

Certificate of Test & Analysis ResultsReference No. **2007 - 619**

- Name of Applicant : **Jae-Sung, Park**
- Name of Company : **KOOLANCE. INC**
- Address of Applicant : **#430-817 801 Dongyong Venturastel 3 Cha, 202-4, Anyang 7-Dong, Manan-gu, Anyang-Si, Kyunggi-Do, S - Korea**
- Date of Receipt : **16 . May. 2007**
- Date of Test : **01 . June . 2007**
- Name of the Sample : **Radiator(PA SERIES 120.2)**
- Test Method : **KS R 1043**

• **Results of Test & Analysis**

Test Classify	Test Condition	Test Result	Test Method
Radiation Performance Test	Refer to Page 2	Refer to Page 3	KS R 1043

Test conducted by Jwa-ik, BeaApproved by Taek-song, Nam

The above result is obtained from the test and analysis performed by our Institute on the sample submitted by the applicant.

Date. **8** . June . **2007**

President

Korea Automotive Technology Institute

NOTE : This test/analysis report shall not be used on the purpose of any legal issues including lawsuit, advertisement, deed, etc.

Test Methods

【 Name of the Test 】 : Radiation Performance Test

【 Name of the Sample 】 : PA SERIES 120.2

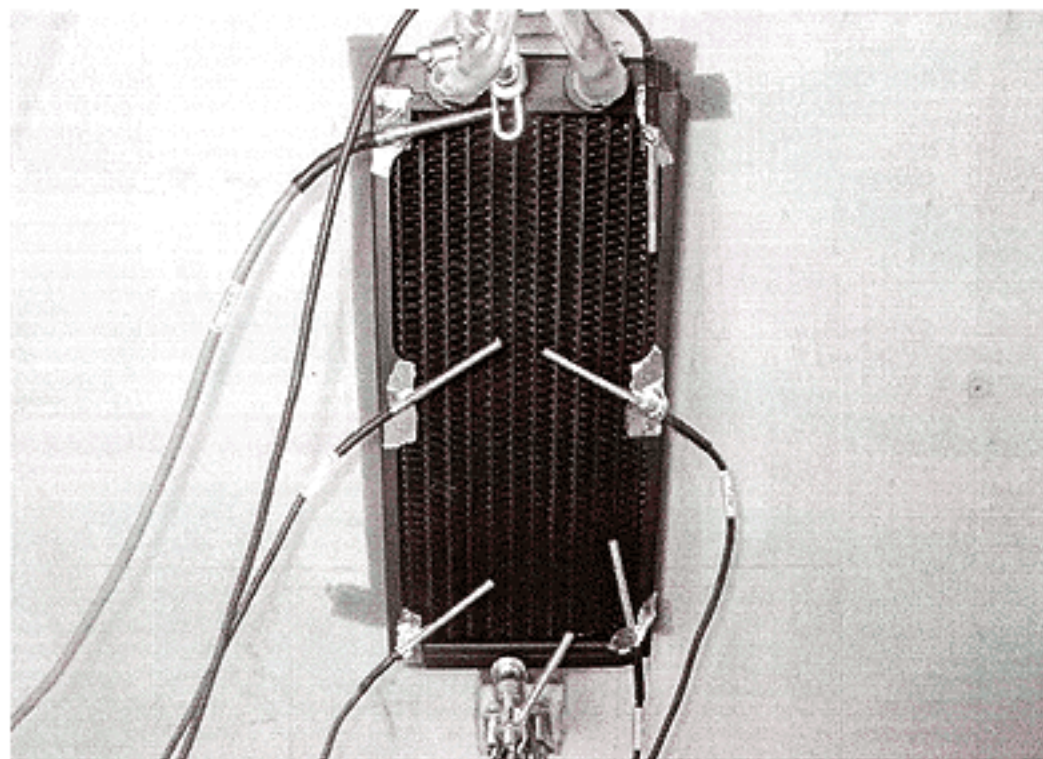
【 Sample Quantity 】 : 1 ea

【 Test Condition 】 :

- Water Temp : (84 ± 1) °C
- Flow Quantity Of Water : 5 ℓ/min
- Air Flow : 5.0 m/sec
- The Temp Diff. Between Hot Water&Air At Inlet 60deg

【 Test Method 】 :

- Installation of the sample on the test system which can measure the radiation performance of the radiator
- Change an inlet wind velocity, an inlet water flow and measure a radiation quantity, a ventilation resistance, a hydraulic resistance in accordance with the KS R 1043.



【Photo 1】 Radiation Performance Test

Results of Test & Analysis

[Name of the Sample] : PA SERIES 120.2

[Results of the Test & Analysis] :

Specification	Cooling water Inlet Temp.(°C)	Cooling water Outlet Temp.(°C)	Air Inlet Temp. (°C)	Air Inlet Humidity (%)	Ventilation Resistance (Pa)	Hydraulic Resistance (kPa)	Radiation Quantity (kW)
Radiation Performance Test	84.49	66.08	24.71	54.30	107.28	9.12	6.25

[Results of Test (by water flow quantity)] :

(1) Flow Quantity Of Water : 5 ℓ/min, Hydraulic Resistance : 9.12 kPa

Air Flow (m/sec)	Cooling water Inlet Temp.(°C)	Cooling water Outlet Temp.(°C)	Air Inlet Temp.(°C)	Ventilation Resistance (Pa)	Radiation Quantity (kW)
3.0	84.40	67.80	24.71	52.37	5.64
5.0	84.49	66.08	24.71	107.28	6.25
10.0	84.26	63.40	24.78	317.34	7.11

(2) Flow Quantity Of Water : 3 ℓ/min, Hydraulic Resistance : 3.96 kPa

Air Flow (m/sec)	Cooling water Inlet Temp.(°C)	Cooling water Outlet Temp.(°C)	Air Inlet Temp.(°C)	Ventilation Resistance (Pa)	Radiation Quantity (kW)
5.0	84.87	62.10	24.91	107.92	4.62

(3) Flow Quantity Of Water : 5 ℓ/min, Hydraulic Resistance : 9.13 kPa

Air Flow (m/sec)	Cooling water Inlet Temp.(°C)	Cooling water Outlet Temp.(°C)	Air Inlet Temp.(°C)	Ventilation Resistance (Pa)	Radiation Quantity (kW)
5.0	84.40	66.15	24.72	107.28	6.20

(4) Flow Quantity Of Water : 10 ℓ/min, Hydraulic Resistance : 42.76 kPa

Air Flow (m/sec)	Cooling water Inlet Temp.(°C)	Cooling water Outlet Temp.(°C)	Air Inlet Temp.(°C)	Ventilation Resistance (Pa)	Radiation Quantity (kW)
5.0	84.87	72.86	24.70	106.70	8.10

Certificate of Test & Analysis Results

Reference No. 2007 - 620

- Name of Applicant : Jae-Sung, Park
- Name of Company : KOOLANCE. INC
- Address of Applicant : #430-817 801 Dongyong Venturitel 3 Cha, 202-4, Anyang 7-Dong, Manan-gu, Anyang-Si, Kyunggi-Do, S - Korea
- Date of Receipt : 16 . May . 2007
- Date of Test : 01 . June . 2007
- Name of the Sample : Radiator(WT-GTS240)
- Test Method : KS R 1043

• **Results of Test & Analysis**

Test Classify	Test Condition	Test Result	Test Method
Radiation Performance Test	Refer to Page 2	Refer to Page 3	KS R 1043

Test conducted by Jwa-in, SeonApproved by Taek-song, Nam

The above result is obtained from the test and analysis performed by our Institute on the sample submitted by the applicant.

Date. 8 . June . 2007

President

Korea Automotive Technology Institute

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Test Methods

【 Name of the Test 】 : Radiation Performance Test

【 Name of the Sample 】 : WT-GTS240

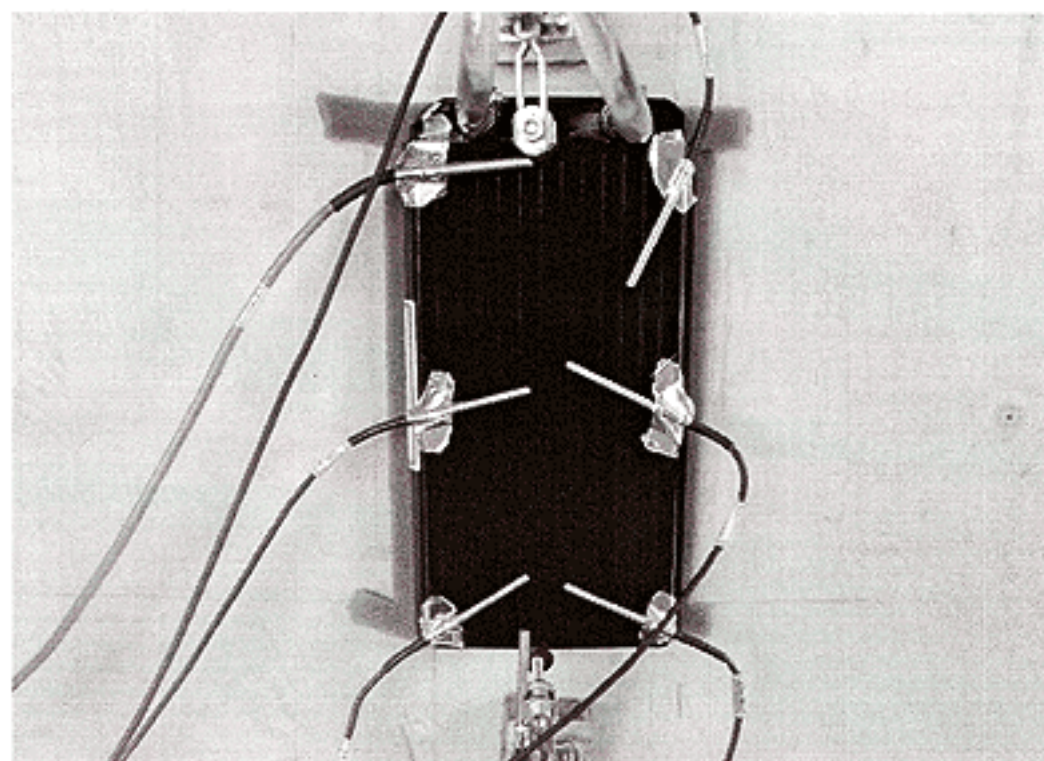
【 Sample Quantity 】 : 1 ea

【 Test Condition 】 :

- Water Temp : (84 ± 1) °C
- Flow Quantity Of Water : 5 ℓ/min
- Air Flow : 5.0 m/sec
- The Temp Diff. Between Hot Water&Air At Inlet 60deg

【 Test Method 】 :

- Installation of the sample on the test system which can measure the radiation performance of the radiator
- Change an inlet wind velocity, an inlet water flow and measure a radiation quantity, a ventilation resistance, a hydraulic resistance in accordance with the KS R 1043.



[Photo 1] Radiation Performance Test

Results of Test & Analysis

[Name of the Sample] : WT-GTS240

[Results of the Test & Analysis] :

Specification	Cooling water Inlet Temp.(°C)	Cooling water Outlet Temp.(°C)	Air Inlet Temp.(°C)	Air Inlet Humidity (%)	Ventilation Resistance (Pa)	Hydraulic Resistance (kPa)	Radiation Quantity (kW)
Radiation Performance Test	84.10	65.92	23.90	56.00	98.26	21.50	6.13

[Results of Test (by water flow quantity)] :

(1) Flow Quantity Of Water : 5 ℓ/min, Hydraulic Resistance : 21.50 kPa

Air Flow (m/sec)	Cooling water Inlet Temp.(°C)	Cooling water Outlet Temp.(°C)	Air Inlet Temp.(°C)	Ventilation Resistance (Pa)	Radiation Quantity (kW)
3.0	84.06	67.24	23.90	55.51	5.67
5.0	84.10	65.92	23.90	98.26	6.13
10.0	84.26	63.10	24.06	248.50	7.14

(2) Flow Quantity Of Water : 3 ℓ/min, Hydraulic Resistance : 7.73 kPa

Air Flow (m/sec)	Cooling water Inlet Temp.(°C)	Cooling water Outlet Temp.(°C)	Air Inlet Temp.(°C)	Ventilation Resistance (Pa)	Radiation Quantity (kW)
5.0	83.93	63.00	24.00	97.09	4.25

(3) Flow Quantity Of Water : 5 ℓ/min, Hydraulic Resistance : 21.60 kPa

Air Flow (m/sec)	Cooling water Inlet Temp.(°C)	Cooling water Outlet Temp.(°C)	Air Inlet Temp.(°C)	Ventilation Resistance (Pa)	Radiation Quantity (kW)
5.0	84.40	64.93	24.10	99.64	6.58

(4) Flow Quantity Of Water : 10 ℓ/min, Hydraulic Resistance : 74.53 kPa

Air Flow (m/sec)	Cooling water Inlet Temp.(°C)	Cooling water Outlet Temp.(°C)	Air Inlet Temp.(°C)	Ventilation Resistance (Pa)	Radiation Quantity (kW)
5.0	84.14	72.06	24.03	100.62	8.16

Certificate of Test & Analysis Results

Reference No. 2007 - 621

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- Address of Applicant : #430-817 801 Dongyong Venturestei 3 Cha, 202-4, Anyang 7-Dong, Manan-gu, Anyang-Si, Kyunggi-Do, S - Korea
- Date of Receipt : 16 . May. 2007
- Date of Test : 01 . June . 2007
- Name of the Sample : Radiator(INEX-2)
- Test Method : KS R 1043

• **Results of Test & Analysis**

Test Classify	Test Condition	Test Result	Test Method
Radiation Performance Test	Refer to Page 2	Refer to Page 3	KS R 1043

Test conducted by Jwa-in, JwaApproved by Taek-song, Nam

The above result is obtained from the test and analysis performed by our Institute on the sample submitted by the applicant.

Date. 8 . June . 2007

President

Korea Automotive Technology Institute

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Test Methods

【 Name of the Test 】 : Radiation Performance Test

【 Name of the Sample 】 : INEX-2

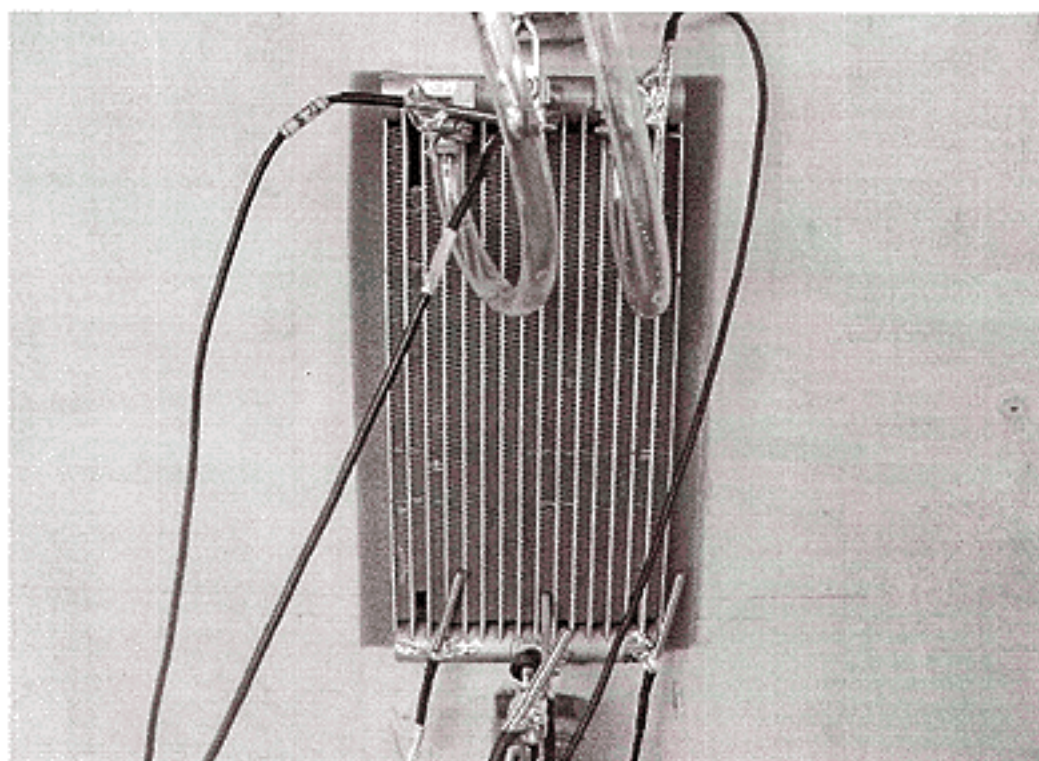
【 Sample Quantity 】 : 1 ea

【 Test Condition 】 :

- Water Temp : (84 ± 1) °C
- Flow Quantity Of Water : 5 ℓ/min
- Air Flow : 5.0 m/sec
- The Temp Diff. Between Hot Water&Air At Inlet 60deg

【 Test Method 】 :

- Installation of the sample on the test system which can measure the radiation performance of the radiator
- Change an inlet wind velocity, an inlet water flow and measure a radiation quantity, a ventilation resistance, a hydraulic resistance in accordance with the KS R 1043.



[Photo 1] Radiation Performance Test

Results of Test & Analysis

【 Name of the Sample 】 : INEX-2

【 Results of the Test & Analysis 】 :

Specification	Cooling water Inlet Temp.(°C)	Cooling water Outlet Temp.(°C)	Air Inlet Temp.(°C)	Air Inlet Humidity (%)	Ventilation Resistance (Pa)	Hydraulic Resistance (kPa)	Radiation Quantity (kW)
Radiation Performance Test	84.84	56.20	24.46	56.50	115.52	24.87	9.62

【 Results of Test (by water flow quantity) 】 :

(1) Flow Quantity Of Water : 5 ℓ/min, Hydraulic Resistance : 24.87 kPa

Air Flow (m/sec)	Cooling water Inlet Temp.(°C)	Cooling water Outlet Temp.(°C)	Air Inlet Temp.(°C)	Ventilation Resistance (Pa)	Radiation Quantity (kW)
3.0	84.86	58.55	24.59	60.80	8.86
5.0	84.84	56.20	24.46	115.52	9.62
10.0	84.78	53.85	24.52	314.40	10.41

(2) Flow Quantity Of Water : 3 ℓ/min, Hydraulic Resistance : 8.53 kPa

Air Flow (m/sec)	Cooling water Inlet Temp.(°C)	Cooling water Outlet Temp.(°C)	Air Inlet Temp.(°C)	Ventilation Resistance (Pa)	Radiation Quantity (kW)
5.0	84.51	54.46	24.20	115.33	6.07

(3) Flow Quantity Of Water : 5 ℓ/min, Hydraulic Resistance : 24.93 kPa

Air Flow (m/sec)	Cooling water Inlet Temp.(°C)	Cooling water Outlet Temp.(°C)	Air Inlet Temp.(°C)	Ventilation Resistance (Pa)	Radiation Quantity (kW)
5.0	84.83	55.95	24.50	114.93	9.79

(4) Flow Quantity Of Water : 10 ℓ/min, Hydraulic Resistance : 79.46 kPa

Air Flow (m/sec)	Cooling water Inlet Temp.(°C)	Cooling water Outlet Temp.(°C)	Air Inlet Temp.(°C)	Ventilation Resistance (Pa)	Radiation Quantity (kW)
5.0	84.14	63.89	24.28	115.33	13.76