

# DesiKhan

New Standard for Solving Automotive Lamp Fogging Issue

**DESIKHAN-HM**

June. 17<sup>th</sup>. 2020

The most sensitive part of customer's claim is "Automotive Lamps" Technically and Sentimentally



## ❖ Major chronic Field Claims in Head Lamps

1. Fogging & Condensation : 70%

2. Watertight Defect

3. Operational Defect

4. Lighting Defect

5. Lens Defect

※ Source : Korean Lamp Manufacturer

## DesiKhan - HM

### Moisture Absorbent for Automotive Lamp

Specially Designed only for Automotive Lamp

Performance

Lamp Internal Humidity Control

Absorption Quantity

> 150%

Release Quantity

Irreversible

Heat-Resistance

< 130°C

Life-Time

18~36 months



DesiKhan - HM

## DesiKhan - HM



DesiKhan-HM is placed inside the Access Cap



### 01. Economical

Significantly saving Production and Quality Cost



### 02. Safety

Better Clearance and Longer Auto. Lamp lifetime



### 03. Eco-Friendly

No Hazardous material to Human and Nature



## 01. Economical

Significant saving  
Production and  
Quality Cost

### DESIKHAN - HM



1. Economical Price  
No Coating Machine, No Coating Material, No Process Cost
2. Long Life-Time
3. Almost ZERO customer claim are reported  
for 3 years of transition period (0.006%~0.009%)
4. No Lamp Contamination
5. When Lamp fogging issue occurred  
: Just simply replace the DesiKhan-HM  
: No need to replace the entire Lamp

### Anti-Fog Coating



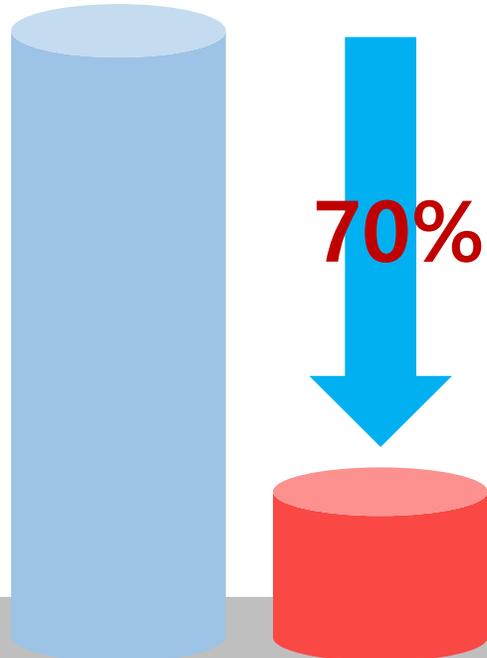
1. High Cost  
Coating machine, Coating material, Process cost
2. Short Life-time
3. Lots of customer claim reported
4. The Root cause of the Lamp Contamination
5. When Lamp fogging issue occurred  
: Non-repairable, Non-serviceable  
: Must replace the entire lamp (Costly)

# 3 Big Characteristics of DesiKhan-HM

- **Incredibly Huge benefit of DesiKhan-HM**

- **Best Innovative Supplier Award 2019**

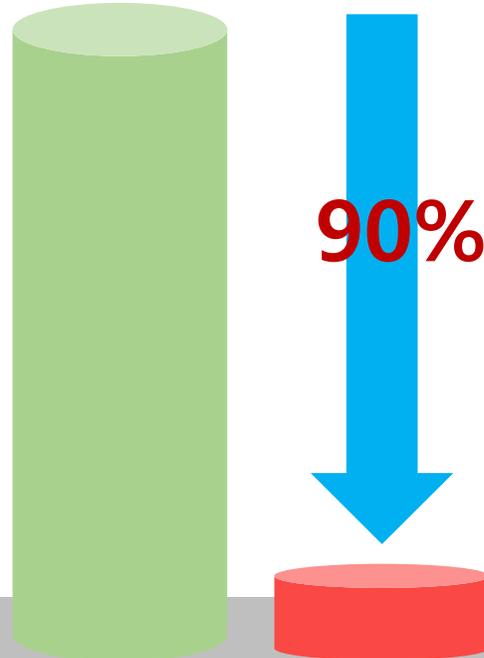
## Cost Reduction



Anti-Fog Coating

DesiKhan-HM

## Defect Reduction



Anti-Fog Coating

DesiKhan-HM

**HYUNDAI**  
MOTOR GROUP



- ✓ Thanks to the huge contribution to Hyundai and Kia Motors, HKMC awarded DesiKhan as the "Best Innovative Supplier" among such 3,500 companies.



## 02. Safety

Better Clearance and  
Longer Auto. Lamp lifetime

DESIKHAN - HM



Anti-Fog Coating



- 1. DK-HM helps Auto. lamps to be clearer and brighter.**
- 2. Prevent the decay & corrosion in Auto. Lamp.**
- 3. Prevent accidents caused by blurred and defected Auto. lamps.**



## 03. Eco-Friendly

No Hazardous material

### DESIKHAN - HM



1. Eco-Friendly Materials Used
2. Disposable as general trash

### Anti-Fog Coating



**Hazardous Material  
to Human and Environment  
ex) VOCs, Surfactant, Other chemical  
materials**

## ❖ New VOC regulations in China

On March 2020, China SAC\* issued a national standard for 7 VOC\*\*s emission limits. Most of them will enter into effect on December 1st, 2020.

\*Standardization Administration of China

\*\* Volatile Organic Compounds

### China Finalizes 7 National Standards for VOCs Control

Mar 10, 2020 Horace Wang



These standards set the limits of total VOC contents and special volatile hazardous substances in different products, and most of them will enter into effect on December 1, 2020.

<https://chemical.chemlinked.com/news/chemical-news/china-finalizes-7-national-standards-for-vocs-control>

## 中华人民共和国国家标准 national standards of People's Republic of China 公告

2020年第2号

附件文件下载：2020年第2号

关于批准发布《木器涂料中有害物质限量》等7项国家标准的公告

国家市场监督管理总局（国家标准化管理委员会）批准《木器涂料中有害物质限量》等7项国家标准，现予以公布。

国家市场监督管理总局 国家标准化管理委员会

序号	标准编号	标准名称	代替标准号	实施日期
1	GB 18581-2020	木器涂料中有害物质限量	GB 18581-2009, GB 24410-2009	2020-12-01
2	GB 18582-2020	建筑用墙面涂料中有害物质限量	GB 18582-2008, GB 24408-2009	2020-12-01
3	GB 24409-2020	车辆涂料中有害物质限量	GB 24409-2009	2020-12-01
4	GB 30981-2020	工业防护涂料中有害物质限量	GB 30981-2014	2020-12-01
5	GB 33372-2020	胶粘剂挥发性有机化合物限量	GB/T 33372-2016	2020-12-01
6	GB 38507-2020	油墨中挥发性有机化合物(VOCs)含量的限值		2021-04-01
7	GB 38508-2020	清洗剂挥发性有机化合物含量限值		2020-12-01

GB 24409-2020

Restriction of hazardous in vehicle coatings

GB 24409-2009

Dec.1<sup>st</sup>. 2020

<http://std.sacinfo.org.cn/gnoc/queryInfo?id=DBFEEDF05290B415CFBBEAA40EA24D78>

- Since 2017 when Hyundai and Kia Motors began to use DesiKhan-HM, they **no longer** process the **anti-fog coating**.
- Hyundai and Kia Motors **save** the production & quality **cost** significantly every single year.



- GENESIS EQ900
- Granduer
- Santafe
- Sonata
- Avante
- :



**KIA MOTORS**

- Stinger
- Sorento
- K-7,K-5,K3
- Sportage
- Morning
- :





Mercedes-Benz

Since Oct. 2016

- Mercedes-S Coupe
- Benz AMG Project-1



Since Jun. 2019

- Malibu
- Cruz
- Trax



THACO BUS

Since Aug. 2018

- Bluesky 120s
- Garden 79s
- Meadow 85s
- Mobihome 120sl



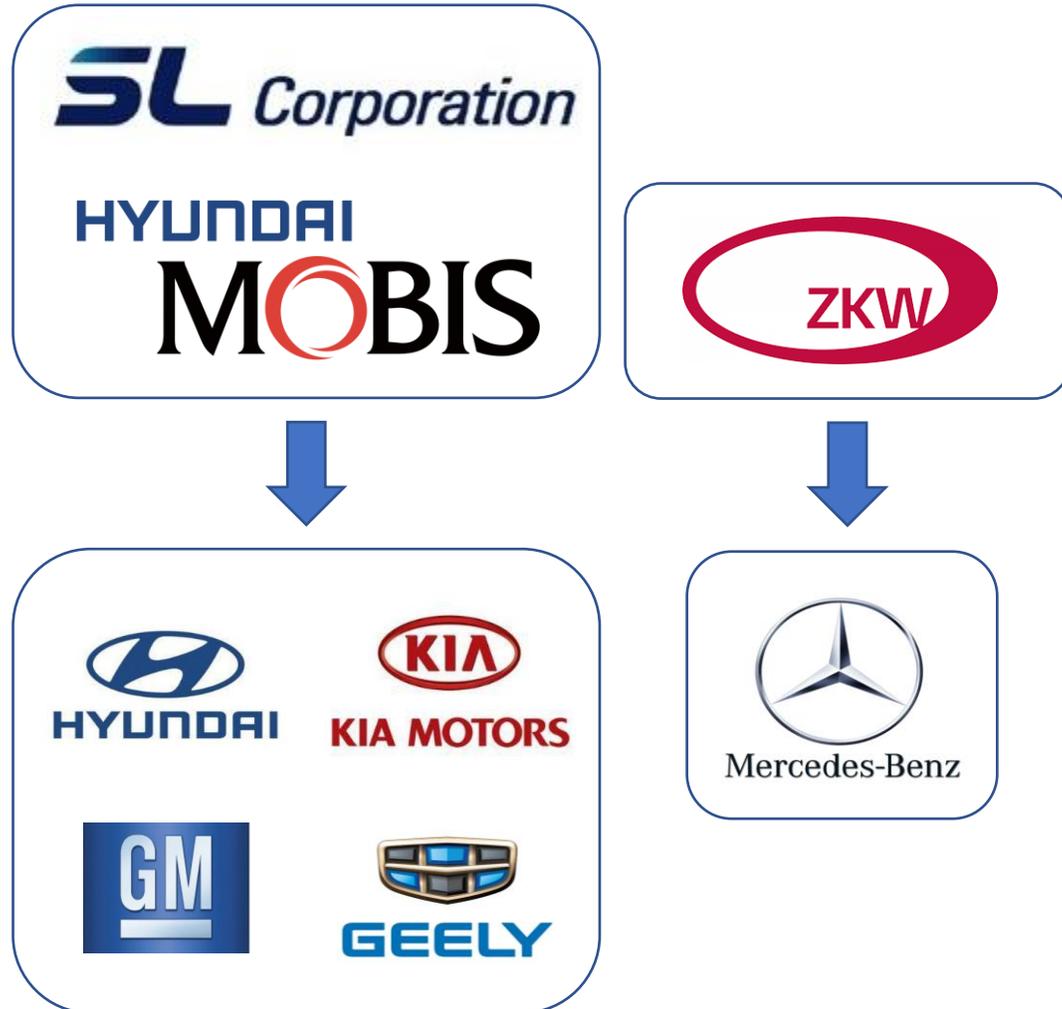
GEELY

Since Jul. 2019

- Emgrand 7



❖ Lamp Makers currently using DK-HM



❖ Lamp Makers successfully finished testing DK-HM



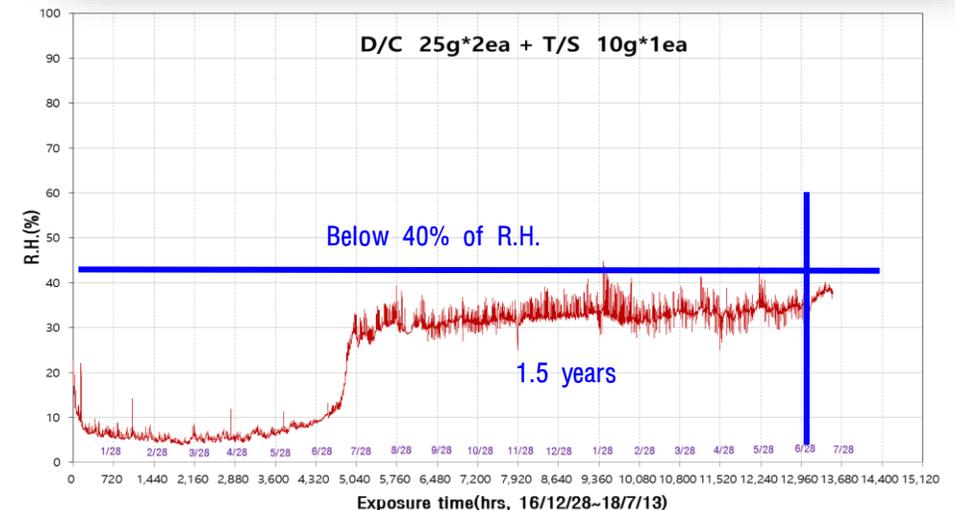
❖ Lamp Makers currently testing DK-HM



## 1. Environmental Outdoor Exposure Test

- Expose the lamp with DesiKhan-HM during the test period
- Location : Daejeon, S. Korea
- Test Period : 2016. 12. 28 ~ 2018. 06. 13(13,500 hrs, 1.54 years)
- Every lamp has a sensor for monitoring the humidity and temperature in real time.
- Average temperature and humidity of Daejeon city

Spring (Mar~May)	13°C	59%
Summer (Jun~Aug)	24°C	76%
Fall (Sep~Nov)	14°C	75%
Winter (Dec~Feb)	-3°C	66%



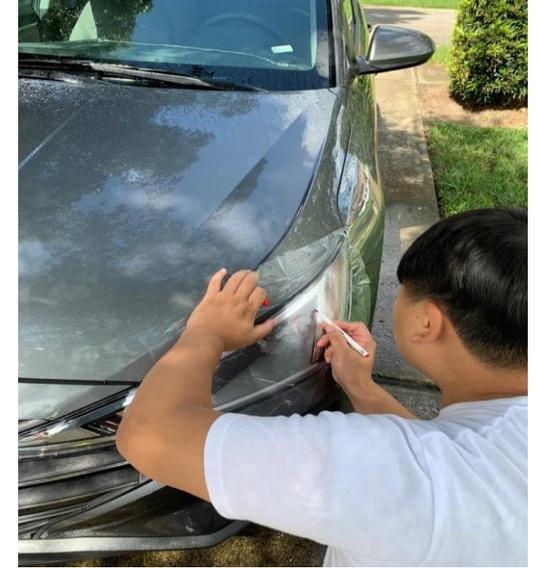
Relative Humidity of Inner Lamps according to HM

## 2. Field Test(Overseas : USA, China)

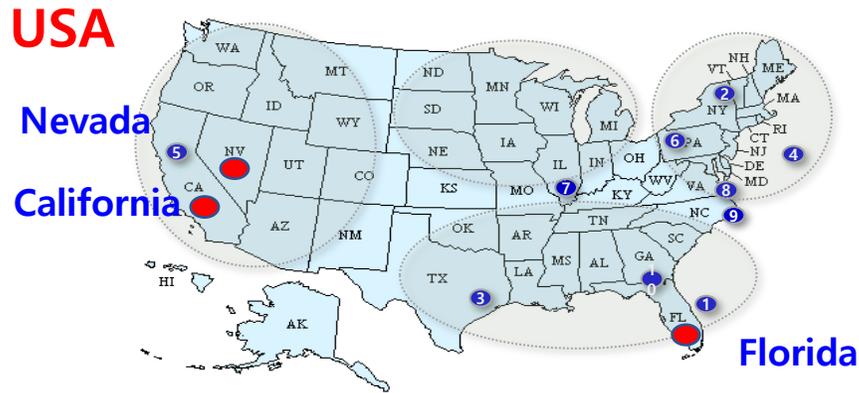
### ❖ Test Method

Monitoring the humidity, temperature, etc under the different environment

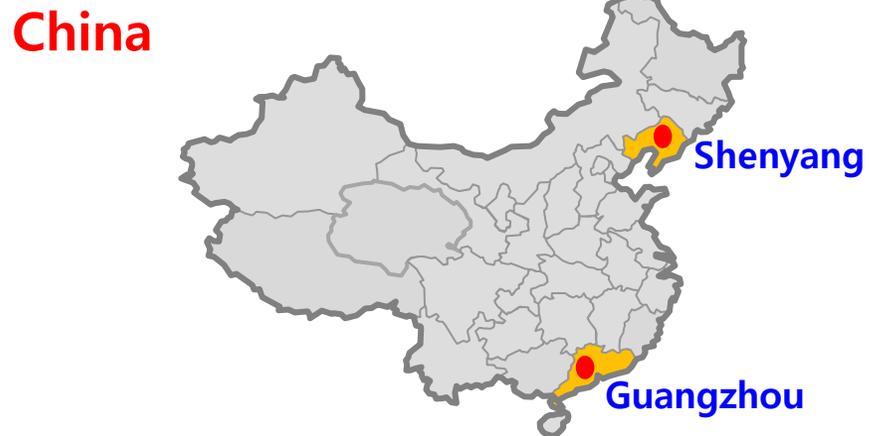
- Vehicle used by actual customer
- Vehicle for test
  - with DesiKhan-HM
  - without DesiKhan-HM
- Environmental Outdoor Exposure Test



## 2. Field Test(Overseas : USA, China)



USA 1 <sup>st</sup> (2019)	Location & Test Period	Florida(3.18~3.22), Nevada(3.25~3.29)
	Test Condition	Florida(13 ~ 34°C/22 ~ 87%, water temp. 16 ~ 20°C) Nevada(6 ~ 39 °C/7 ~ 63%, water temp. 15 ~ 20°C)
USA 2 <sup>nd</sup> (2019)	Location & Test Period	Florida(8.22~8.31), California(9.01~9.06)
	Test Condition	Florida(23 ~ 34°C/54 ~ 95%, water temp. 27~29°C) California(18~29°C/53~77%, water temp. 26~28°C)



China 1 <sup>st</sup> (2018)	Location & Test Period	Guangzhou(6.25~6.30), Shenyang(7.1~7.6)
	Test Condition (Summer)	Guangzhou (27~34°C/57~84%, water temp. 30°C) Shenyang (25~29°C/40~50%, water temp. 24°C)
China 2 <sup>nd</sup> (2019)	Location & Test Period	Guangzhou(1.7~1.11), Shenyang(1.14~1.18)
	Test Condition (Winter)	Guangzhou (13 ~ 33°C/43 ~ 89%, water temp. 17 ~ 20°C) Shenyang (-12 ~ 23 °C/16 ~ 73%, water temp. 6 ~ 9°C)

## 3. Field Test with Taxis (South Korea)

- Purpose : Monitoring performance and durability of **DesiKhan-HM** (every month)
- Period : Mar. 14, 2019 ~ Dec. 31, 2021 (3 years' project)
- Location : Middle Region(30EA), Eastern Coast(5EA), Western Coast(5EA)
- Test items (inside the lamp): Temperature, Moisture absorption rate (%), Relative humidity and dew point



Access Cap





## ① Harshest Test Condition

- Drive more than 16 hours & 300km per day, 25days per month
- Drive anywhere even unpaved road
- Car wash every 1~2 days

## ② Test Result

- No fogging & Condensation Field claim
- Lamp Clearance Improved
- Bulb Life-Time lengthened from 6 months to longer than 1 year
- Prevent the decay & corrosion in Automotive Lamp

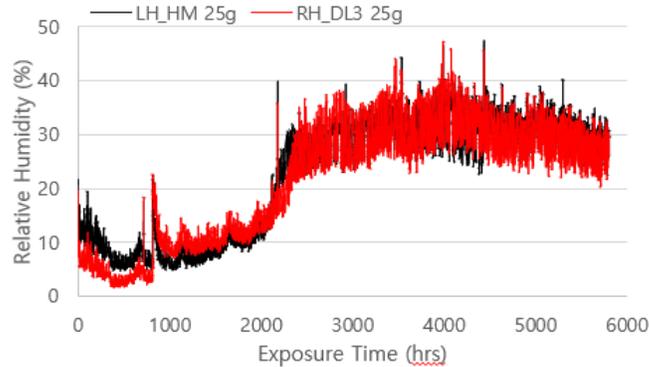
## □ 60바 9327(SL)

DesiKhan

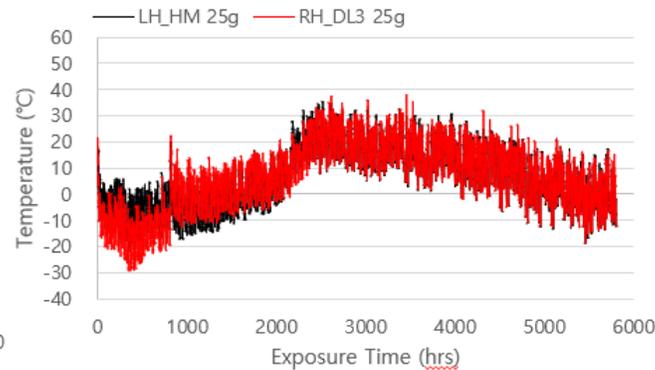
60바 9327						
측정일	경과일	LH		RH		주행거리
		HM 25g		DL3 25g		
		흡습제 중량	26.54	흡습제 중량	26.78	
		중량 (g)	흡습율 (%)	중량 (g)	흡습율 (%)	
05월 26일	0	70.68	0.00	69.94	0.00	49,620
07월 22일	57	81.87	42.16	80.60	39.81	59,235
08월 22일	88	83.75	49.25	82.48	46.83	63,948
09월 25일	121	85.14	54.48	83.32	49.96	69,453
10월 24일	150	85.22	54.79	83.33	50.00	73,626
11월 21일	178	85.34	55.24	83.34	50.04	78,370
12월 20일	207	85.19	54.67	83.23	49.63	83,650

- Car Plate No. : 60바 9327
- Test Period : 2019.05.26 ~ Current
- Driver's Name : Han Dong Hwui (010-123-4567)

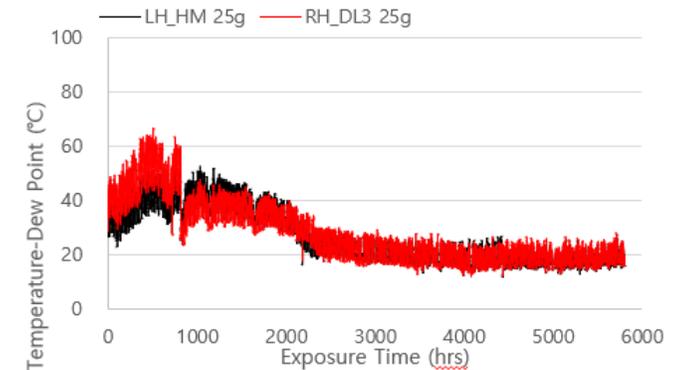
Lamp Internal Relative Humidity



Dew Point



Temperature - Dew point

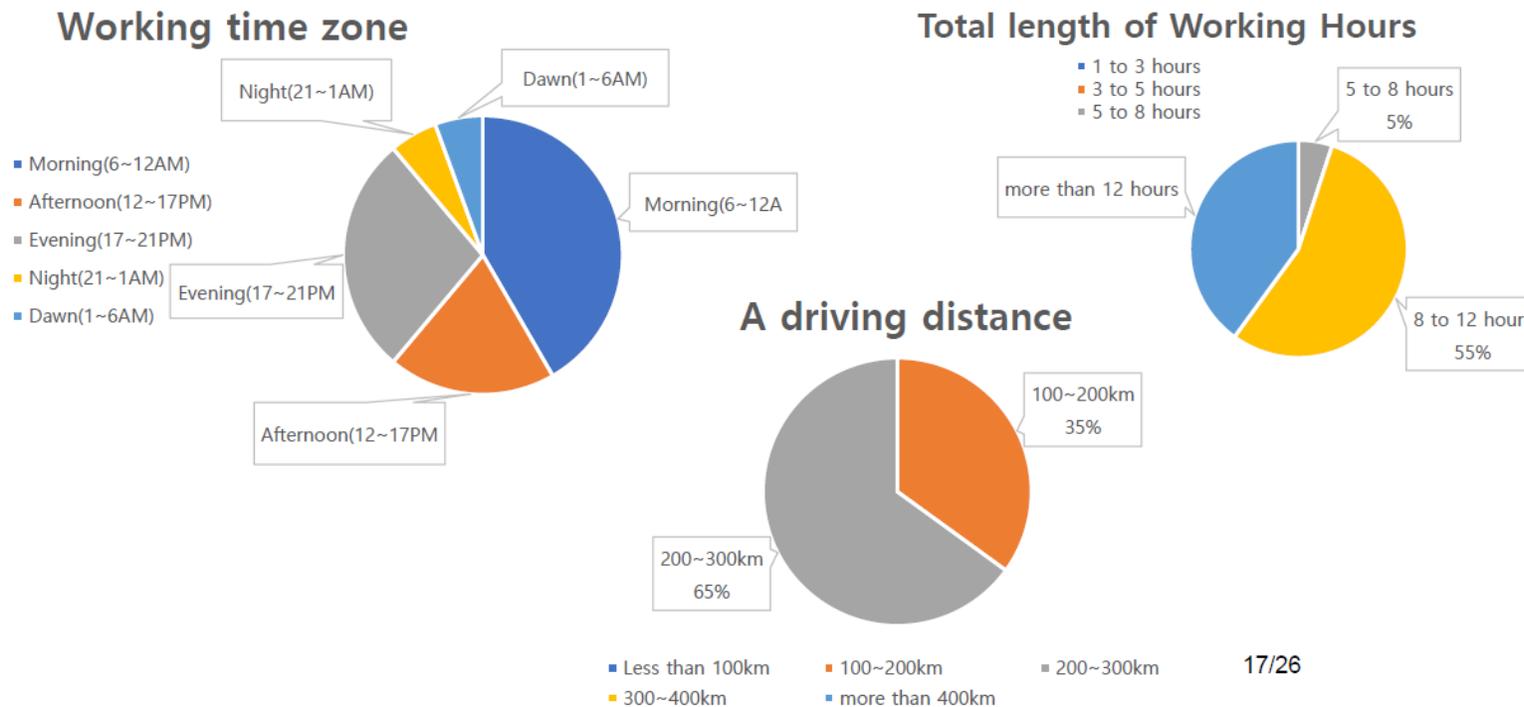


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## Taxi Driver's Survey Data

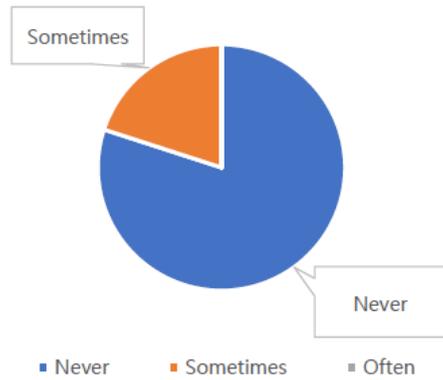
**DesiKhan**  
2020.01.21

Purpose	Survey of Driving environment and driver's findings
Period	May 2019 ~ January 2020 (11th)
Subject	20 Taxi drivers (Vehicle model : Grandeur, Sonata, 2017 ~ 2018)

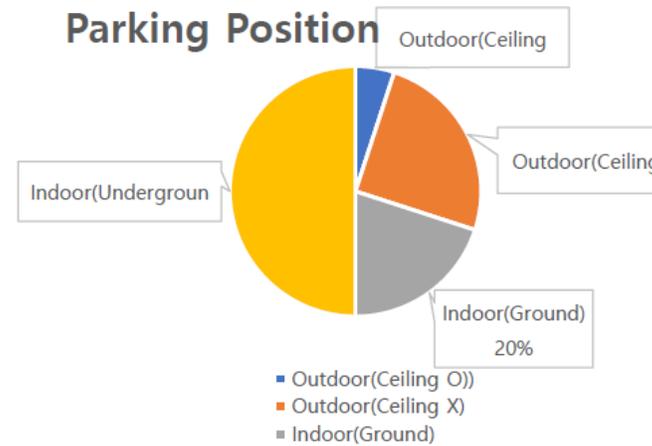


**DesiKhan**  
2020.01.21

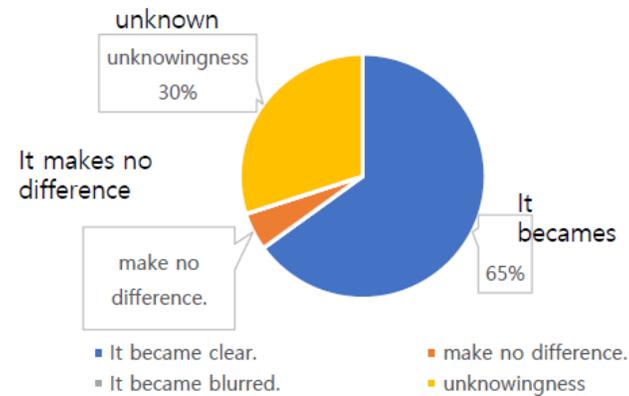
### Driving on Unpaved road



### Parking Position



### Improvement of Clearness



### Frequency of bulb replacement



\* (Better Clearness/Illuminance, Longer Life-time of bulbs)

Monthly Monitoring Schedule is fixed until the end of 2021  
Any time, you are kindly invited to visit DesiKhan factory & see the test

No.	2020 Taxi Test Schedule	No.	2021 Taxi Test Schedule
12th	March. 24 <sup>th</sup> (Tue) AM 11(15 Taxis), PM 2(15 Taxis)	19th	January. 26 <sup>th</sup> (Tue) AM 11(15 Taxis), PM 2(15 Taxis)
13th	April. 28 <sup>th</sup> (Tue) AM 11(15 Taxis), PM 2(15 Taxis)	20th	March. 23 <sup>rd</sup> (Tue) AM 11(15 Taxis), PM 2(15 Taxis)
14th	June. 23 <sup>rd</sup> (Tue) AM 11(15 Taxis), PM 2(15 Taxis)	21st	May. 25 <sup>th</sup> (Tue) AM 11(15 Taxis), PM 2(15 Taxis)
15th	July. 21 <sup>st</sup> (Tue) AM 11(15 Taxis), PM 2(15 Taxis)	22nd	July. 20 <sup>th</sup> (Tue) AM 11(15 Taxis), PM 2(15 Taxis)
16th	August. 25 <sup>th</sup> (Tue) AM 11(15 Taxis), PM 2(15 Taxis)	23rd	August. 24 <sup>th</sup> (Tue) AM 11(15 Taxis), PM 2(15 Taxis)
17th	September 22 <sup>nd</sup> (Tue) AM 11(15 Taxis), PM 2(15 Taxis)	24th	September. 28 <sup>th</sup> (Tue) AM 11(15 Taxis), PM 2(15 Taxis)
18th	November 24 <sup>th</sup> (Tue) AM 11(15 Taxis), PM 2(15 Taxis)	25th	November 23 <sup>rd</sup> (Tue) AM 11(15 Taxis), PM 2(15 Taxis)

## History

- 1972. 02. Founded Dongdo New Tech Co., Ltd.
- 1994. 08. Founded ZERUST KOREA
- 2010. 08. Started "Corrosion Inhibitor & Desiccant" business
- 2014. 12. Founded DesiKhan Co., Ltd.
- 2015. 03. Acquired ISO 9001 & ISO 14001
- 2016. 06. Founded R&D Center
- 2016. 08. Started mass production of DesiKhan HM (automotive lamp desiccant) for HKMC
- 2017. 07. Acquisition of 5 Patents regarding Lamp Desiccant
- 2018. 09. Founded DesiKhan Asia(Joint Venture)
- 2019. 03. Founded EU Office
- 2019. 07. Moved to new factory
- 2019.10. Acquisition of US Patent regarding Lamp Desiccant
- 2019. 11. Designated as Cutting-edge Technology & Company
- 2019. 12. Awarded Excellent Patent(Chemistry)
- 2020. 01. Awarded Best Innovative Supplier 2019 by Hyundai Motors
- 2020.10. Planning to found DesiKhan China(Manufacture/Sales)



R&D Center



Head Quarter and Factory



R&D Center

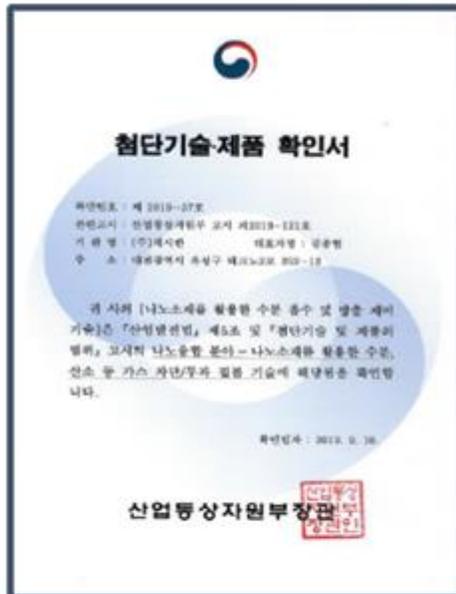


Production Line



Warehouse

## Major Certificates in 2019



Cutting-edge  
Technology  
(Minister of Industry)



Cutting-edge Company  
(Minister of Science  
and Technology)

**HYUNDAI**  
MOTOR GROUP



2019 Award for Best Innovative  
Supplier by Hyundai Motors  
among 3500 companies

## Major Patents in 2019



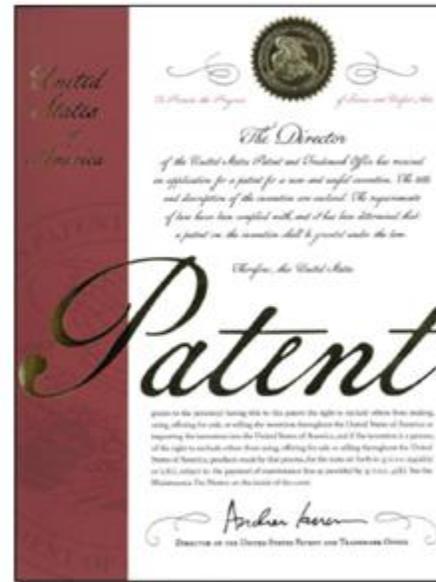
Lamp Desiccant



Lamp Desiccant



Lamp Desiccant



Lamp Desiccant (US)



2019 Best Patent Award  
(Chemistry field)  
(Out of 330 companies)





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Thank you

**DesiKhan**