

High performance DPF Sky Sweeper™

DPF for diesel vehicles

Nikkei Industrial
July 11th, 2000

Black Smoke 80% Reduction

Diesel particulate filter) "Sky Sweeper"
It reduces 80% of black smoke exhaust gas.

Hydrogen Energy Laboratory Project Co., Ltd., has developed a new type of DPF (Diesel particulate filter), which reduces 80% of SPM(suspended particulate matter), such as black smoke, exhaust from diesel engine, while it does not increase the amount of NOx.

The new DPF, Sky Sweeper, discomposes black smoke through a purification device made from honeycomb structure and ceramic balloons. Inside the device, the temperature of exhaust gas increases from 200°C to 700~ 800°C, and it makes oxidation combustion of carbon particulates occur.

In the process of oxidization combustion, NOx discomposes and nitrogen gas is produced. The level of NOx remains the same as normal. The experiment at the lab shows Sky Sweeper decreased 80 percent more black smoke compared to existing filters.

The company applied for a patent in 1996 and the product became in practical use after improved repeatedly. The price of Sky Sweeper is very cheaper than that of major producers.

日経産業新聞

二〇〇〇年(平成十二年)七月十一日 日曜 日掲載

The Pioneer of Clean Energy - To The Next Civilization



H.E.L.P.

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10 Characteristics of Sky Sweeper™

1. NO DESIGN CHANGE OF CURRENT DIESEL ENGINE
2. NO NEED OF THE QUALITY IMPROVEMENT OF LIGHT OIL
3. SIMPLE STRUCTURE
(STAINLESS CASE, HONEYCOMB STRUCTURE AND CERAMIC BALOON)
4. SIMPLE PRINCIPLE(EXHAUST COMBUSTION BY HEATED CERAMIC BALOON BY EXHAUST GAS ENERGY)
5. NO FILTER(Only Sky Sweeper I)
6. NO ELECTRIC WIRING(used for NOx reduction device)
7. EASY MAINTENANCE
8. EASY APPLICATION
9. LOW COST
10. IN PRACTICAL USE



● Inspection before shipping

* Exhaust pressure may alter after the installation of Sky Sweeper™

The Test Result at the public institution



JAPAN VEHICLE INSPECTION ASSOCIATION

平成 18 年 5 月 29 日
自動車排出ガス試験成績表
株式会社 水素エネルギー開発研究所 殿

財団法人 日本車両検査協会

自動車試験所

	D 13 Mode	NO 5	Free Accel 4S'
Unit	(g/kw · h)	(g/kw · h)	(g/kw · h)
Standard Muffler	0.579	0.363	16
Sky Sweeper™	0.175	0.117	7
Sky Sweeper™	69.7	67.7	56.2

*D 13 Mode・・・13 mode emission measuring method by chassis dynamometer based on Japanese Safety Standard for Road trucking vehicle

*NO 5・・・Metropolitan driving mode based on actual driving patterns

*Free Accel 4S'・・・Keeping full accelerated over 1 second in unloaded condition

Sky Sweeper™ Patent Overview

(19) Japan Patent Office

(12) Unexamined patent publication bulletin

(11) 特許出願公開番号
特開平9-280035

(43) 公開日 平成9年(1997)10月28日

(51) Int.Cl.	識別記号	庁内整理番号	F I	技術表示箇所
F 0 1 N 3/02	3 2 1		F 0 1 N 3/02	3 2 1 Z
	Z A B			Z A B
	3 0 1			3 0 1 B
				3 0 1 H
3/08	Z A B		3/08	Z A B E

審査請求 未請求 請求項の数5 F D (全 4 頁)

(21) 出願番号 特願平8-115265

(22) 出願日 平成8年(1996)4月15日

(71) 出願人 596064569

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(54) Name of Invention = Exhaust gas purification device for a internal combustion engine.

(57) Summary

【Target】

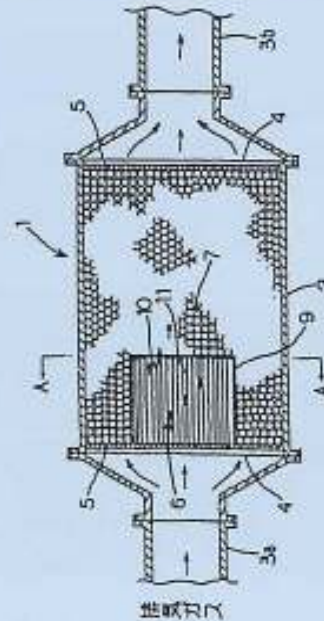
To purify a exhaust gas by energy of exhaust gas.

【 Solution 】

The purification device for exhaust gas (1) is composed of 2 pieces of ceramic punching plates (5), honeycomb structure(6) surrounded by ceramic balloons (7).

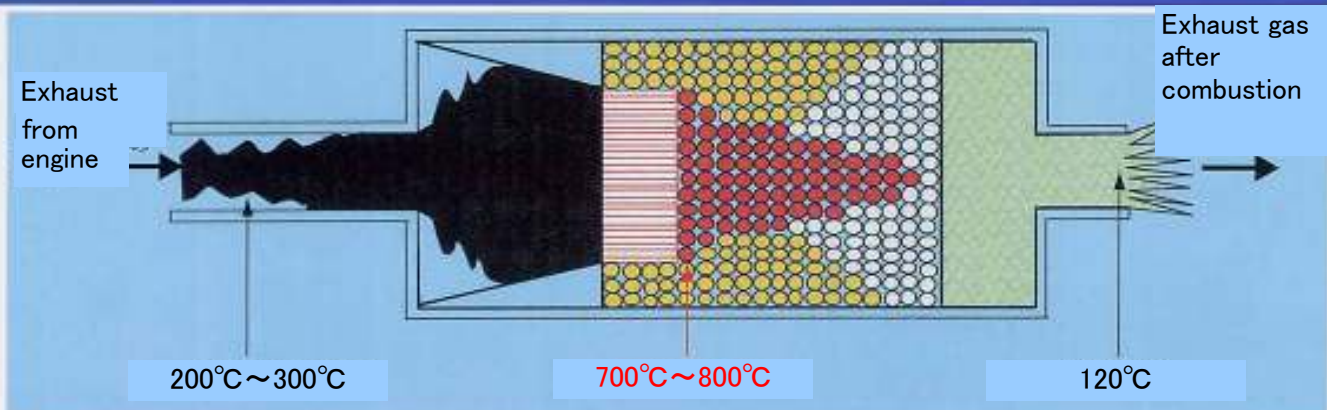
Inside of honeycomb structure (6), exhaust dynamic become static pressure, and it increases the temperature of honeycomb structure. The ceramic balloons (7) make exhaust wave motion to a microwave, and it reduces exhaust noise and emits far-infrared radiation.

The effect of increased temperature of honeycomb structure and far-infrared radiation increase temperature of the ceramic balloons (No 7) up to 600 ~ 800°C and cause combustion of carbon particulate. A steam within the exhaust gas becomes super-heated steam by passing through high temperature area. The super-heated steam removes oxygen from NOx and converts its oxygen for combustion of carbon particulate, such as black smoke.



監製 日本国特許庁

The Basic Mechanism of PM Reduction



Installation Patterns of Sky Sweeper™



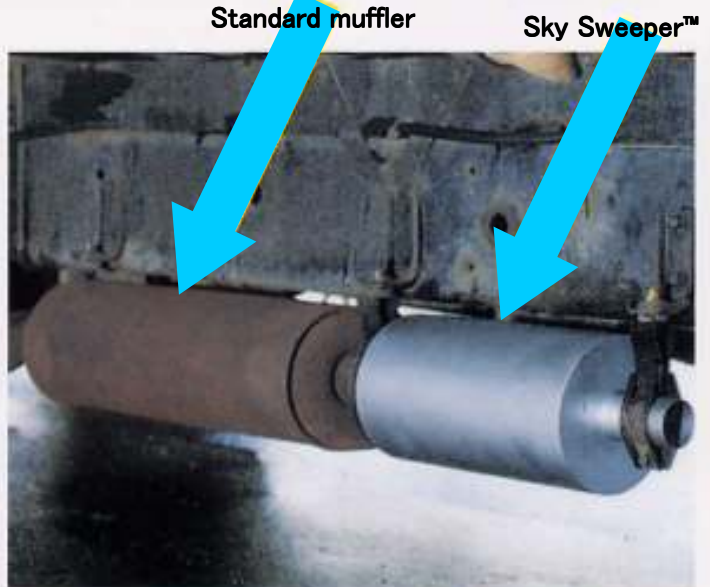
● Construction machine



● Regular Track



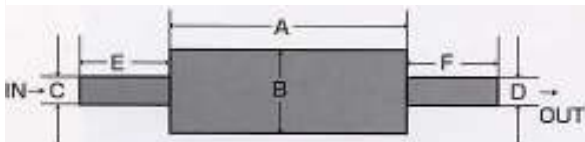
● Van



● Size comparison Sky Sweeper™ (right) with standard muffler (left)
* Originally equipped muffler is replaced by Sky Sweeper™

Sky Sweeper™ production and sales

- Easy to install. Easy maintenance.
Just replace an original muffler installed by Sky Sweeper™.
(Only a few flange processing)
Make - to - order system
(The measurement below is required.)



Unit: mm

ご注文・お問い合わせは下記へ

大気を汚染し、発ガン性物質を含むとされるディーゼル排ガスの浄化に努めましょう。