPE, DIMENSIONS OR MODEL			DWG NO OR STANDARD	MATERIAL	QTY WEIGHT	PCS	
	SURFACE	C. WEIGHT W. WEIGHT	KG KG	WORK NO DATE	DESIGN.	CHECK.	APPR.	SCALE	FORM. NO NEW NO REF. DWG
									
	<b>ECOCAT</b>					<b>KG-1N</b>		REVI-SION	
						DWG NO <b>KTD10480</b>			

**Customer/ Requested by** Ecocat Oy, **Juha Laiho**, Vihtavuorentie 162 P.O.Box 20 FIN-41331  
Vihtavuori, Finland

**Order**                      Email

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**Assignment**                      Testing for type approval for replacement catalytic converter for power-driven  
vehicle according to ECE Regulation No. 103

In Espoo 3.12.2007



Juhani Laurikko, Customer Manager



Petri Laine, Research Engineer

**Distribution**                      Customer                      Original  
VTT / Register Office                      Original

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### 1. Description

Emissions were measured according to the procedures described in Regulation No. 103, par. 5.2.1. and 5.2.2., using Type 1 test according to Regulation No. 83, with the original converter and with four (4) replacement converters delivered by Ecocat.

The tests were carried out at VTT test facilities in Espoo, Finland, by VTT personnel. This type of testing is similar to that of European Directive 70/220/EEC, which is at VTT accredited by FINAS, (Ref. T001, see App. 1.)

### 2. Measurement equipment

The tests were carried out with measurement equipment described in Appendix 2. All the measurement equipment used for testing fullfil the requirements of Regulation No. 83.

### 3. Description of the test vehicle, dynamometer set-up and preconditioning

See Appendix 3 for vehicle parameter. The odometer reading in the beginning of the tests was 37887 km. Thus, applicable deterioration factors according to par 5.4. of Regulation No. 103 were used when calculating the mean values (M\*).

Originally, there were no OBD systems provided by the manufacturer of the vehicle (Euro1). Hence, OBD performance needed not to be demonstrated.

The dynamometer set-up values, determined according to par. 3.2.1. in Annex 4/ Appendix 2, of the Regulation No. 83, were: Inertia: 1020 kg, F0=6, F1=0 and F2=0.0412.

Before first test run for each converter, preconditioning was run according to Regulation No. 103, par. 5.2.1., i.e. 12 times the Extra-Urban Driving Cycle (EUDC).

### 4. Description of the aftermarket catalyst #84952 and #82519

#### 4.1 Type of reduction system

3-way catalytic converter.

#### 4.2 Dimensions and other specifications of the converters

<i>Product number</i>		82519
<i>Dwg number</i>	KTT4952-1	KTT-2519-1
<i>Model</i>	Laminar	Laminar
<i>cpsi</i>	400	400
<i>shape</i>	race track	race track
<i>length, mm</i>	74.5	120
<i>diameter</i>	75*95	75*95
<i>Pt.Pd:Rh</i>	0:10:01	0:07:01
<i>Type /loading, g/dm<sup>3</sup></i>	K3 / 0.353	K3 / 0.946
<i>Total PM, g</i>	0.16	0.672
<i>volume, l</i>	0.44	0.71

#### 4.3 Design See Appendices 4 and 5.

## 5. Emission of pollutants

Conduct of the tests and calculation of emission was made according to Type 1 Test, described in Regulation No. 83. The tests were carried out in October and November 2007.

### 5.1 Original (OEM) catalyst (unmarked)

Emissions of pollutants in type 1 test	Original Converter (OEM)					
	Tests			Mean value	Limit value <sup>1</sup>	Evaluation
	1	2	3	S	G	S ≤ G
	#27159	#27160	#27161			
CO (g/km)	0.77	0.75	0.84	0.79	2.72	YES
HC + NOx (g/km)	0.20	0.23	0.25	0.22	0.97	YES
Fuel cons. (l/100km)	6.84	6.72	6.65	6.74	n/a	n/a

<sup>1</sup> M<sub>1</sub>, class I Euro 1 emission limit values

### Converter #84952

Emissions of pollutants in type 1 test	Converter #84952							
	Tests			Mean value		Evaluation		
	1	2	3	M	M*	0,85S+0,4G	M* ≤ 0,85S+0,4G	M* ≤ G
	#27168	#27169	#27170					
CO (g/km)	0.76	1.02	1.21	1.00	1.20	1.76	YES	YES
HC + NOx (g/km)	0.40	0.43	0.46	0.43	0.52	0.58	YES	YES
Fuel cons. (l/100km)	6.75	6.74	6.71	6.74	-	n/a	n/a	n/a

\* multiplied with Df according to par. 5.4. of Regulation No. 103

### 5.3 Converter #82519

Emission of pollutants using converter #82519 was deemed to be equal or less than those recorded for converter #84952, as the converters were identical with regard to shape and frontal area. However, according to manufacturer's information, the loading and composition of the catalytic material in the longer converter (not tested) were different, as loading was much higher in the longer converter and Pd:Rh ratio was in favour of higher Rh for good NOx conversion efficiency. Therefore it should perform superior to the tested converter. Hence, the emissions test results should be at least equal to the unit tested, and **both units can be claimed to fulfill the requirements of R-103 regarding exhaust emissions.**

## Appendices

Appendix 1 - Accreditation T001 by FINAS (Exhaust Emissions from light-duty vehicles)

Appendix 2 - Description of the measurement equipments

Appendix 3 - Description of the test vehicle

Appendix 4 - Catalytic converter design 84952

Appendix 5 - Catalytic converter design 82519

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Päästöjen hallinta  
Emission control  
02.04.2007 Päätöksen päiväys / Date of decision  
31.12.2009 Päätöksen viimeinen voimassaolopäivä / Date of expiry

**T001 VTT, ASIAANTUNTIJAPALVELUT***VTT, EXPERT SERVICES*

Tunnus Code	Yksikkö tai toimintoala Department or section of activity	Osoite Address	Puh./fax/e-mail/www Tel./fax/e-mail/www
T001	VTT, Päästöjen hallinta	(Biologinkuja 7, Espoo) PL 1000 02044 VTT	Puhelin: 020 722 111 Fax: 020 722 7026 E-mail: etunimi.sukunimi@vtt.fi www.vtt.fi
	VTT, Emission control	(Biologinkuja 7, Espoo) P.O.Box 1000 FI-02044 VTT FINLAND	Phone int.:+358 20 722 111 Fax int.:+358 20 722 7026 E-mail: forename.surname@vtt.fi www.vtt.fi

Vastuhenkilö: Manager:	Testausalat Fields of testing
Margareta Wahlström	Teollisuusjätteiden ja sivutuotteiden liukoisuustestit Leaching tests of industrial solid wastes and secondary raw materials
Tuula Pellikka	Päästömittaukset Emission measurements
Mårten Westerholm	Moottoreiden pakokaasujen päästömittaukset Exhaust emission measurements of engines
Matti Kytö	Imuventtiilien puhtauden testaus Inlet valve cleanliness testing
Ari-Pekka Pellikka	Henkilö- ja pakettiautojen pakokaasujen päästömittaukset Exhaust emission of light-duty vehicles
Ari-Pekka Pellikka	Raskaan kaluston ajoneuvojen pakokaasujen päästömittaukset Exhaust emission of heavy-duty vehicles

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Päästöjen hallinta

Emission control

02.04.2007

Päätöksen päiväys / Date of decision

31.12.2009

Päätöksen viimeinen voimassaolopäivä / Date of expiry

PÄTEVYYSALUE		
SCOPE OF ACCREDITATION		
Testattava materiaali / tuote <i>Material / product tested</i>	Testityyppi, mittausalue <i>Type of test, measured range</i>	Testausmenetelmä <i>Test method</i>
<b>Päästömittaukset</b> <i>Emission measurements</i>		
Raskaan kaluston moottorit, jotka on tarkoitettu käytettäväksi tieliikenneajoneuvoissa. <i>Heavy-duty engines intended for use in vehicles on the road</i>	Säännellyt pakokaasupäästöt: CO, HC, NMHC, CH <sub>4</sub> , hiukkaspäästöt ja pakokaasun opasiteetti <i>Regulated exhaust emissions: CO, HC, NMHC, CH<sub>4</sub>, particulates and gas opacity</i>	Direktiivi 1999/96/EC (lisäys direktiiviin 88/77/EEC) ja sen lisäysdirektiivit (VTT:n koodi MK02C) <i>Directive 1999/96/EC (amending 88/77/EEC) and its amendments (VTT code MK02C)</i>
Raskaat ajoneuvot <i>Heavy-duty vehicles</i>	Säännellyt pakokaasupäästöt: CO, HC, NMHC, CH <sub>4</sub> , hiukkaspäästöt. Energiankulutus <i>Regulated exhaust emissions: CO, HC, NMHC, CH<sub>4</sub> particulates. Fuel economy</i>	Sisäinen menetelmä, VTT:n koodi MK02E (viittaukset direktiiveihin 1999/96/EC, 70/220/EEC, 91/441/EEC, 98/96/EC ja SAEJ2711 menetelmään) <i>In-house method, VTT code MK02E (ref. Directives 1999/96/EC, 70/220/EEC, 91/441/EEC, 98/96/EC and SAEJ2711 recommended practice)</i>
Työkoneiden moottorit, (alle 660 kW) <i>Off-road engines (below 660 kW)</i>	Säännellyt pakokaasupäästöt: CO, HC, NO <sub>x</sub> ja hiukkaspäästöt <i>Regulated exhaust emissions: CO, HC, NO<sub>x</sub> and particulate matter</i>	- Normi ISO 8178, Parts 1,4,5,6, syklit C1, C2, D1, D2 (VTT koodi M02A, B, C) - Direktiivi 97/68/EY (VTT:n koodi MK02A ja C) - ISO 8178, Parts 1,4,5,6 cycles C1, C2, D1, D2 (VTT koodi M02A, B, C) - Directive 97/68/EC (VTT koodi MK02A and C)
Bensiini tai bensiinin lisäaine <i>Gasoline or gasoline additive</i>	Imuventtiilien puhtaus MB M102E-moottorilla <i>Inlet valve cleanliness in the MB 102E engine</i>	Menetelmä CEC-F-05-A-93 (VTT:n koodi MK03) <i>Test CEC-F-05-A-93 (VTT code MK03)</i>

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Päästöjen hallinta

Emission control

02.04.2007

Päätöksen päiväys / Date of decision

31.12.2009

Päätöksen viimeinen voimassaolopäivä / Date of expiry

PÄTEVYYSALUE SCOPE OF ACCREDITATION		
Testattava materiaali / tuote <i>Material / product tested</i>	Testityyppi, mitta-alue <i>Type of test, measured range</i>	Testausmenetelmä <i>Test method</i>
Henkilö- ja pakettiautot <i>Light-duty vehicles</i>	Säännellyt pakokaasupäästöt: CO, HC, NO <sub>x</sub> sekä dieselautoilla hiukkaspäästöt <i>Regulated exhaust emissions: CO, HC, NO<sub>x</sub> and particulates in the case of diesel vehicles</i>	Direktiivi 70/220/EEC lisäyksineen, testimenetelmä kuvattu kokonaisuudessaan lisäysdirektiivissä 91/441/EEC. (VTT:n koodi MK01) <i>Directive 70/220/EEC with amendments. Test method is described in amendment 91/441/EEC. (VTT code MK01)</i>
Poistokaasu <i>Exhaust gases from stationary sources</i>	Kaasumaisten komponenttien määrittäminen jatkuvatoimisella FT-IR-tekniikalla poistokaasusta <i>Stationary source emissions. Continuous analysers. Determination of gaseous components by FT-IR- technique.</i>	Standardien SFS 3869 ja SFS 5624 mukaisesti (Menetelmäohje PRO 320202) <i>According to standards SFS 3869 and SFS 5624 (Guideline PRO 320202).</i>
<b>Teollisuusjätteiden ja sivutuotteiden liukoisuustestit</b> <i>Leaching testings of industrial solid wastes and secondary raw materials</i>		
Jätteet ja sivutuotteet <i>Wastes and secondary raw materials</i>	Liukenevien aineiden tutkiminen kolonnitestillä <i>Study on leaching of compounds by column test</i>	CEN-standardin prCEN/TS 14405 mukaisesti (menetelmäohje KET 3600197) <i>According to CEN method prCEN/TS 14405 (Guideline KET 3600197)</i>
Jätteet ja sivutuotteet <i>Wastes and secondary raw materials</i>	Hollantilainen diffuusiotesti. Kumulatiivisen liukenemisen tutkiminen pinnaltaan säännöllisenmuotoisista kiinteytettyistä tai monoliittisista <i>Dutch diffusion test. Study on cumulative leaching from regular surfaces of solidified or monolithic materials.</i>	Hollantilaisen standardin NEN 7345 mukaisesti (menetelmäohje KET 3600397) <i>According to Dutch standard NEN 7345 (Guideline KET 3600397)</i>

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Päästöjen hallinta

Emission control

02.04.2007

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PÄTEVYYSALUE		
SCOPE OF ACCREDITATION		
Testattava materiaali / tuote <i>Material / product tested</i>	Testityyppi, mittausalue <i>Type of test, measured range</i>	Testausmenetelmä <i>Test method</i>
Jätteet ja sivutuotteet <i>Wastes and secondary raw materials</i>	Materiaalista liukenevien aineiden karkea arviointi laadunvalvontatestillä (ravistelutesti) <i>Study on leaching of compounds from materials by compliance tests (batch leaching test)</i>	CEN-standardin EN 12457 mukaisesti (menetelmäohje KET 3600697) <i>According to CEN-method EN 12457 (Guideline KET 3600697)</i>
Jätteet ja sivutuotteet <i>Wastes and secondary raw materials</i>	Liukenevien aineiden tutkiminen eri pH-arvoissa (pH-staattinen testi) (ravistelutesti) <i>Study on the leaching behavior of compounds at specified pH-values by using pH-static test series</i>	CEN-standardin prCEN/TS 14997 mukaisesti (menetelmäohje KET 3601697) <i>According to the CEN method prCEN/TS 14997 Guideline KET 3601697</i>

Appendix 2

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**Description of the measurement equipments**

	<b>Chassis dynamometer</b>	<b>Sampling system Hardware</b>	<b>Pollution analysers</b>
<b>Manufacturer</b>	Froude-Consine	Pierburg CVS WT12.5	Pierburg AMA2000
<b>Type</b>	Single-roller (1 m), electric	PDP + tedlar bags (3+3)	NDIR, FID, CLD

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## Appendix 3

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**Description of the test vehicle**

<b>Manufacturer</b>	<b>Model, variant</b>	<b>Commercial description</b>	<b>Year model</b>	<b>VIN no.</b>
Opel	CITY-B-73/244	Corsa 1.2i	1993	VSX000073P4130761

<b>Engine type</b>	<b>Engine Displacement (litre)</b>	<b>Maximum engine power kW</b>	<b>no. of gears / transmission type</b>
4 cyl, 4 stroke	1.19	33	4 / Manual

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