



# Test report

**Smartguard 睿盾<sup>®</sup>**

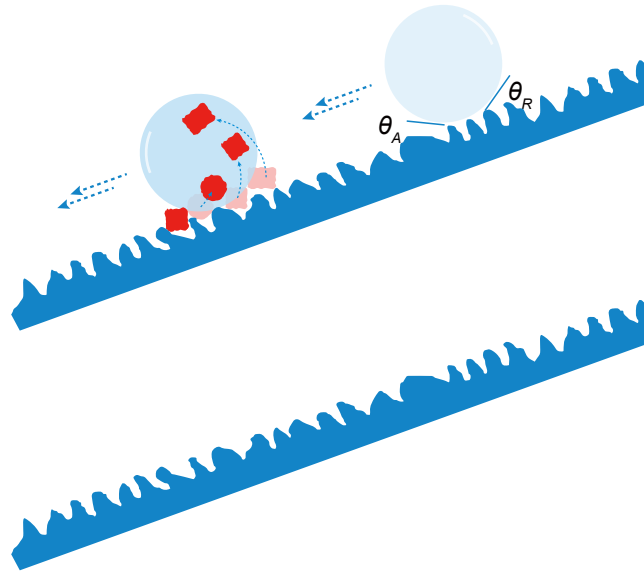
Committed to providing a full range of glass easy cleaning products  
From Smartguard coating supply, customized Smartguard production line equipment, display equipment, production tools, to personalized service solutions, we provide one-stop glass easy clean technology service.

# 睿盾纳米 Smartguard

Achieve the peak for easy glass surface treatment technology

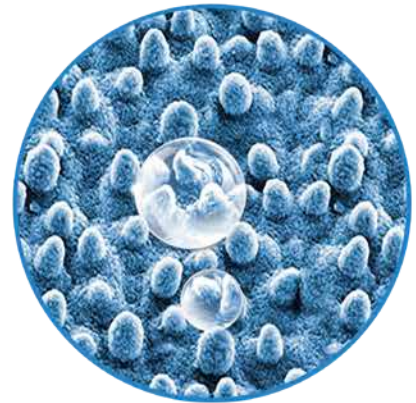
## Technology Overview

The unique modified group of the coating molecule can greatly improve the hydrophobic and oleophobic ability of the coating, and form a microstructure similar to the surface of the lotus leaf, allowing the glass to achieve an easy decontamination effect similar to the lotus leaf effect.



运用标准的施工方法，让涂料与玻璃表面的二氧化硅充分结合，通过分子间的相互作用和新形成涂层内部网状结构变化等一系列的化学反应，最终以化学共价键形式键合在玻璃表面，形成全透光纳米级厚度的超薄保护层。该保护层完全覆盖在玻璃表面，从物理层面上隔绝玻璃表面与污染物的接触，可以尽可能长时间的保持玻璃的洁净度，不仅更易清洁，且牢固耐擦洗，满足人们对高品质生活的追求。

Using standard coating application methods, the coating is fully combined with the silica on the glass surface, and through a series of chemical reactions such as molecular interactions and changes in the internal network structure of the newly formed coating, the final bonding is in the form of chemical covalent bonds. On the surface of the glass, an ultra-thin protective coating with full light transmission nanometer thickness is formed. The protective coating completely covers the glass surface, physically isolates the glass surface from contact with pollutants, and can maintain the cleanliness of the glass for a long time. The glass is not only easier to clean, but also firm and resistant to scrubbing, It satisfies people's pursuing of high-quality life.

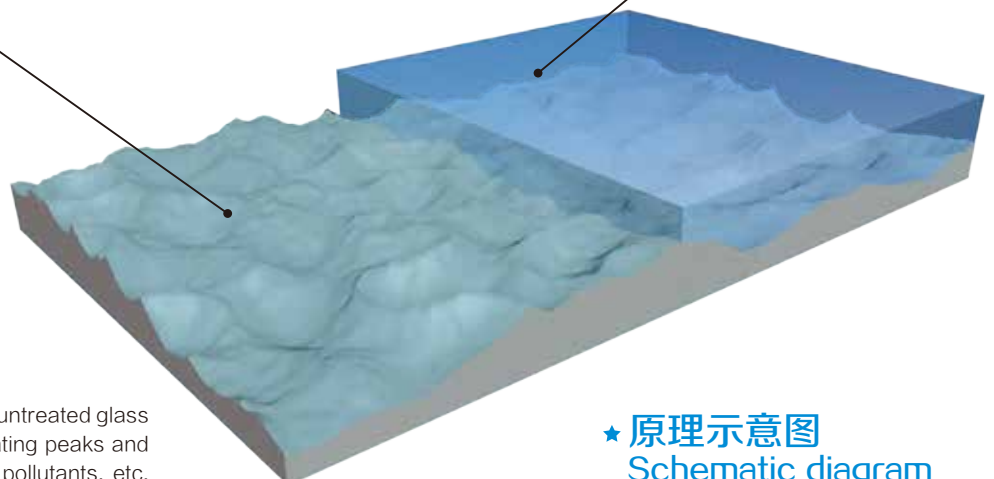


睿盾纳米 涂层微观结构  
Smartguard Nano Coating  
Micro Structure

## 普通玻璃表面微观结构 Untreated Glass Surface Micro Structure

在微观世界中，未经处理的玻璃表面并不是平整、光滑的，存在着高低起伏的峰谷。微小的灰尘颗粒、污垢水、污染物等会侵入到这些峰谷之中，造成难以清洁的污渍。

In the microscopic world, the surface of untreated glass is not flat and smooth, there are undulating peaks and valleys. Tiny dust particles, dirt water, pollutants, etc. will invade these peaks and valleys, causing stains that are difficult to clean.



★ 原理示意图  
Schematic diagram



## Conclusion of test report

Smartguard anti-soiling & Easy-to-clean coating series products have passed authoritative test of SGS, School of Materials Science and Engineering, Zhejiang University. The performance and specification achieve to China GB / T37830-2019 and RoHS Directive(EU); .

- Wear resistance passed 100000 times of test;
- Pass Detergent, Muriatic Acid, Window Cleaner resistance;
- The product is green and environmentally friendly, meets the requirements of the EU ROHS directive, and does not contain harmful fluorine-containing PFOA, PFOS compounds and their derivatives.

Smarter Surface Create More Value

**深圳市睿盾纳米新材料有限公司**

Shenzhen Smartguard Nano Material Co., Ltd.

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CUSTOMER NAME: SHENZHEN SMARTGUARD NANO MATERIAL CO., LTD.  
ADDRESS: RM.9B, JIALITAI BUILDING, YANSHAN ROAD, NANSHAN DIST.,  
SHENZHEN, CHINA.

Sample Name : SMARTGUARD BRAND ANTI-SOILING AND EASY-TO-CLEAN  
COATED GLASS

Above information and sample(s) was/were submitted and confirmed by the client. SGS, however, assumes no responsibility to verify the accuracy, adequacy and completeness of the sample information provided by client.

\*\*\*\*\*

SGS Ref. No. : CP21-004445

Date of Receipt : Jan 29, 2021

Testing Start Date : Jan 29, 2021

Testing End Date : Mar 15, 2021

Test result(s) : For further details, please refer to the following page(s)  
(Unless otherwise stated the results shown in this test report refer only to the sample(s) tested)

Signed for  
SGS-CSTC Standards Technical  
Services Co., Ltd. GZ Branch Testing  
Center

Winnie Tan  
Authorized signatory



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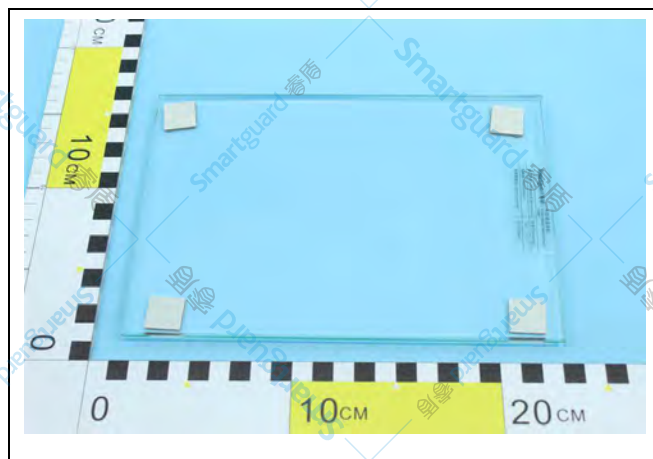
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## Summary of Results:

No.	Test Item	Test Method	Result	Conclusion
1	Wear Resistance Test	With reference to GB/T 3920-2008 and client's requirement	No visible change in appearance and the easy-cleaning effect keeps well	Pass
2	Detergent Resistance	AAMA 2605-20 Section 8.7.4	No loss of adhesion, no blistering or other visible change	Pass
3	Muriatic Acid Resistance	AAMA 2605-20 Section 8.7.1	No visual change	Pass
4	Window Cleaner Resistance	AAMA 2605-20 Section 8.7.5 & ASTM D3359-17	No blistering or other visible change, no removal of film	Pass

Note: Pass : Meet the requirements;  
 Fail : Does not meet the requirements;  
 / : Not Apply to the judgment.

## Original Sample Photo:



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**1. Test Item: Wear Resistance Test**

Sample Description: Easy-to-clean coated glass

Test Method: With reference to GB/T 3920-2008 and client's requirement

Test Condition:

Load: 150g

Rubbing Material: 2 pieces of dustless cloth (provided by client)

Rubbing Finger Specification: φ10 mm

Rubbing Speed: 60cpm

Friction Times: 100000 times (once for a complete back and forth)

Stroke: 60mm

At the end of every 2500 times, observe the visual change in appearance and compare the scrubbed area with the untested sample for the easy-cleaning effect by diluted red ink solution.

Test Result:

Times	Test Results	Client's requirement	Conclusion
2500	No visible change in appearance and the easy-cleaning effect keeps well	After 100000 times of testing, the easy-cleaning effect of the tested sample was basically kept consistent with untested sample.	/
5000	No visible change in appearance and the easy-cleaning effect keeps well		
7500	No visible change in appearance and the easy-cleaning effect keeps well		
10000	No visible change in appearance and the easy-cleaning effect keeps well		
12500	No visible change in appearance and the easy-cleaning effect keeps well		
15000	No visible change in appearance and the easy-cleaning effect keeps well		
17500	No visible change in appearance and the easy-cleaning effect keeps well		
20000	No visible change in appearance and the easy-cleaning effect keeps well		



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Times	Test Results	Client's requirement	Conclusion
22500	No visible change in appearance and the easy-cleaning effect keeps well	After 100000 times of testing, the easy-cleaning effect of the tested sample was basically kept consistent with untested sample	/
25000	No visible change in appearance and the easy-cleaning effect keeps well		
27500	No visible change in appearance and the easy-cleaning effect keeps well		
30000	No visible change in appearance and the easy-cleaning effect keeps well		
32500	No visible change in appearance and the easy-cleaning effect keeps well		
35000	No visible change in appearance and the easy-cleaning effect keeps well		
37500	No visible change in appearance and the easy-cleaning effect keeps well		
40000	No visible change in appearance and the easy-cleaning effect keeps well		
42500	No visible change in appearance and the easy-cleaning effect keeps well		
45000	No visible change in appearance and the easy-cleaning effect keeps well		
47500	No visible change in appearance and the easy-cleaning effect keeps well		
50000	No visible change in appearance and the easy-cleaning effect keeps well		
52500	No visible change in appearance and the easy-cleaning effect keeps well		
55000	No visible change in appearance and the easy-cleaning effect keeps well		
57500	No visible change in appearance and the easy-cleaning effect keeps well		



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Times	Test Results	Client's requirement	Conclusion
60000	No visible change in appearance and the easy-cleaning effect keeps well	After 100000 times of testing, the easy-cleaning effect of the tested sample was basically kept consistent with untested sample	/
62500	No visible change in appearance and the easy-cleaning effect keeps well		
65000	No visible change in appearance and the easy-cleaning effect keeps well		
67500	No visible change in appearance and the easy-cleaning effect keeps well		
70000	No visible change in appearance and the easy-cleaning effect keeps well		
72500	No visible change in appearance and the easy-cleaning effect keeps well		
75000	No visible change in appearance and the easy-cleaning effect keeps well		
77500	No visible change in appearance and the easy-cleaning effect keeps well		
80000	No visible change in appearance and the easy-cleaning effect keeps well		
82500	No visible change in appearance and the easy-cleaning effect keeps well		
85000	No visible change in appearance and the easy-cleaning effect keeps well		
87500	No visible change in appearance and the easy-cleaning effect keeps well		
90000	No visible change in appearance and the easy-cleaning effect keeps well		
92500	No visible change in appearance and the easy-cleaning effect keeps well		
95000	No visible change in appearance and the easy-cleaning effect keeps well		



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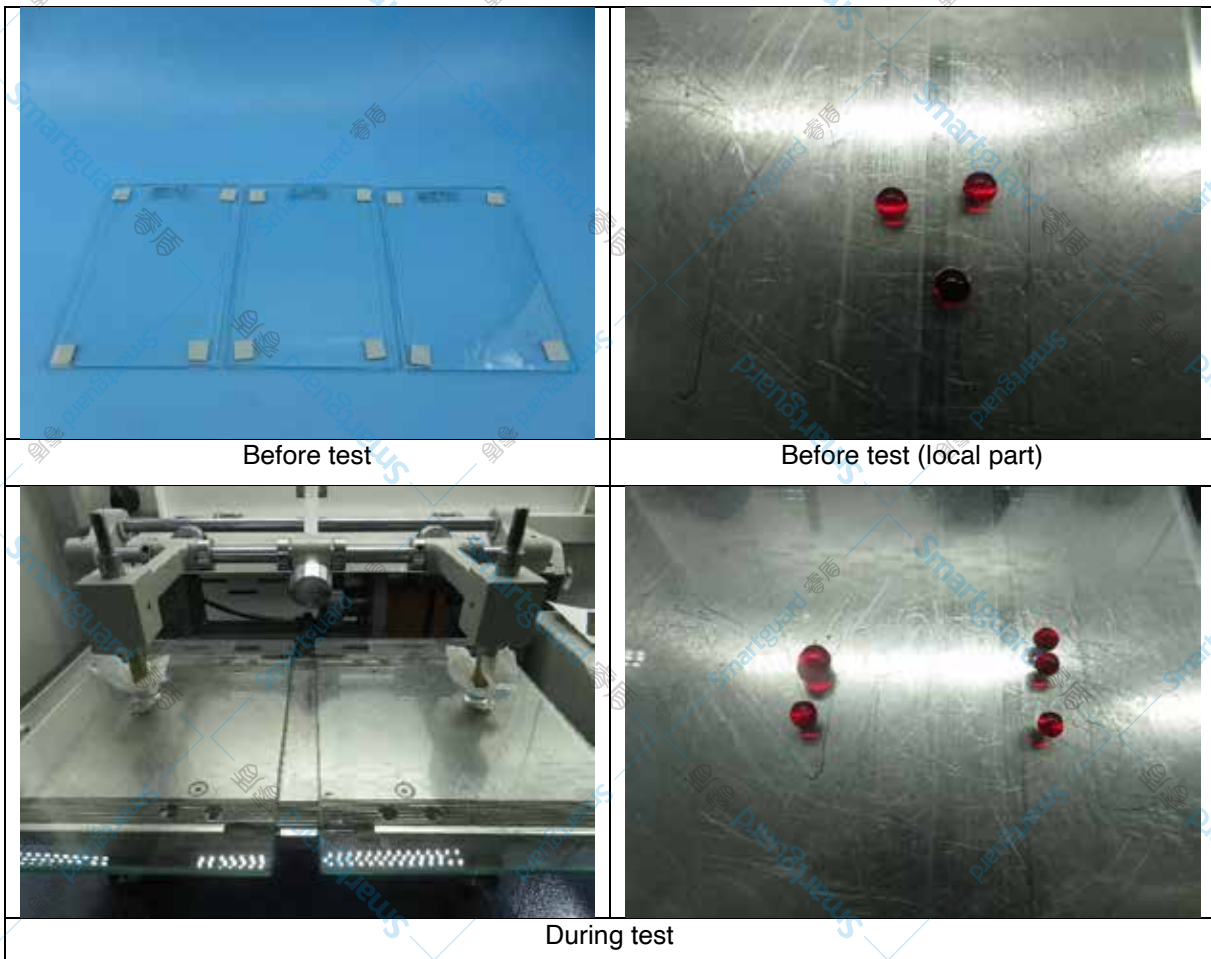
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Times	Test Results	Client's requirement	Conclusion
97500	No visible change in appearance and the easy-cleaning effect keeps well	After 100000 times of testing, the easy-cleaning effect of the tested sample was basically kept consistent with untested sample	/
10000	No visible change in appearance and the easy-cleaning effect keeps well		Pass

Test Photo:



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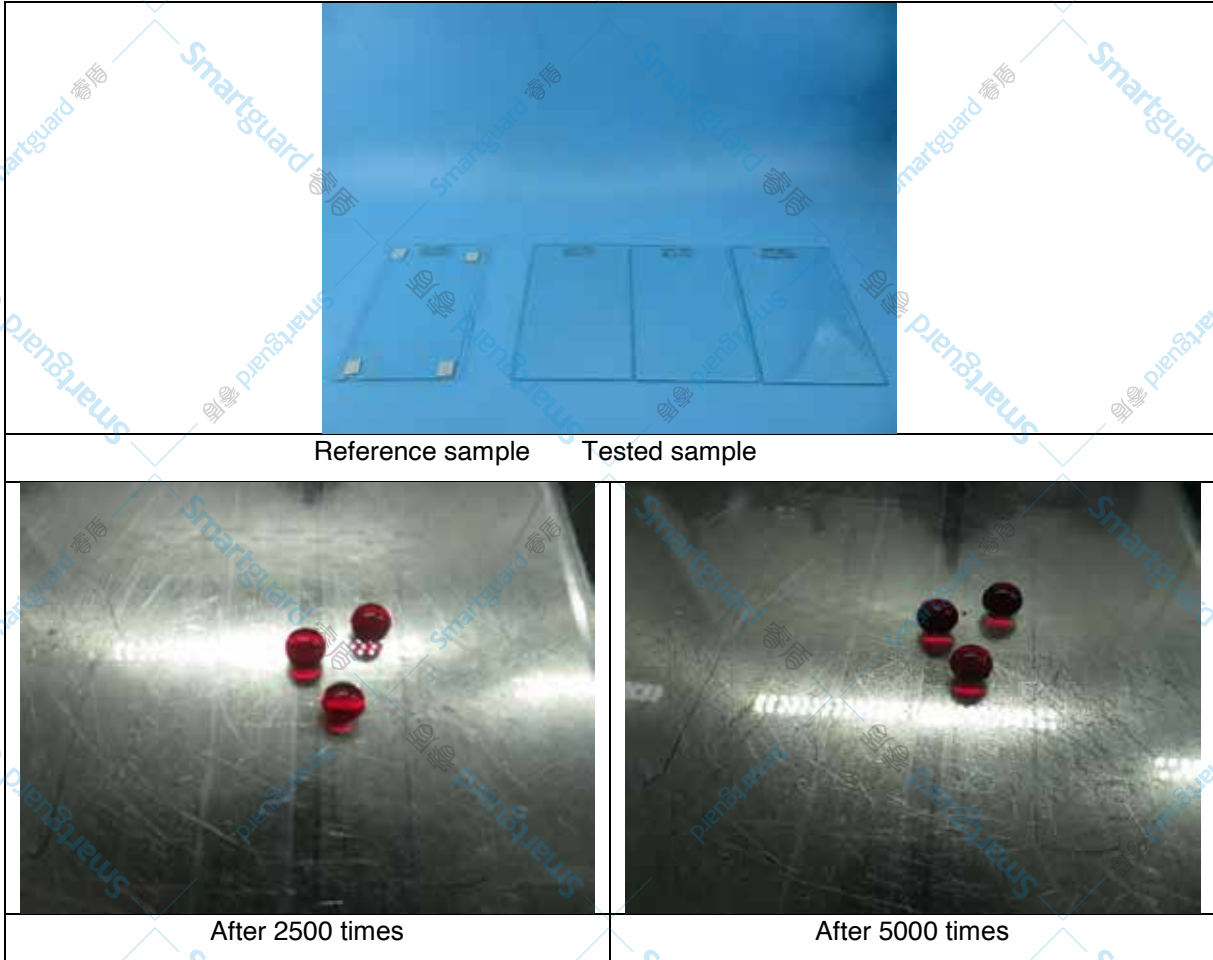
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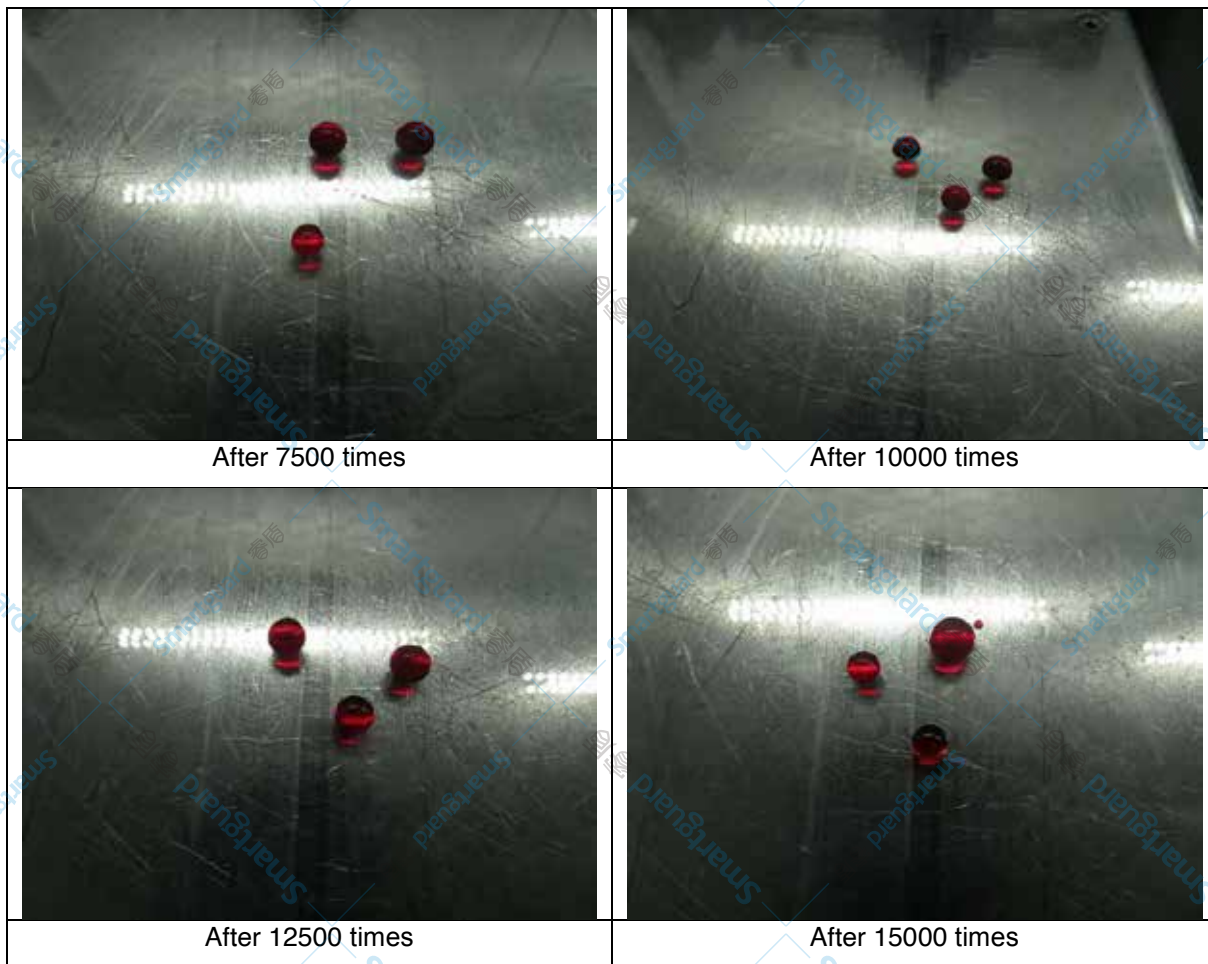
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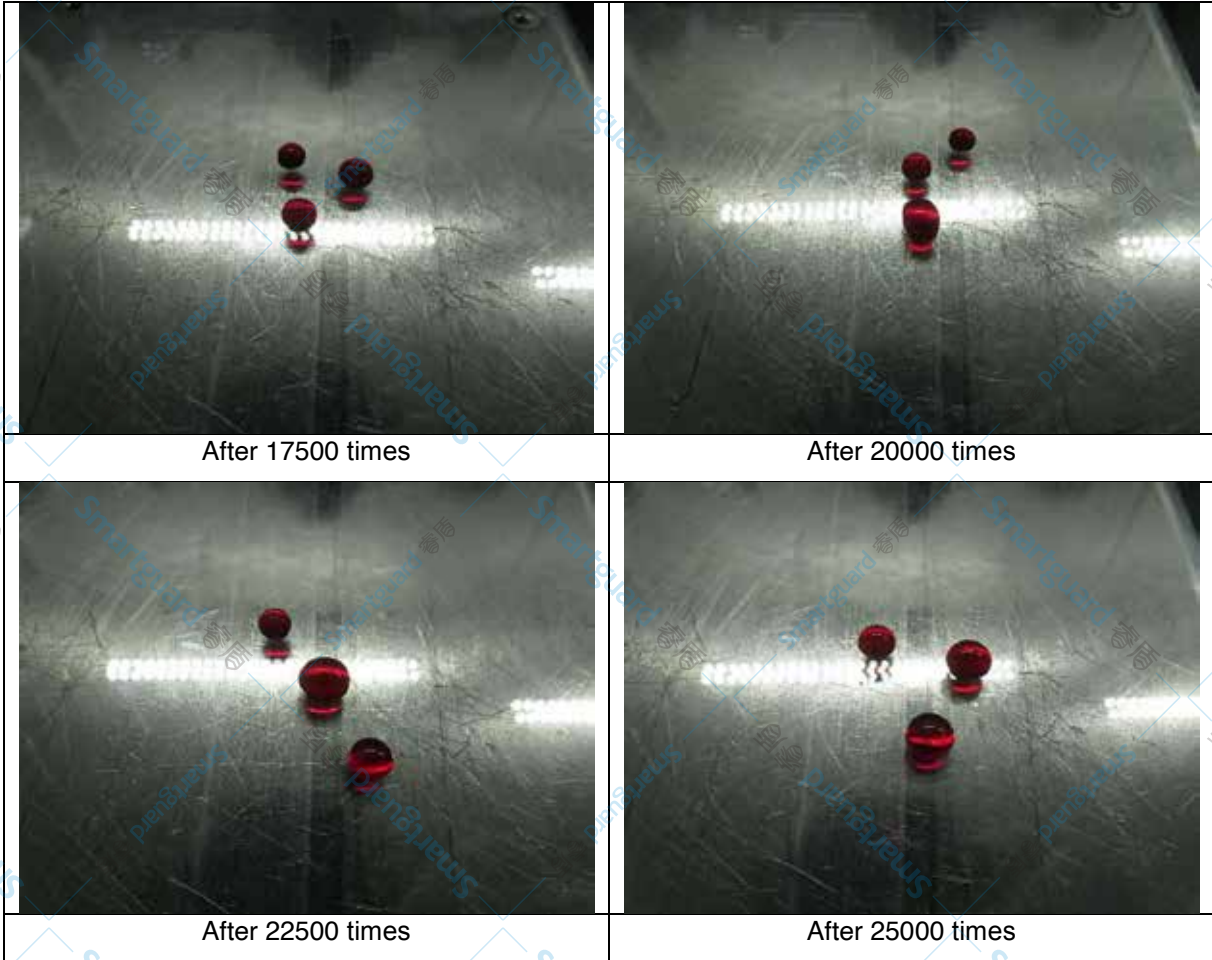
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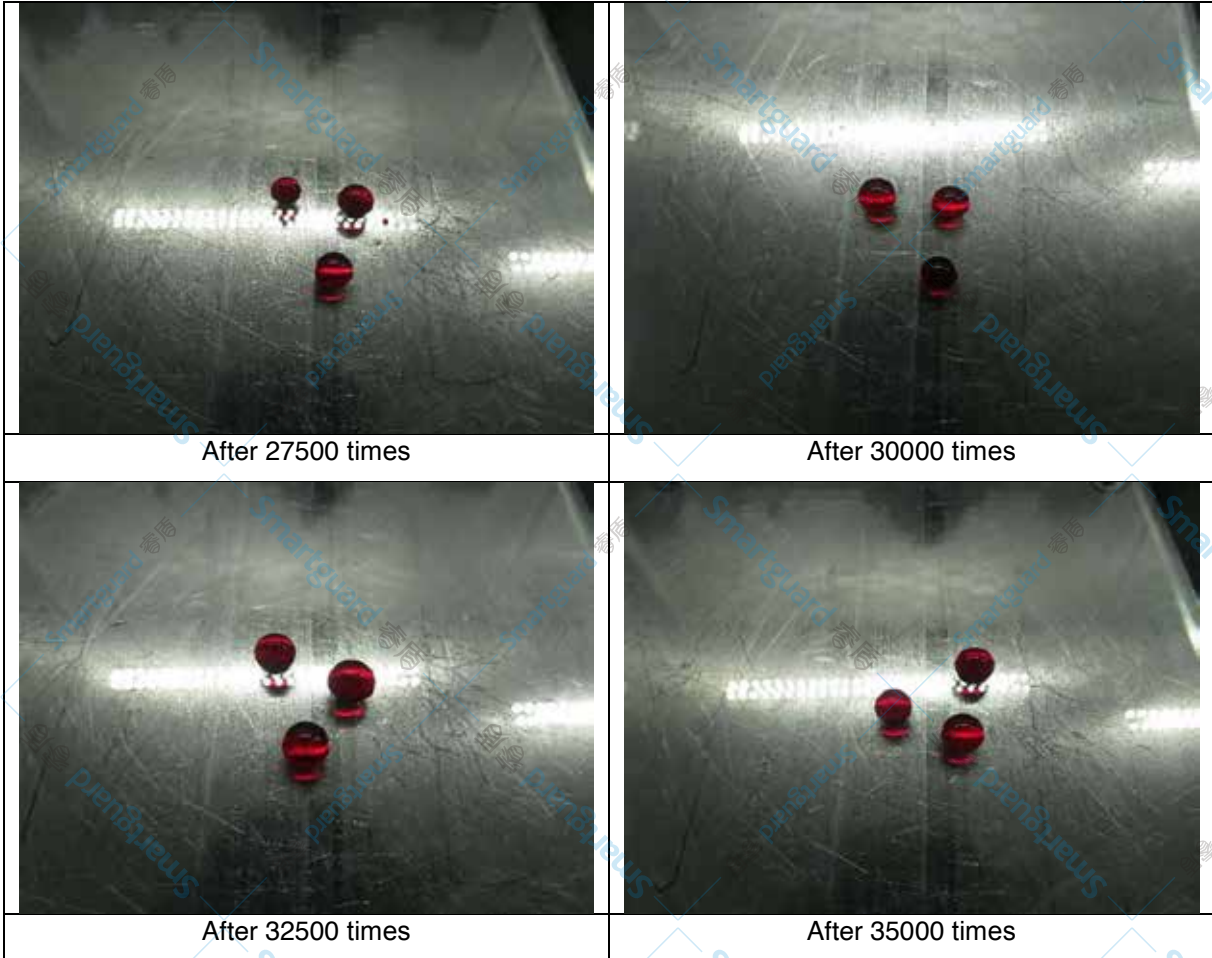
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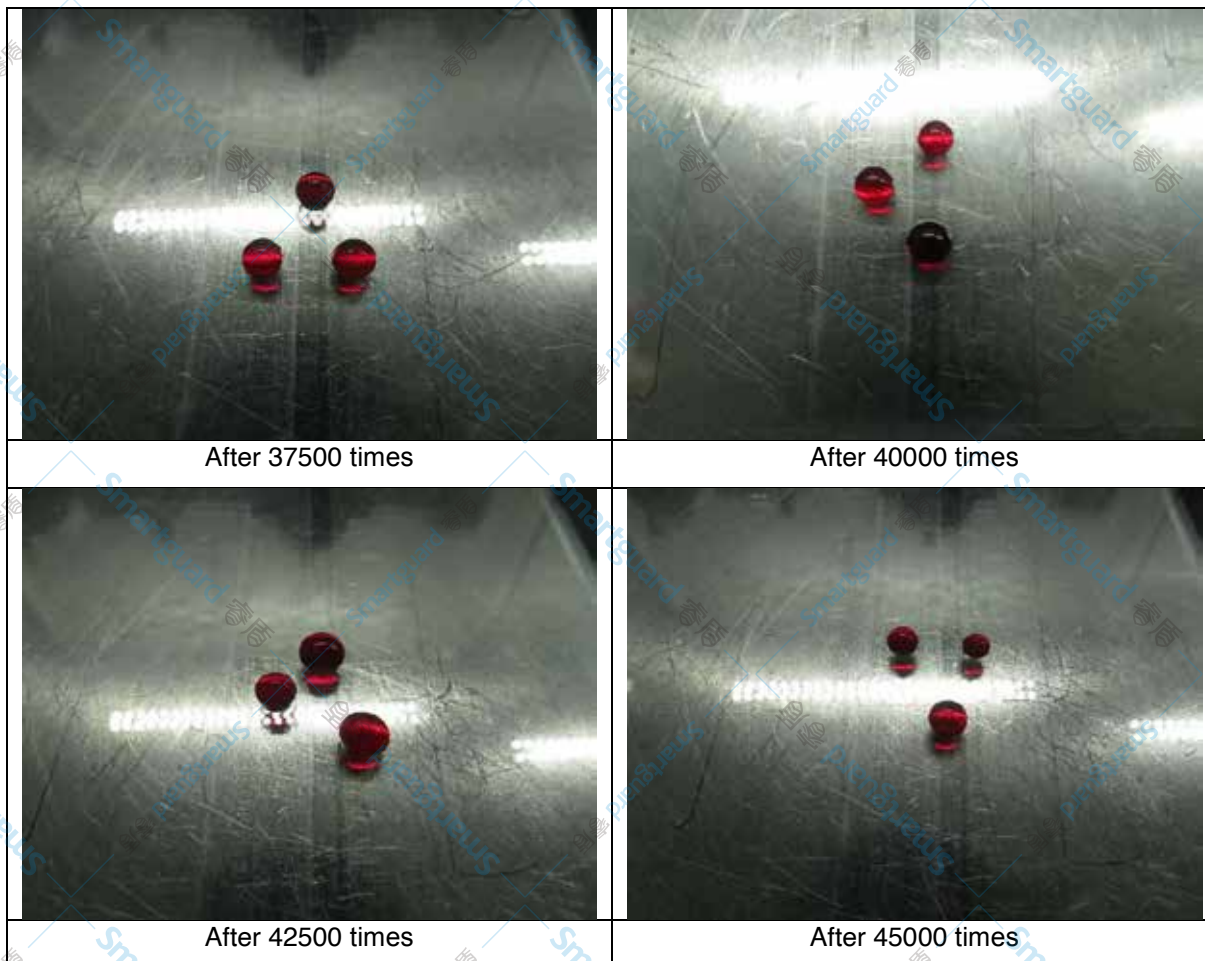
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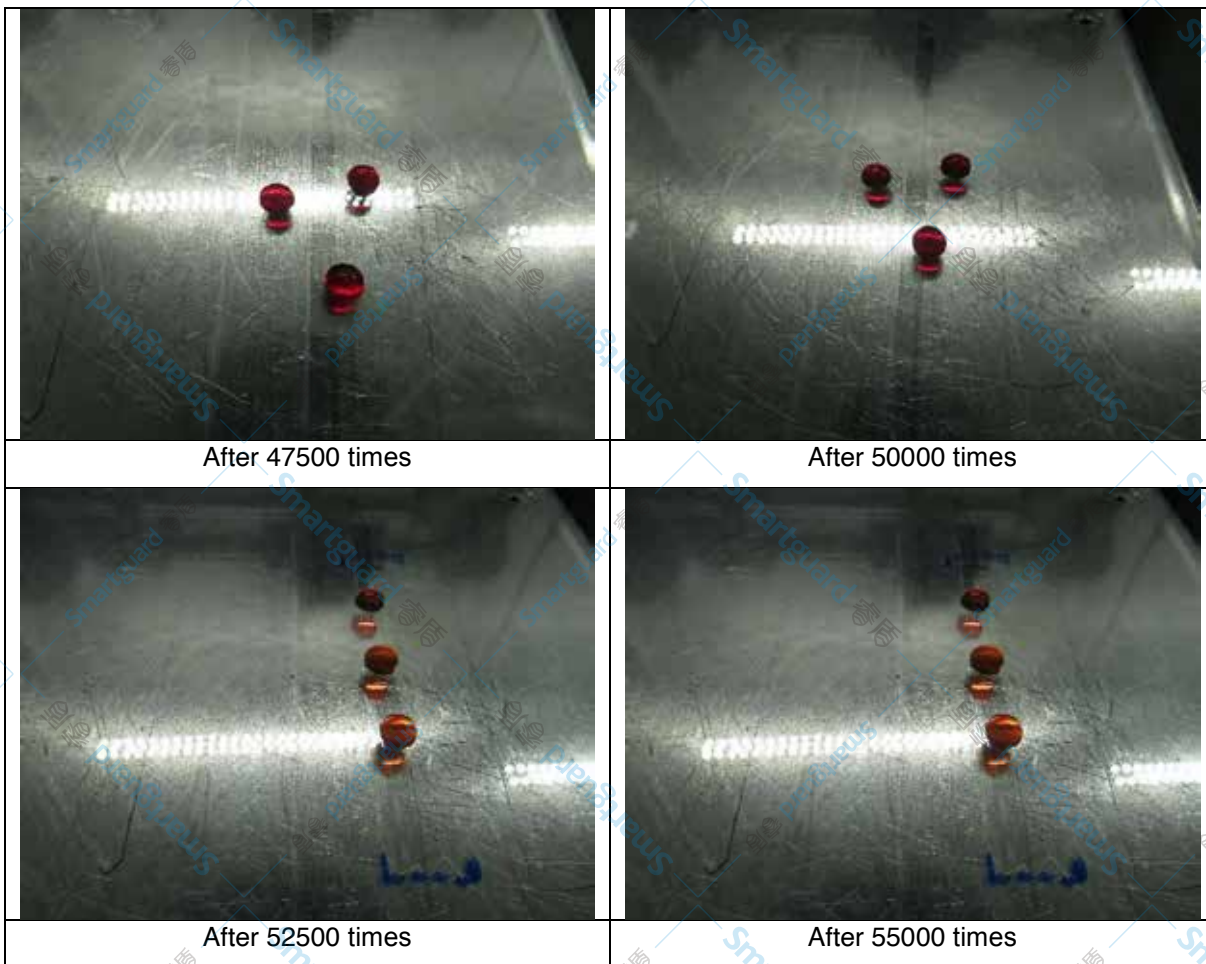
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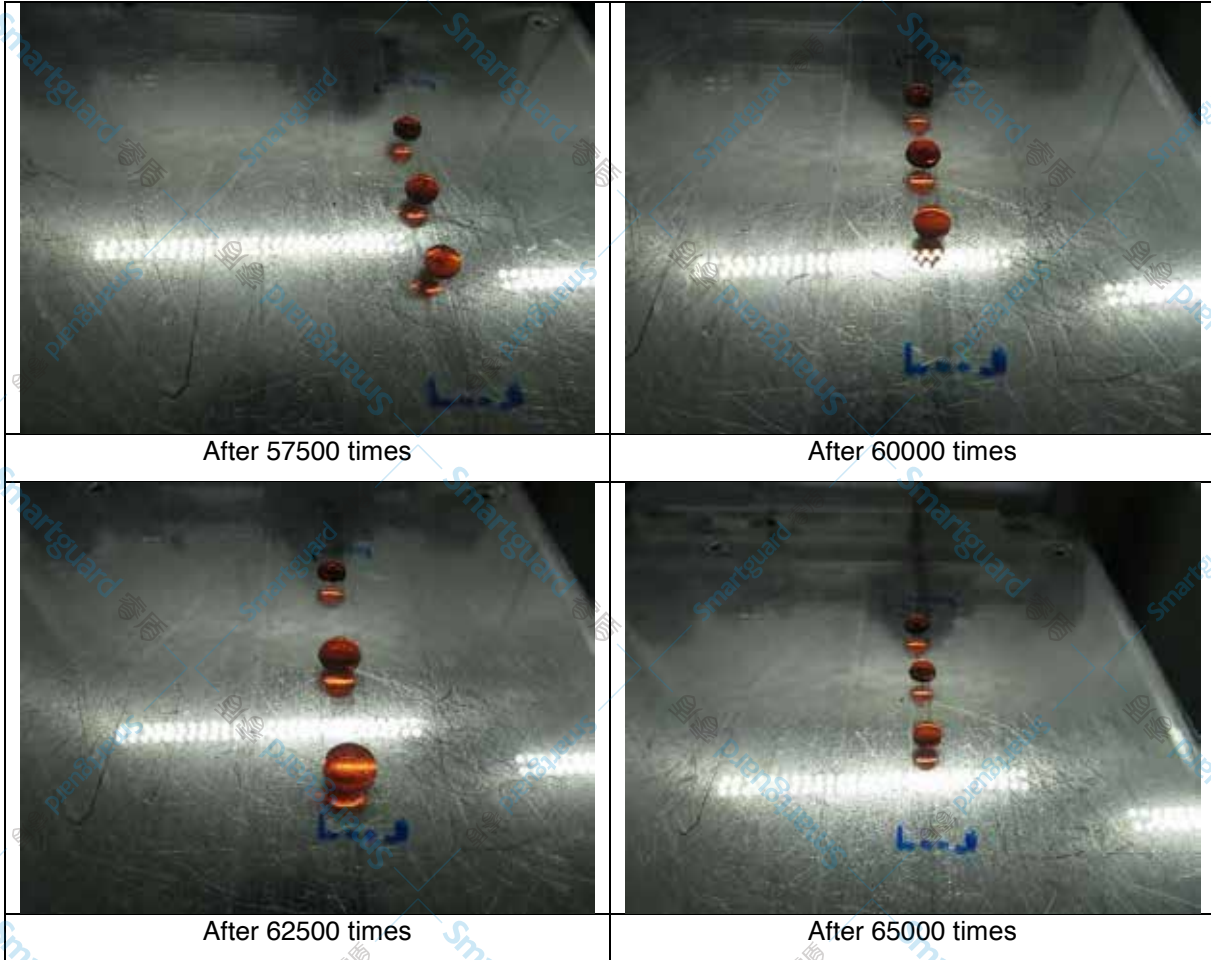
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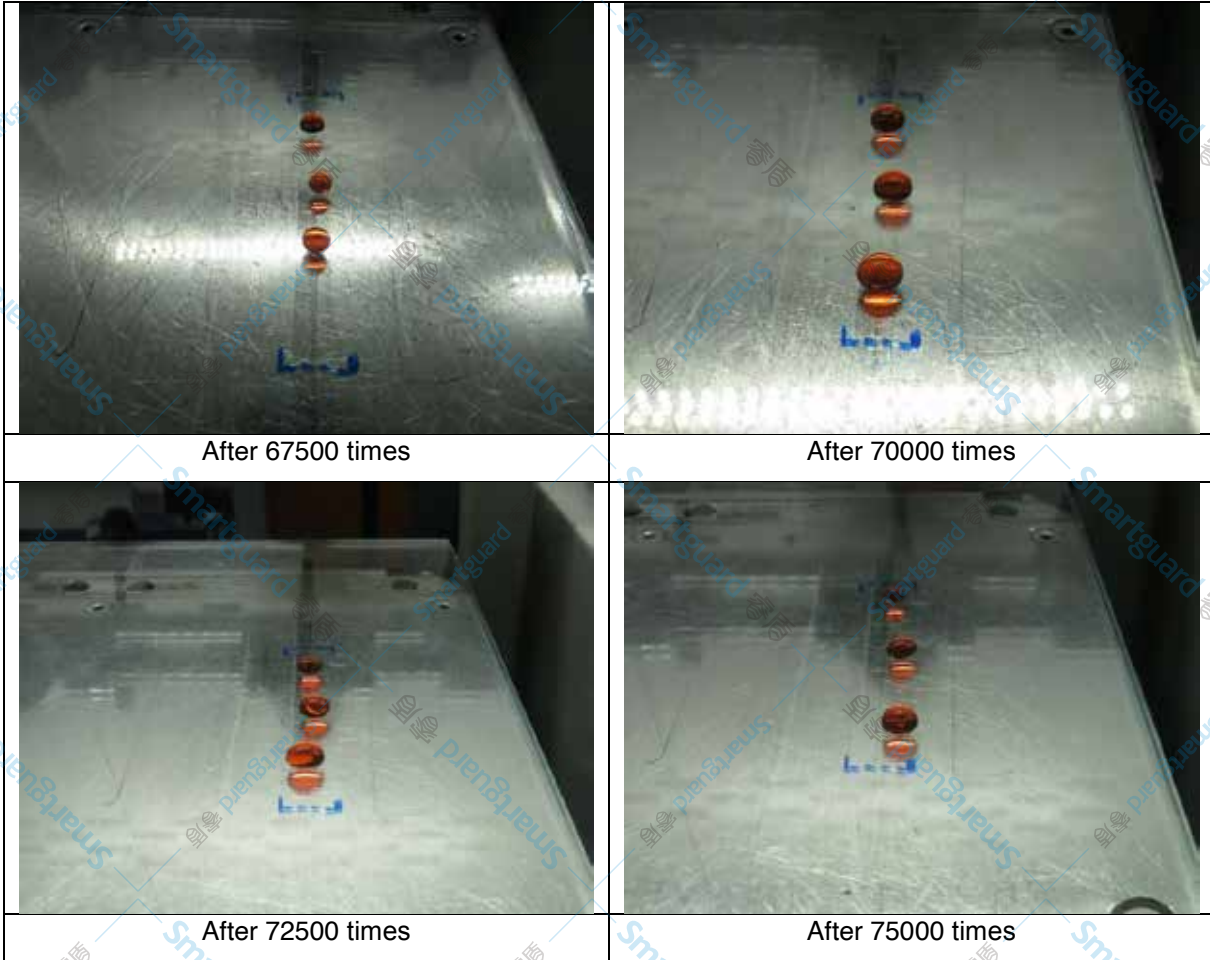


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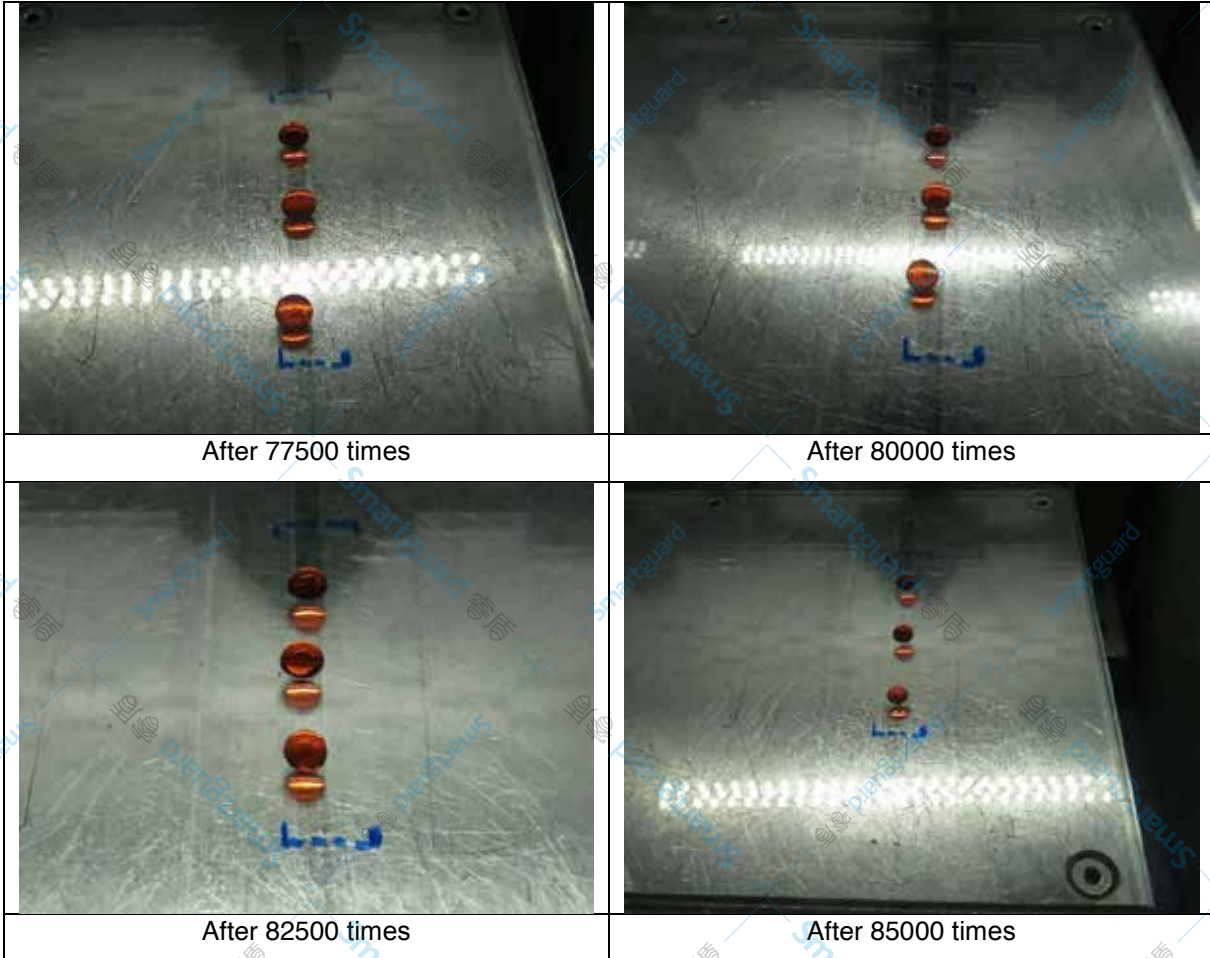
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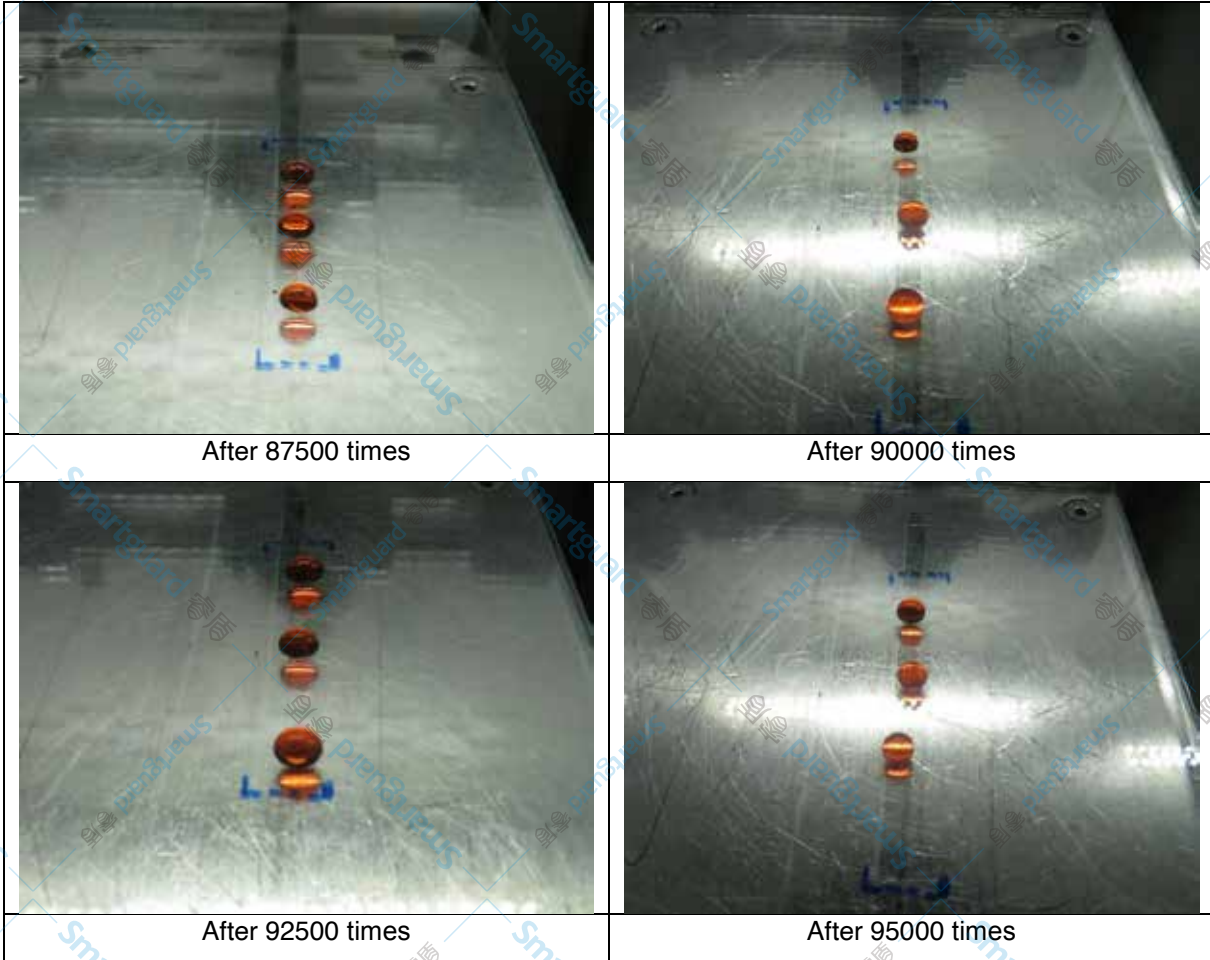
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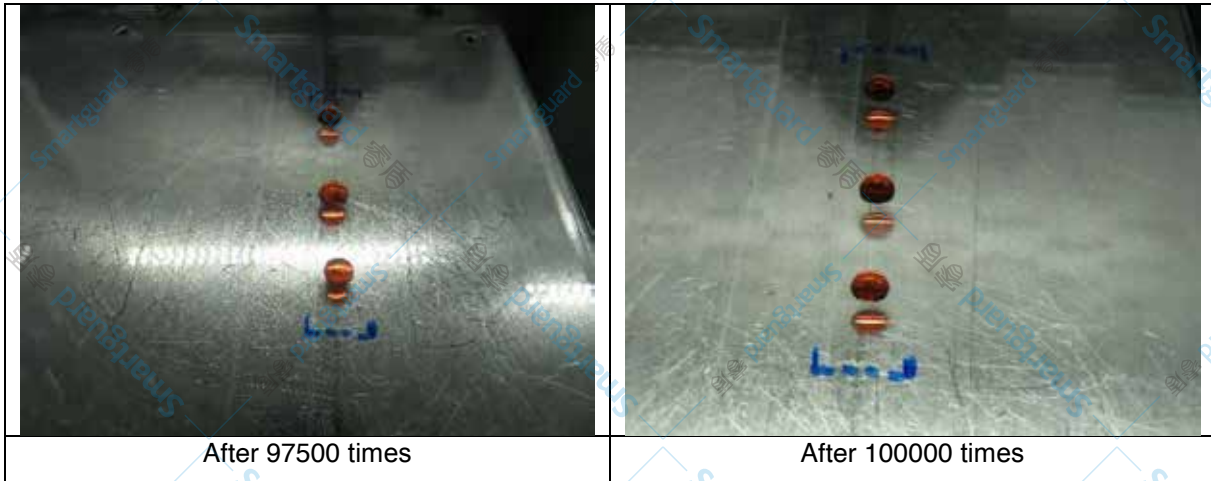
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Equipment Information:

Equipment	Model	Equipment No.	Calibration date	Next Calibration date
Electrodynamic Crocking Tester	TG-5223-A	GZMR-AG-E126	2020-09-15	2021-09-14



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2. Test Item: Detergent Resistance

Sample Description: Easy-to-clean coated glass

Test Method: AAMA 2605-20 Section 8.7.4

Test Condition:

Temperature: 38°C

Time of contact: 72h

Tape: Elcometer 99

Test Result:

Test Item	Test Result	Requirement in AAMA 2605-20	Conclusion
Detergent Resistance	No loss of adhesion, no blistering or other visible change	No loss of adhesion of the film to the metal, no blistering and no significant visual change in appearance.	Pass

Note: The solid detergent composition is as follows:

Tetrasodium pyrophosphate (AR): 53% (m/m)

Sodium sulphate anhydrous (AR): 19% (m/m)

Sodium linear alkylarylsulfonate (AR): 20% (m/m)

Sodium metasilicate hydrated (AR): 7% (m/m)

Sodium carbonate anhydrous (AR): 1% (m/m)

Prepare a 30g/L solution of detergent with the solid detergent.



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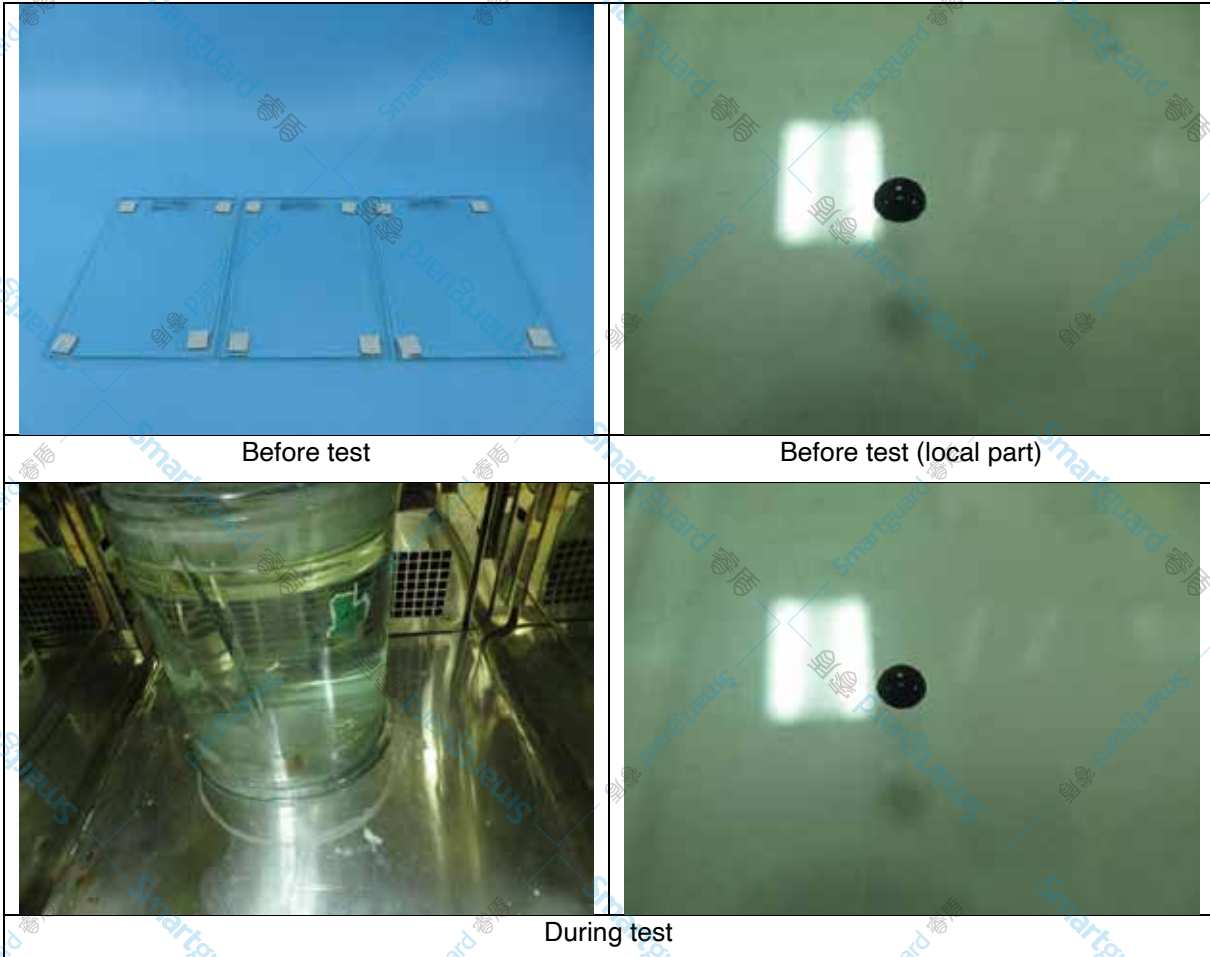
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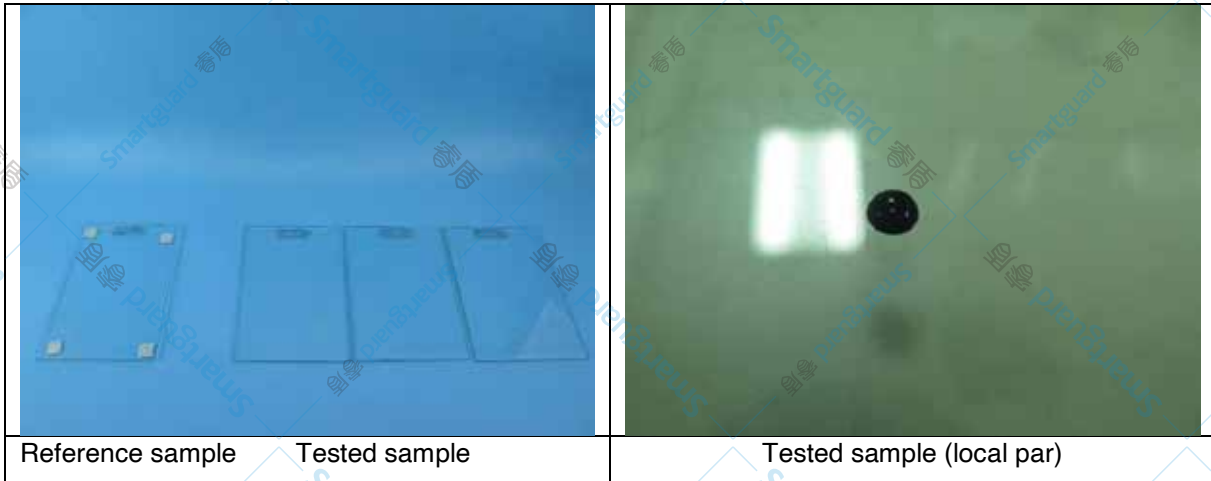
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### Equipment Information:

Equipment	Model	Equipment No.	Calibration date	Next Calibration date
Electron balance	JJ2000B	GZMR-AG-E213	2020-04-27	2021-04-26
High temperature oven with air circulation	MS-GW- 150B	GZMR-PL-E151	2020-09-14	2021-09-13



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### 3. Test Item: Muriatic Acid Resistance

Sample Description: Easy-to-clean coated glass

Test Method: AAMA 2605-20 Section 8.7.1

Test Condition:

Medium: 10%(V/V) HCl

Method of contact: Spot method

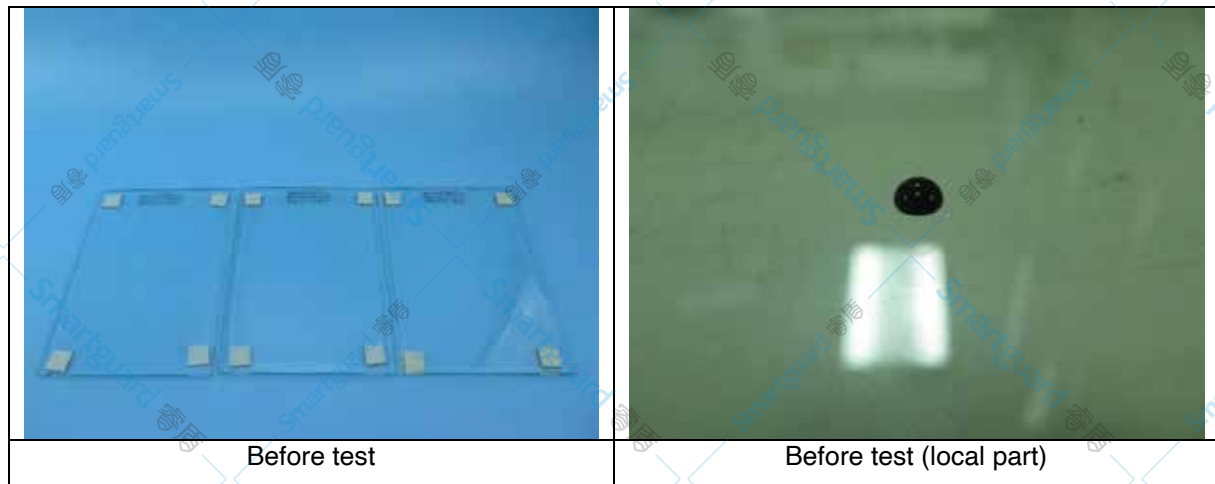
Temperature: Room temperature

Time of contact: 15min

Test Result:

Test Item	Test Result	Requirement in AAMA 2605-20	Conclusion
Muriatic Acid Resistance	No visual change	No blistering or other visual change	Pass

Test Photo:



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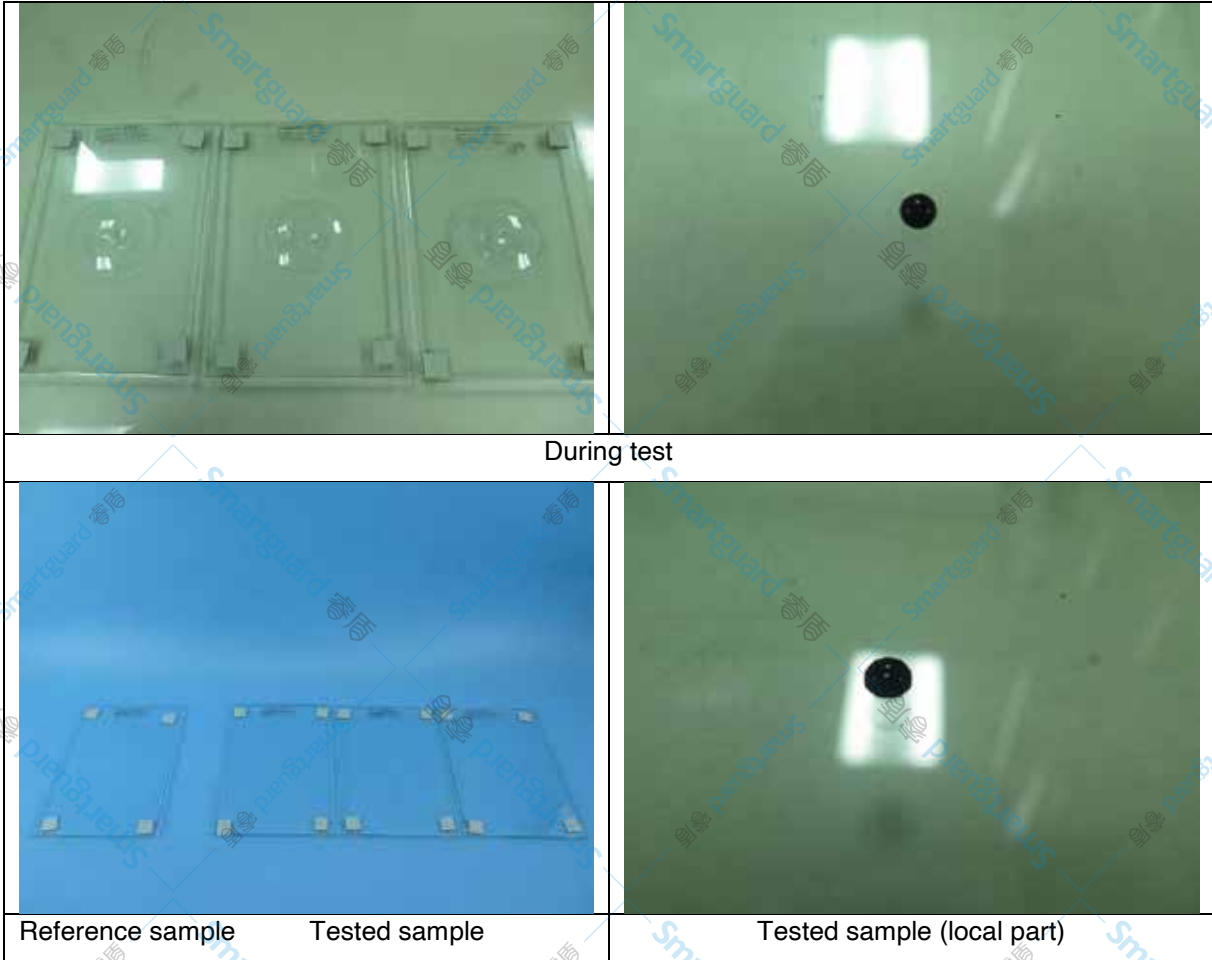


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4. Test Item: Window Cleaner Resistance

Sample Description: Easy-to-clean coated glass

Test Method: AAMA 2605-20 Section 8.7.5 & ASTM D3359-17

Test Condition:

Medium: Window Cleaner ( See note )

Method of contact: Spot method

Temperature: Room temperature

Time of contact: 24h

Cut space: 1mm

Tape: Elcometer 99

Test period: 2021-01-29~2021-02-04

Test Result:

Test Item	Test Result	Requirement in AAMA 2605-20	Conclusion
Window Cleaner Resistance	No blistering or other visible change, no removal of film	No blistering or noticeable change in appearance, no removal of film under the tape within or outside of the cross-hatched area.	Pass

Note: The glass cleaner composition is as follows:

Propylene glycol methyl ether (AR): 5% (m/m)

Propylene glycol (AR): 5% (m/m)

Isopropanol(AR): 35% (m/m)

Water: 55%(m/m)



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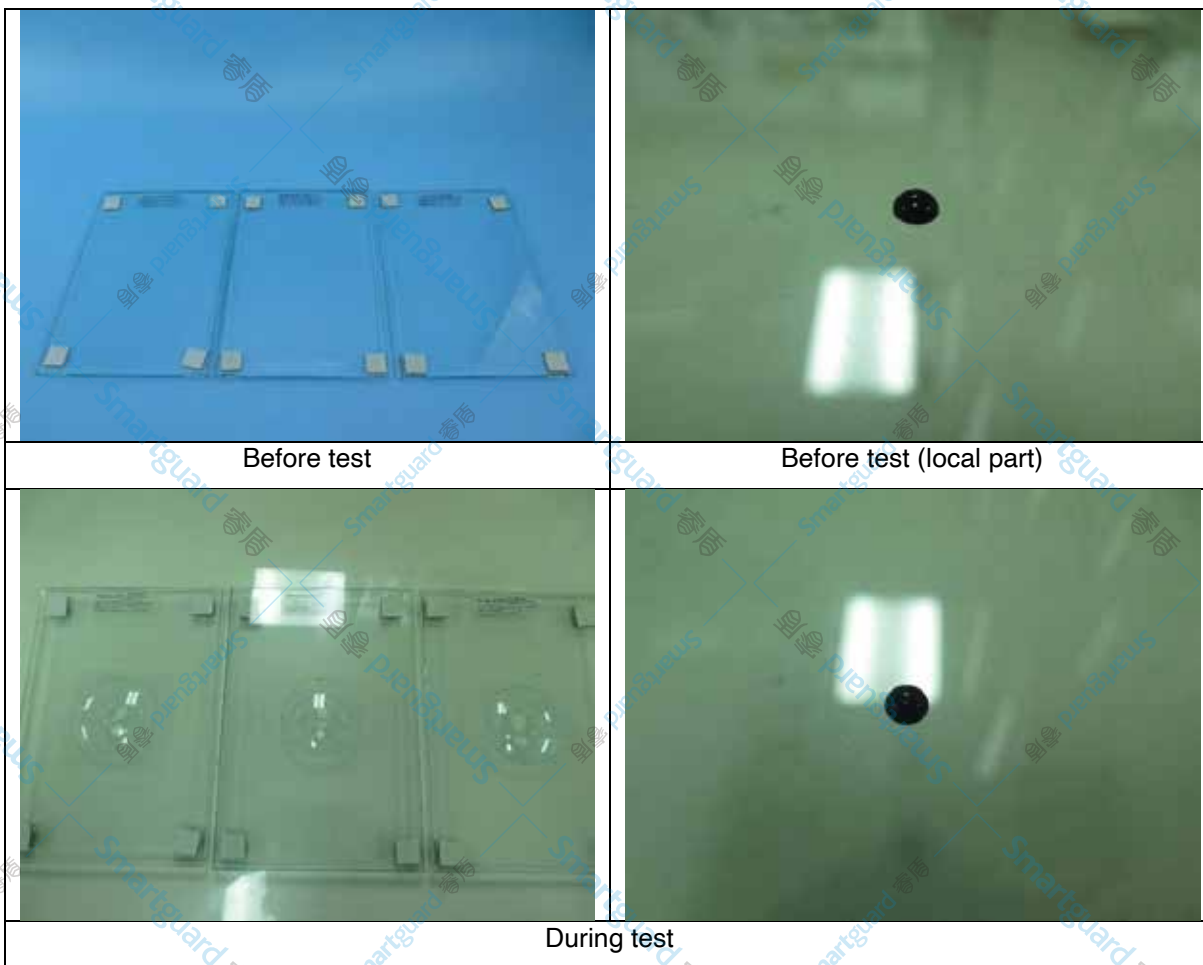
## TEST REPORT

No. : GZIN2101006053MR

Date : Mar 15, 2021

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Test Photo:



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# Test Report

No. SZXEC2100252601

Date: 01 Feb 2021

Page 1 of 6

SHENZHEN SMARTGUARD NANO MATERIAL CO., LTD.

RM.9B,JIALITAI BUILDING,YANSHAN ROAD,NANSHAN DIST.,SHENZHEN,CHINA.

The following sample(s) was/were submitted and identified on behalf of the clients as : Smartguard Easy-to-clean Nano Coating

SGS Job No. : RP21-001839 - SZ

Date of Sample Received : 26 Jan 2021

Testing Period : 26 Jan 2021 - 01 Feb 2021

Test Requested : Selected test(s) as requested by client.

Test Method : Please refer to next page(s).

Test Results : Please refer to next page(s).

Conclusion : Based on the performed tests on submitted sample(s), the results of Lead, Mercury, Cadmium, Hexavalent chromium, Polybrominated biphenyls (PBBs), Polybrominated diphenyl ethers (PBDEs) and Phthalates such as Bis(2-ethylhexyl) phthalate (DEHP) , Butyl benzyl phthalate (BBP), Dibutyl phthalate (DBP) , and Diisobutyl phthalate (DIBP) comply with the limits as set by RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU.

Signed for and on behalf of  
SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

Andy Ni  
Approved Signatory



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# Test Report

No. SZXEC2100252601

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Test Results :

## Test Part Description :

Specimen No.	SGS Sample ID	Description
SN1	SZX21-002526.001	Colorless transparent liquid

Remarks :

- (1) 1 mg/kg = 1 ppm = 0.0001%
- (2) MDL = Method Detection Limit
- (3) ND = Not Detected ( < MDL )
- (4) "-" = Not Regulated

## RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU

Test Method : With reference to IEC 62321-4:2013+AMD1:2017, IEC62321-5:2013, IEC62321-7-2:2017, IEC 62321-6:2015 and IEC62321-8:2017, analyzed by ICP-OES, UV-Vis and GC-MS.

Test Item(s)	Limit	Unit	MDL	001
Cadmium (Cd)	100	mg/kg	2	ND
Lead (Pb)	1,000	mg/kg	2	ND
Mercury (Hg)	1,000	mg/kg	2	ND
Hexavalent Chromium (Cr(VI))	1,000	mg/kg	8	ND
Sum of PBBs	1,000	mg/kg	-	ND
Monobromobiphenyl	-	mg/kg	5	ND
Dibromobiphenyl	-	mg/kg	5	ND
Tribromobiphenyl	-	mg/kg	5	ND
Tetrabromobiphenyl	-	mg/kg	5	ND
Pentabromobiphenyl	-	mg/kg	5	ND
Hexabromobiphenyl	-	mg/kg	5	ND
Heptabromobiphenyl	-	mg/kg	5	ND
Octabromobiphenyl	-	mg/kg	5	ND
Nonabromobiphenyl	-	mg/kg	5	ND
Decabromobiphenyl	-	mg/kg	5	ND
Sum of PBDEs	1,000	mg/kg	-	ND
Monobromodiphenyl ether	-	mg/kg	5	ND
Dibromodiphenyl ether	-	mg/kg	5	ND
Tribromodiphenyl ether	-	mg/kg	5	ND
Tetrabromodiphenyl ether	-	mg/kg	5	ND
Pentabromodiphenyl ether	-	mg/kg	5	ND



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# Test Report

No. SZXEC2100252601

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Test Item(s)	Limit	Unit	MDL	001
Hexabromodiphenyl ether	-	mg/kg	5	ND
Heptabromodiphenyl ether	-	mg/kg	5	ND
Octabromodiphenyl ether	-	mg/kg	5	ND
Nonabromodiphenyl ether	-	mg/kg	5	ND
Decabromodiphenyl ether	-	mg/kg	5	ND
Dibutyl Phthalate (DBP)	1,000	mg/kg	50	ND
Butyl benzyl Phthalate (BBP)	1,000	mg/kg	50	ND
Bis(2-ethylhexyl) Phthalate (DEHP)	1,000	mg/kg	50	ND
Diisobutyl Phthalate (DIBP)	1,000	mg/kg	50	ND

Notes :

- (1) The maximum permissible limit is quoted from RoHS Directive (EU) 2015/863.
- (2) IEC 62321 series is equivalent to EN 62321 series  
[https://www.cenelec.eu/dyn/www/f?p=104:30:1742232870351101:::FSP\\_ORG\\_ID,FSP\\_LANG\\_ID:1258637,25](https://www.cenelec.eu/dyn/www/f?p=104:30:1742232870351101:::FSP_ORG_ID,FSP_LANG_ID:1258637,25)
- (3) The restriction of DEHP, BBP, DBP and DIBP shall apply to medical devices, including in vitro medical devices, and monitoring and control instruments, including industrial monitoring and control instruments, from 22 July 2021.

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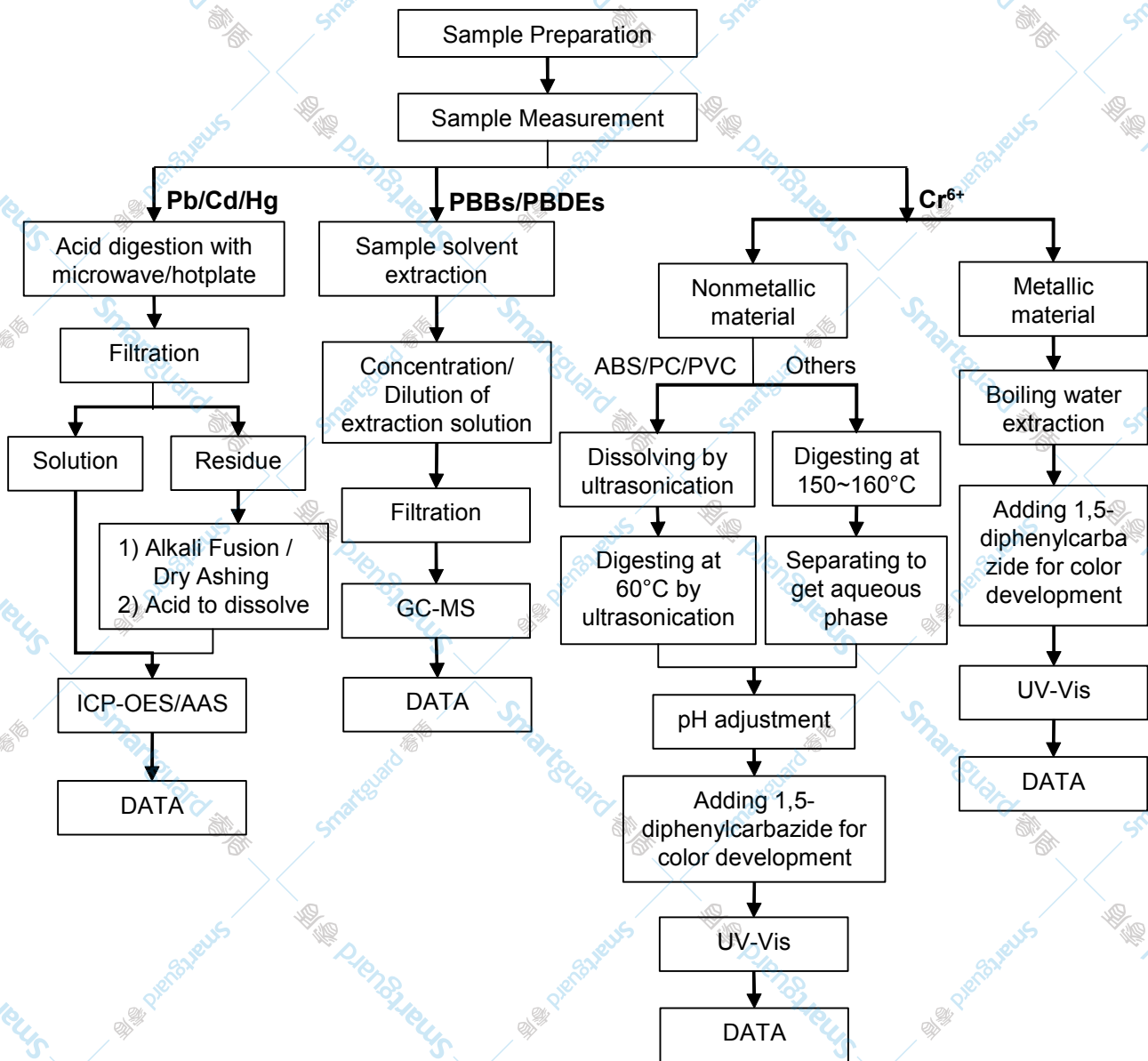
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Pb/Cd/Hg/Cr<sup>6+</sup>/PBBs/PBDEs Testing Flow Chart

1) These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr<sup>6+</sup> and PBBs/PBDEs test method excluded).



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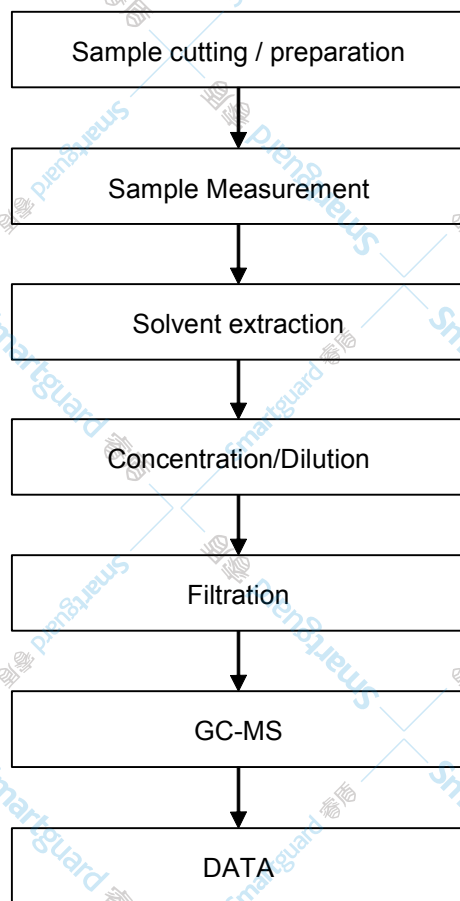
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Phthalates Testing Flow Chart



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**Test Report**

No. SZXEC2100252601

Date: 01 Feb 2021

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Sample photo:



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# Test Report

No. SZXEC2100252603

Date: 01 Feb 2021

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SHENZHEN SMARTGUARD NANO MATERIAL CO., LTD.  
RM.9B,JIALITAI BUILDING,YANSHAN ROAD,NANSHAN DIST.,SHENZHEN,CHINA.

The following sample(s) was/were submitted and identified on behalf of the clients as : Smartguard Easy-to-clean Nano Coating

SGS Job No. :	RP21-001839 - SZ
Date of Sample Received :	26 Jan 2021
Testing Period :	26 Jan 2021 - 01 Feb 2021
Test Requested :	Selected test(s) as requested by client.
Test Method :	Please refer to next page(s).
Test Results :	Please refer to next page(s).

Signed for and on behalf of  
SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

Andy Ni  
Approved Signatory



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# Test Report

No. SZXEC2100252603

Date: 01 Feb 2021

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Test Results :

Test Part Description :

Specimen No.	SGS Sample ID	Description
SN1	SZX21-002526.001	Colorless transparent liquid

Remarks :

- (1) 1 mg/kg = 1 ppm = 0.0001%
- (2) MDL = Method Detection Limit
- (3) ND = Not Detected ( < MDL )
- (4) "-" = Not Regulated

### Perfluorooctanoic acid (PFOA) and its salts & Perfluorooctane sulfonates (PFOS) and its derivatives

Test Method : With reference to CEN/TS15968:2010, analysis was performed by LC-MS or LC-MS/MS.

Test Item(s)	CAS NO.	Unit	MDL	001
Perfluorooctanoic acid (PFOA) and its salts+	-	mg/kg	0.010	ND
Perfluorooctane sulfonates (PFOS)^	1763-23-1	mg/kg	0.010	ND
Perfluorooctane sulfonamide (PFOSA)	754-91-6	mg/kg	0.010	ND
N-methylperfluoro-1-octanesulfonamide (MeFOSA)	31506-32-8	mg/kg	0.010	ND
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	mg/kg	0.010	ND
2-(N-methylperfluoro-1-octanesulfonamido) -ethanol (MeFOSE)	24448-09-7	mg/kg	0.010	ND
2-(N-ethylperfluoro-1-octanesulfonamido) -ethanol (EtFOSE)	1691-99-2	mg/kg	0.010	ND
Perfluorooctane sulfonates (PFOS) and its derivatives	-	mg/kg	0.010	ND

Notes :

- (1)+ PFOA refer to its salts including PFOA-Na (CAS No.: 335-95-5), PFOA-K (CAS No.: 2395-00-8), PFOA-Ag (CAS No.: 335-93-3), PFOA-F (CAS No.: 335-66-0) and APFO (CAS No.: 3825-26-1).
- (2)^ PFOS refer to its derivatives including PFOS-K (CAS No.: 2795-39-3), PFOS-Li (CAS No.: 29457-72-5), PFOS-NH4 (CAS No.: 29081-56-9), PFOS-NH(OH)2 (CAS No.: 70225-14-8), PFOS-N(C2H5)4 (CAS No.: 56773-42-3), PFOS-DDA(CAS No.:251099-16-8) and POSF (CAS No.: 307-35-7)



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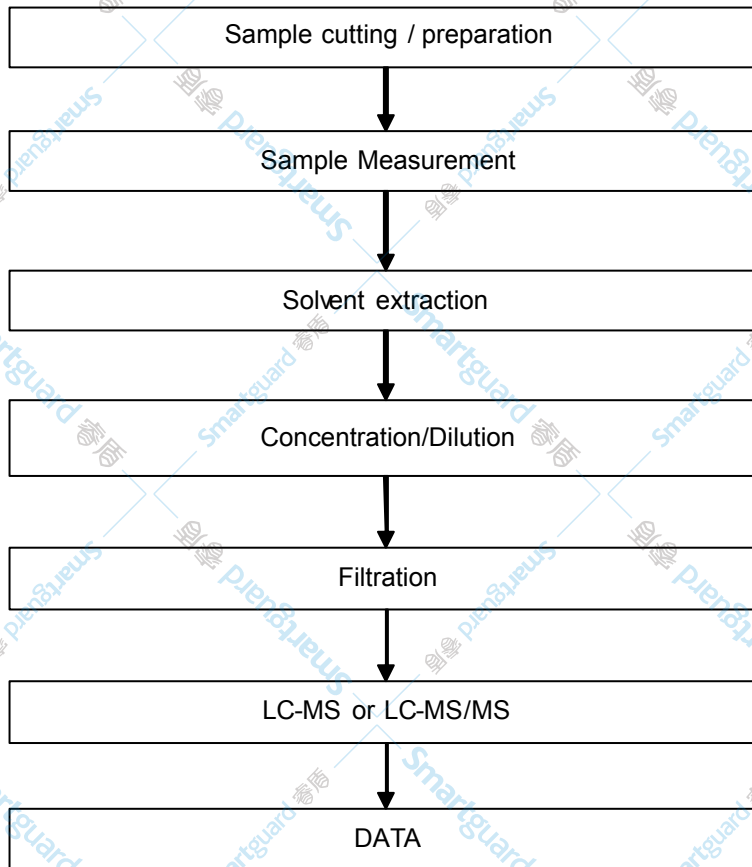
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PFOA / PFOS Testing Flow Chart



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## Test Report

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编号 Reference number: 20190923-0011

# 测试报告

## Test Report

受检单位: 深圳市睿盾纳米新材料有限公司

样品名称: 易洁玻璃涂层

型号规格: Smartguard 易洁涂层系列

测试类别: 委托测试

Applicant: Shenzhen Smartguard Nano Material Co., Ltd.

Product: Easy-to-clean Glass Coating

Specification: Smartguard Easy-to-clean Coating Series

Test category: Commission inspection



测试人  
Prepared by

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校核人  
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批准人  
Approved by

沈涛

报告批准日期  
Report approval date

浙江大学材料学院  
测试服务业务专用章

浙江大学材料科学与工程学院

表面与结构改性无机功能材料教育部工程研究中心

School of Materials Science and Engineering, Zhejiang University.  
The Engineering Center of Surface and Structure Modified Inorganic  
Functional Materials of Ministry of Education.

# 测试报告

# Test Report

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School of Materials Science and Engineering, Zhejiang University.  
The Engineering Center of Surface and Structure Modified Inorganic  
Functional Materials of Ministry of Education.

编号 Reference number: 20190923-0011

日期 Date: 2019 / 09 / 29

产品名称 Product name	易洁玻璃涂层 Easy-to-clean Coating	型号 Specification	Smartguard 易洁涂层系列 Easy-to-clean Coating Series
受检单位 Applicant	深圳市睿盾纳米新材料有限公司 Shenzhen Smartguard Nano Material Co., Ltd.		
样品数量 Number of samples	30Pcs	委托样品收到日期 Sample receipt date	2019/ 9/23
样品状态 Sample status	完好 Intact		
测试项目 Test items	<ol style="list-style-type: none"> <li>1. 接触角、滑动角;</li> <li>2. 耐磨性、耐老化、沸水测试;</li> <li>3. 透光率;</li> <li>4. 耐弱酸、耐弱碱、疏油性。</li> </ol> <ol style="list-style-type: none"> <li>1. Contact angle and sliding angle;</li> <li>2. Wear resistance, aging resistance, boiling water test;</li> <li>3. Light transmittance;</li> <li>4. Chemical resistance to weak acid, weak alkali and oleophobicity.</li> </ol>		
测试日期 Test Date	2019/09/23 - 2019/09/27		

注：测试结果只针对送测样品 Test results are only for the tested samples

受检单位 通讯资料 Applicant communication details	地址 Add	深圳市南山区蛇口沿山路佳利泰大厦9B室 Rm9A, Jialitai Building, Yanshan Road, Nanshan Dist., Shenzhen, China		
	邮编 Postcode	518000	电话 Tel	+86-0755-26890033
备注 Remarks	-			



# 测试报告

# Test Report

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编号 Reference number: 20190923-0011

日期 Date: 2019 / 09 / 29

测试项目 Test items	接触角、滑动角 Contact angle, Sliding angle
测试仪器/方法 Test instrument / method	接触角测量仪 (DCA20, DATAPHYSI) Contact angle tester (DCA20, DATAPHYSI)
测试结果 Test result	接触角: 108.0° (第一次测结果: 108.3°, 第二次测结果: 107.5°, 第三次测结果: 108.2° 。) 滑动角: 11.0° (第一次测结果: 11.3°, 第二次测结果: 11.1° 第三次测结果: 10.6° 。)  Contact angle: 108.0° (First test result: 108.3°, Second test result: 107.5°, Third test result: 108.2° 。) Sliding angle: 11.0° (First test result: 11.3°, Second test result: 11.1°, Third test result: 10.6° 。)
测试日期 Test Date	2019/09/23 - 2019/09/27

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备注 Remarks	-			

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测试项目 Test items	耐磨性、耐老化、沸水测试 Wear resistance, Aging resistance, Boiling water test
测试仪器/方法 Test instrument / method	负载125g摩擦块, 尺寸90mm*40mm, 来回摩擦60000次; UVA-340紫外线老化实验箱内100小时; 沸水煮1小时。 接触角测量仪 (DCA20, DATAPHYSI)  Applied 125gs force to the scrubbing pad, test block of size 90mmx40mm, performing 60,000 cycles of forward and back motion; UVA-340 UV 100 hours in the aging test chamber; boiling water for 1 hour. Contact angle tester (DCA20, DATAPHYSI)
测试结果 Test result	摩擦后接触角: 105.0° (第一次测结果: 104.8°, 第二次测结果: 104.5°, 第三次测结果: 105.7° 。) UV老化后接触角: 102.6° (第一次测结果: 102.4°, 第二次测结果: 102.3°, 第三次测结果: 103.1° 。) 水煮后接触角: 106.8° (第一次测结果: 106.6°, 第二次测结果: 106.8°, 第三次测结果: 107.0° 。)  After wear contact angle: 105.0° (First test result: 104.8°, Second test result: 104.5°, Third test result: 105.7° 。) After UV contact angle: 102.6° (First test result: 102.4°, Second test result: 102.3°, Third test result: 103.1° 。) After boiling contact angle: 106.8° (First test result: 106.6°, Second test result: 106.8°, Third test result: 107.0° 。)
测试日期 Test Date	2019/09/23 - 2019/09/27

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测试项目 Test items	透光率 Light transmittance
测试仪器/方法 Test instrument / method	紫外分光光度计 (Cary 5000, Agilent) UV-Vis-NIR spectrophotometer (Cary 5000, Agilent)
测试结果 Test result	可见光平均透过率: 91.0 % (第一次测结果: 91.2%, 第二次测结果: 90.5%, 第三次测结果: 91.3%。)  Average transmittance in UV-Vis: 91.0% (First test result: 91.2%, Second test result: 90.5%, Third test result: 91.3%.)
测试日期 Test Date	2019/09/23 - 2019/09/27

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测试项目 Test items	耐弱酸、耐弱碱、疏油性 Weak acid resistance, Weak alkali resistance, Oleophobicity
测试仪器/方法 Test instrument / method	50%的浓盐酸水溶液; 碱性清洗剂; 正十二烷 (疏油测试)。 接触角测量仪 (DCA20, DATAPHYSI)  50% of hydrochloric acid aqueous solution; Alkaline cleaning agent ; N-dodecane (oleophobic test). Contact angle tester (DCA20, DATAPHYSI)
测试结果 Test result	耐酸一小时后: 106.2° (第一次测结果: 106.1° , 第二次测结果: 106.3° , 第三次测结果: 106.2° 。) 耐碱一小时后: 106.9° (第一次测结果: 106.7° , 第二次测结果: 106.9° , 第三次测结果: 107.1° 。) 疏油角度: 82.0° (第一次测结果: 82.3° , 第二次测结果: 81.8° , 第三次测结果: 81.9° 。)  After one hour of acid bath: 106.2° (First test result: 106.1° , Second test result: 106.3° , Third test result: 106.2° 。) After one hour of alkali bath: 106.9° (First test result: 106.7° , Second test result: 106.9° , Third test result: 107.1° 。) Oleophobic angle: 82.0° (First test result: 82.3° , Second test result: 81.8° , Third test result: 81.9° 。)
测试日期 Test Date	2019/09/23 - 2019/09/27

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