




# TEST REPORT

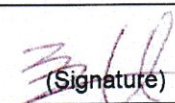
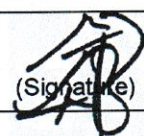
 <b>CTK Co., Ltd.</b> <small>The First Team of Total Inspection Contribution</small>	<b>CTK Co., Ltd.</b> (Ho-dong) 113, Yejik-ro, Cheoin-gu, Yongin-shi Gyeonggi-do KOREA, REPUBLIC OF Tel: +82-31-339-9970 Fax: +82-31-624-9501	REPORT No.: CTK-K-2019-00727 Page (1) / (17) pages	 KOLAS TESTING NO. KT119
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1. **Applicant**
  - Name.....: SHINWOO TECH Co.,Ltd
  - Address.....: 51, Seochon-ro, Bupyeong-gu, Incheon, Republic of Korea
  - Date of Receipt.....: 2019-10-01
2. **Manufacturer**
  - Name.....: SHINWOO TECH Co.,Ltd
  - Address.....: 51, Seochon-ro, Bupyeong-gu, Incheon, Republic of Korea
3. **Use of Report**.....: Quality control
4. **Test sample / Model**.....: SOH 250 / SOH 250
5. **Date(s) of test** .....: 2019-10-01 to 2019-10-04
6. **Test Standard (Method) used** ....: KS C IEC 60529:2006
7. **Testing Environment** .....: Temperature: (25.0 ± 10.0) °C, Humidity: (50 ± 25) %R.H.,  
Air Pressure: (96.0 ± 10.0) kPa
8. **Results** .....: Reference test results

The results shown in this test report refer only to the sample(s) tested unless otherwise stated.  
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Approval	Tested by: WonHyeon Choi  (Signature)	Technical Manager: YenHwang Jung  (Signature)
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The above testing certificate is the accredited test result by Korea Laboratory Accreditation Scheme (KOLAS), which signed the ILAC-MRA


2019-10-11

Accredited by KOLAS, Republic of KOREA **CTK Co., Ltd.**

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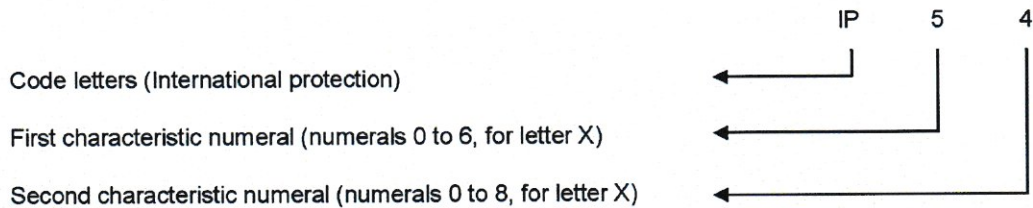
G4B(www.g4b.go.kr)진위확인코드 : ZGpN4XQUXHA=



## 1. Degrees of protection provided by enclosures (IP code)

### 1.1 Test standard: KS C IEC 60529:2006

### 1.2 Arrangement of the IP code



#### 1.2.1 Degree of protection against access to hazardous parts indicated by the first characteristic numeral

First characteristic numeral	Degree of protection	Application
0	Non-protected	<input type="checkbox"/>
1	Protected against access to hazardous parts with the back of a hand. The access probe, sphere of 50 mmØ, shall have adequate clearance from hazardous parts. Test force: 50 N ± 10 %	<input type="checkbox"/>
2	Protected against access to hazardous parts with a finger. The jointed test finger of 12 mmØ, 80 mm length, shall have adequate clearance from hazardous parts. Test force: 10 N ± 10 %	<input type="checkbox"/>
3	Protected against access to hazardous parts with a tool. The access probe of 2.5 mmØ, shall not penetrate. Test force: 3 N ± 10 %	<input type="checkbox"/>
4	Protected against access to hazardous parts with a wire. The access probe of 1.0 mmØ, shall not penetrate. Test force: 1 N ± 10 %	<input type="checkbox"/>
5	Protected against access to hazardous parts with a wire. The access probe of 1.0 mmØ, shall not penetrate. Test force: 1 N ± 10 %	<input checked="" type="checkbox"/>



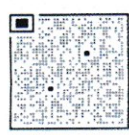


First characteristic numeral	Degree of protection	Application
6	Protected against access to hazardous parts with a wire. The access probe of 1.0 mmØ, shall not penetrate. Test force: 1 N ± 10 %	<input type="checkbox"/>

**NOTE** In the case of the first characteristic numerals 3, 4, 5 and 6, protection against access to hazardous parts is satisfied if adequate clearance is kept. The adequate clearance should be specified by the relevant product committee in accordance with 12.3. Due to the simultaneous requirement specified in table 2, the definition "shall not penetrate" is given in table 1.

**1.2.2 Degree of protection against solid foreign objects indicated by the first characteristic numeral**

First characteristic numeral	Degree of protection	Application
0	Non-protected	<input type="checkbox"/>
1	Protected against solid foreign objects of 50 mmØ and greater. The object probe, sphere of 50 mmØ, shall not fully penetrate <sup>1)</sup> . Test force: 50 N ± 10 %	<input type="checkbox"/>
2	Protected against solid foreign objects of 12.5 mmØ and greater. The object probe, sphere of 12.5 mmØ, shall not fully penetrate <sup>1)</sup> . Test force: 30 N ± 10 %	<input type="checkbox"/>
3	Protected against solid foreign objects of 2.5 mmØ and greater. The object probe, sphere of 2.5 mmØ, shall not penetrate at all <sup>1)</sup> . Test force: 3 N ± 10 %	<input type="checkbox"/>
4	Protected against solid foreign objects of 1.0 mmØ and greater. The object probe, sphere of 1.0 mmØ, shall not penetrate at all <sup>1)</sup> . Test force: 1 N ± 10 %	<input type="checkbox"/>
5	<b>Dust Testing Equipment</b> Whether reductions in pressure below the atmospheric pressure are present or not, ingress of dust is not totally preventive, but dust shall not penetrate in a quantity to interfere with satisfactory operation of the apparatus or to impair safety. (Talcum powder have to go through the measured sieve by Φ 50 um wire that are spacing 75 um in squared, per volume and union Talcum powder have to be 2 kg/m <sup>3</sup> )	—





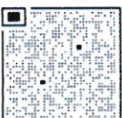


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First characteristic numeral	Degree of protection	Application
	<p><b>Category 1:</b> Enclosures where the normal working cycle of the equipment causes reductions in air pressure within the enclosure below that of the surrounding air, for example, due to thermal cycling effects.</p> <p>Products in volume ..... : <b>23 755.68 cm<sup>3</sup> → 23.76 L</b></p> <p>Target intake volume (Products in volume 80) : <b>1 900.46 L</b></p> <p>Suction volume (Max product in volume 60) . : <b>1 425.35 LPH → 23.76 LPM</b></p> <p>Actual Suction volume ..... : <b>23.75 L</b></p> <p>Suction pressure (Up to 2 kPa) ..... : <b>2 kPa</b></p> <p>Test time (Up to 8 time) ..... : <b>8 h</b></p>	<input checked="" type="checkbox"/>
	<p><b>Category 2:</b> Enclosures where no pressure difference relative to the surrounding air is present.</p>	<input type="checkbox"/>
6	<p>In Dust Testing Equipment, the test sample has to have no ingress of dust after testing atmospheric pressure present condition for 8 hr.</p> <p>(Talcum powder have to go through the measured sieve by <math>\Phi</math> 50 <math>\mu</math>m wire that are spacing 75 <math>\mu</math>m in squared, per volume and union Talcum powder have to be 2 kg/m<sup>3</sup>)</p> <p>Products in volume ..... : <b>cm<sup>3</sup> → L</b></p> <p>Target intake volume (Products in volume 80) : <b>L</b></p> <p>Suction volume (Max product in volume 60) . : <b>LPH → LPM</b></p> <p>Actual Suction volume ..... : <b>L</b></p> <p>Suction pressure (Up to 2 kPa) ..... : <b>kPa</b></p> <p>Test time (Up to 8 time) ..... : <b>h</b></p>	<input type="checkbox"/>
<p><sup>1)</sup> The full diameter of the object probe shall not pass through an opening of the enclosure.          Due to the simultaneous requirement specified in table 2, the definition "shall not penetrate" is given in table 1.</p>		





**1.2.3 Degrees of protection against water indicated by the second characteristic numeral**

Second characteristic numeral	Degrees of protection	Application
0	Non-protected	<input type="checkbox"/>
1	Water that drops vertically has to be harmless Drip box Fig.3, Enclosure on turntable Water flow rate: 1 mm/min Speed of Rotating platform: 1 r/min Eccentricity: Approximately 100 mm Duration of test: 10 min	<input type="checkbox"/>
2	When outskirts of the product have been tilted by 15° Water that drops vertically has to be harmless. Drip box Fig.3, Enclosure in 4 fixed positions of 15° tilt Water flow rate: 3 mm/min Duration of test: 2.5 min for each position of tilt	<input type="checkbox"/>
3	Vertical line of water that moves by ± 60° and its drops has to be harmless <input type="checkbox"/> Oscillating tube Fig.4, Spray ± 60° from vertical, Distance max. 200 mm Water flow rate: each of watering pit 0.07 l/min ± 5 % per hole Duration of test: 10 min <input type="checkbox"/> spray nozzle Fig. 5, Spray ± 60° from vertical Water flow rate: 10 l/min ± 5 % Duration of test: 1 min/m <sup>2</sup> at least 5 min: <b>min</b>	<input type="checkbox"/>
4	The product must not be harmed in any direction even splashing water. As for numeral 3, Spray ± 180° from vertical <input type="checkbox"/> Oscillating tube Fig.4, Spray ± 180° from vertical, Distance max. 200 mm Water flow rate: each of watering pit 0.07 l/min ± 5 % per hole Duration of test: 10 min <input checked="" type="checkbox"/> spray nozzle Fig. 5, Spray ± 180° from vertical Water flow rate: 10 l/min ± 5 % Duration of test: 1 min/m <sup>2</sup> at least 5 min: <b>5 min</b>	<input checked="" type="checkbox"/>





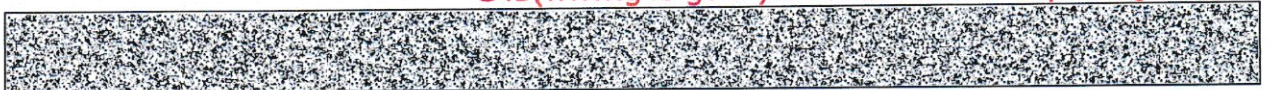




### 1.3 Test Result

IP code	Remark
IP 5X	No penetration of probe No ingress of dust
IP X4	No ingress of water.

※ The results shown in this test report refer only to the sample(s) tested unless otherwise stated







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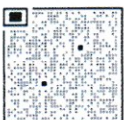


**List of test equipment used**

Instr. No.	Instrument type	Model	Make	Serial	Used
S3-T11	Sphere 50 mm diameter	IEC60529 IP1X	Kingpo	KP-TP001	<input type="checkbox"/>
S1-J10	Jointed test finger	TFP-01	ED&D	S1-J10	<input type="checkbox"/>
S1-J14	Test rod (2.5 mm)	TRP-01	ED&D	S1-J14	<input type="checkbox"/>
S1-J15	Test wire (1.0 mm)	TRP-02	ED&D	S1-J15	<input type="checkbox"/>
S1-X01	Push Pull Gage	FB30K	Imada	83805	<input checked="" type="checkbox"/>
S3-IP8	Dust Chamber	IEC60529 IP 5X6X	Kingpo	TX0010	<input checked="" type="checkbox"/>
S3-IP17	Big Dust Chamber	BR-TL-3F	Kingpo	S3-IP17	<input type="checkbox"/>
S3-IP22	Big Dust Chamber	NONE	Kingpo	S3-IP22	<input type="checkbox"/>
S3-IP1	Drip Box	IEC 60529 Drip Box, IPX1/ IPX2	Kingpo	-	<input type="checkbox"/>
S1-J19-1	ANGLE METER	AM-01	ED&D	CTK-IN-S1-154	<input type="checkbox"/>
S3-IP3	Oscillating Tube	IEC 60529 oscillating tube, with rotate table, IPX3/ IPX4	Kingpo	-	<input type="checkbox"/>
S3-IP4	Spray Nozzle	IEC 60529 Spray Nozzle, IPX3/ IPX4	Kingpo	-	<input checked="" type="checkbox"/>
S3-IP5	Hose Nozzle (6.3 mm)	IPX5	Kingpo	ZH13388	<input type="checkbox"/>
S3-IP6	Hose Nozzle (12.5 mm)	IPX6	Kingpo	ZH13388	<input type="checkbox"/>
S3-IP7	Immersion tank	Cage for IPX7	Kingpo	-	<input type="checkbox"/>
S3-IP26	Waterproof test apparatus	IPX3-6	Kingpo	0190309001	<input type="checkbox"/>
S1-SW2	Stop Watch	NONE	Casio	612Q1R-1	<input checked="" type="checkbox"/>
S1-H05	Aneroid Barometer	BAROMEX	SATO	84682	<input checked="" type="checkbox"/>
S5-H06	Hygro Thermograph	ST-50M	SEKONIC	HE51-000147	<input checked="" type="checkbox"/>

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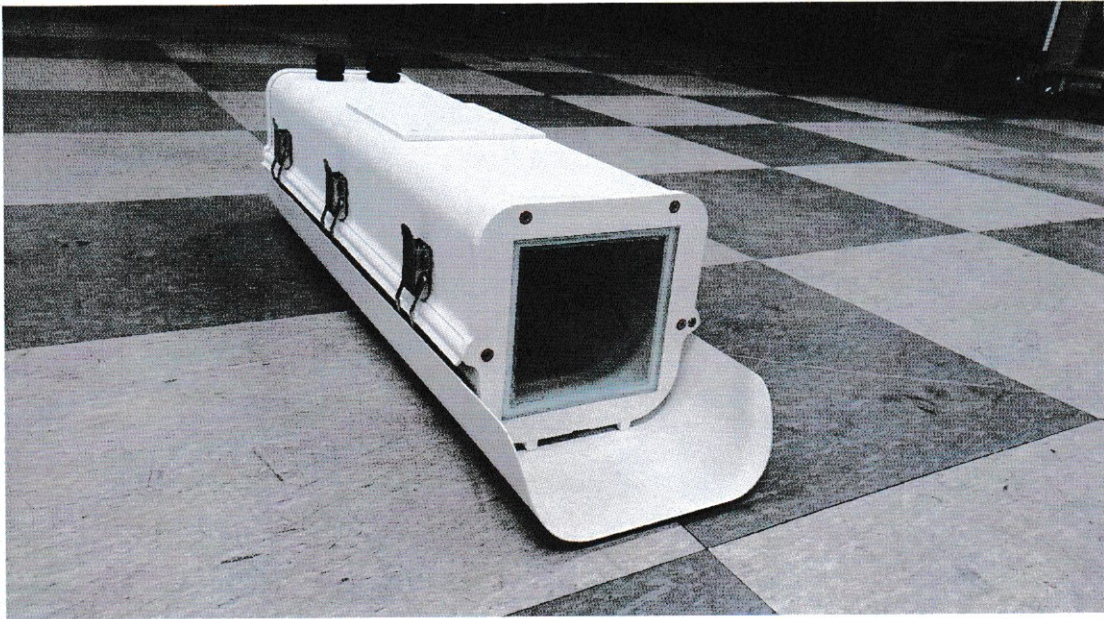




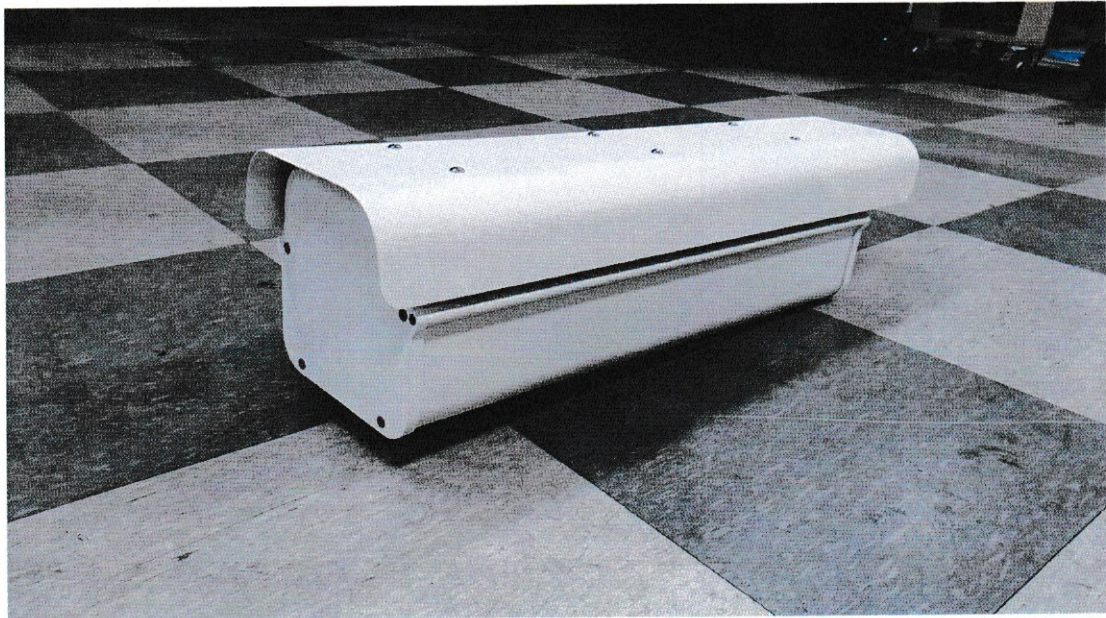
## 2. APPENDIX

### 2.1 Product Photographs

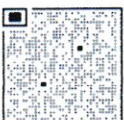
< Photo 1 > Product front view



< Photo 2 > Product back view



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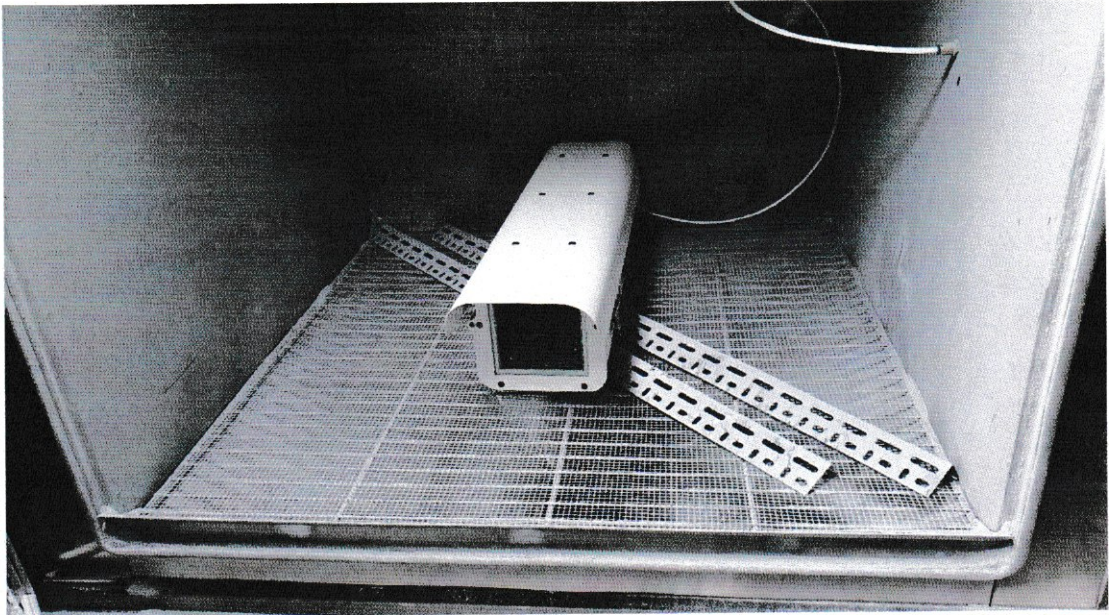
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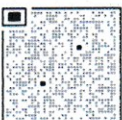
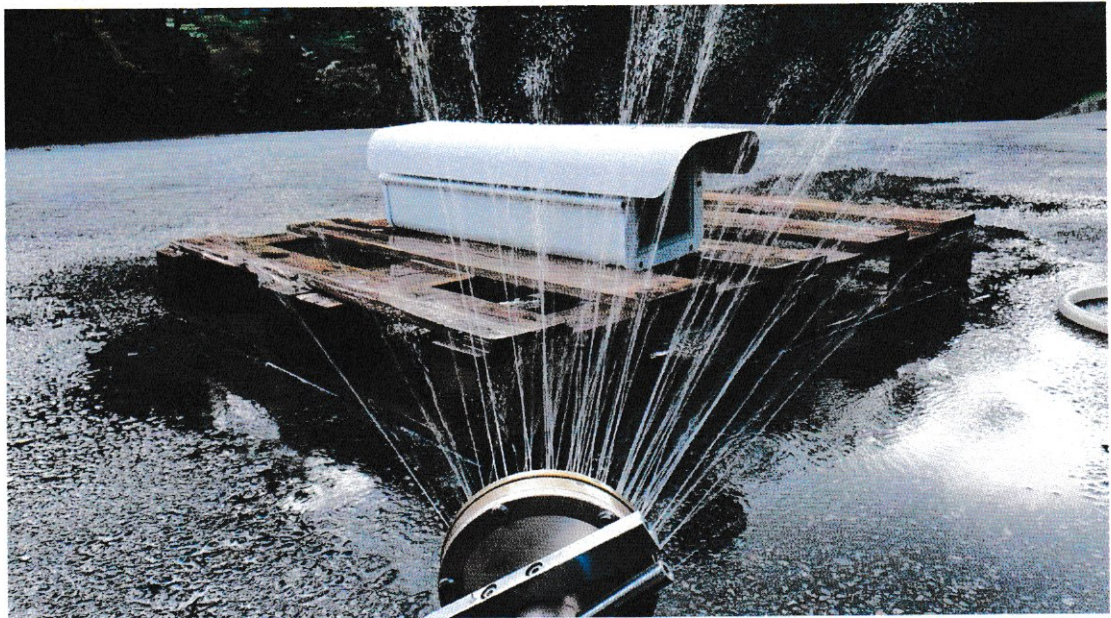


## 2.2 Test Setup Photos and Configuration

< Photo 3 > The first characteristic numeral test



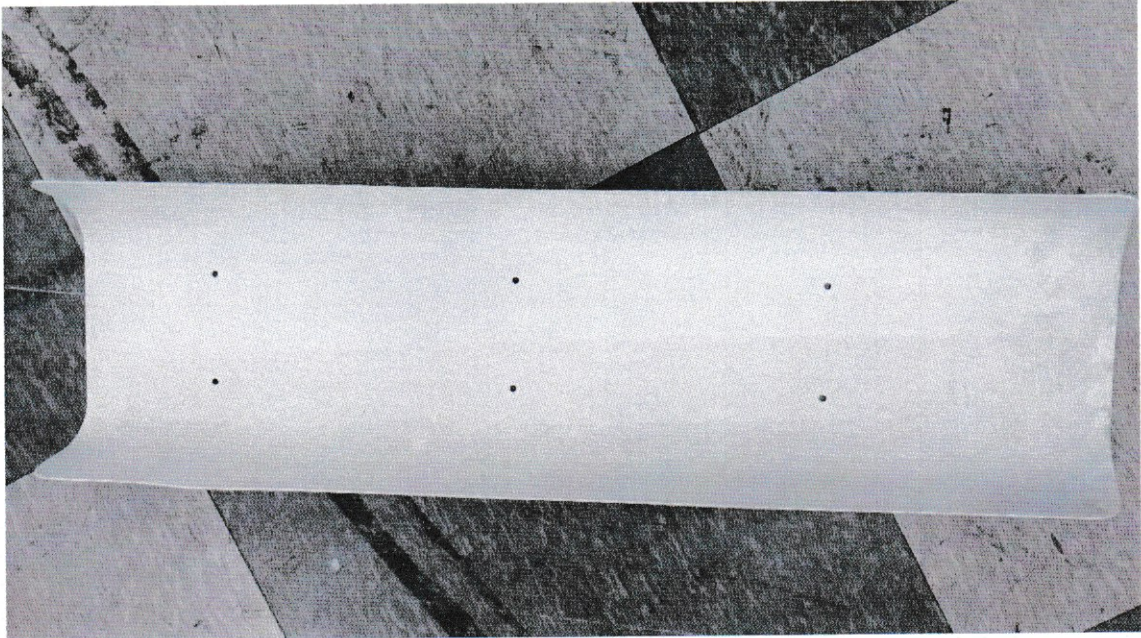
< Photo 4 > The second characteristic numeral test



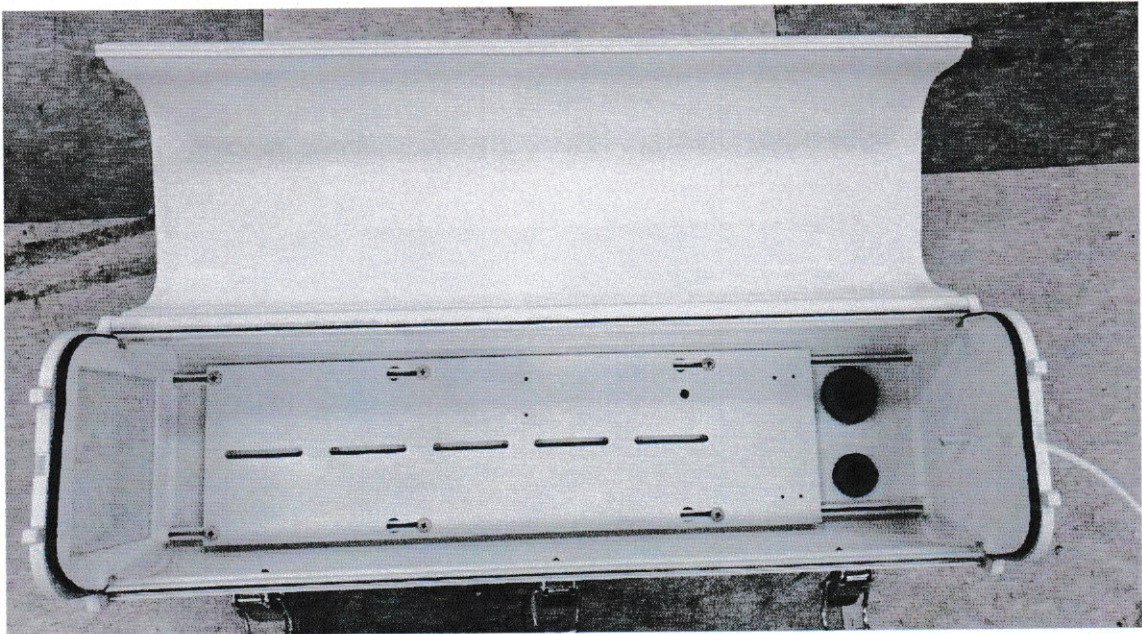


### 2.3 Product Internal photographs after test

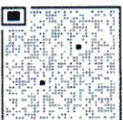
< Photo 5 > The first characteristic numeral test



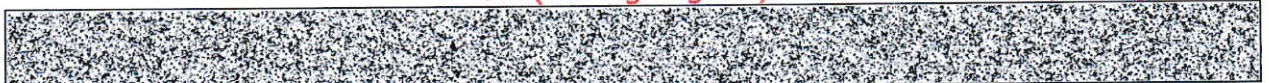
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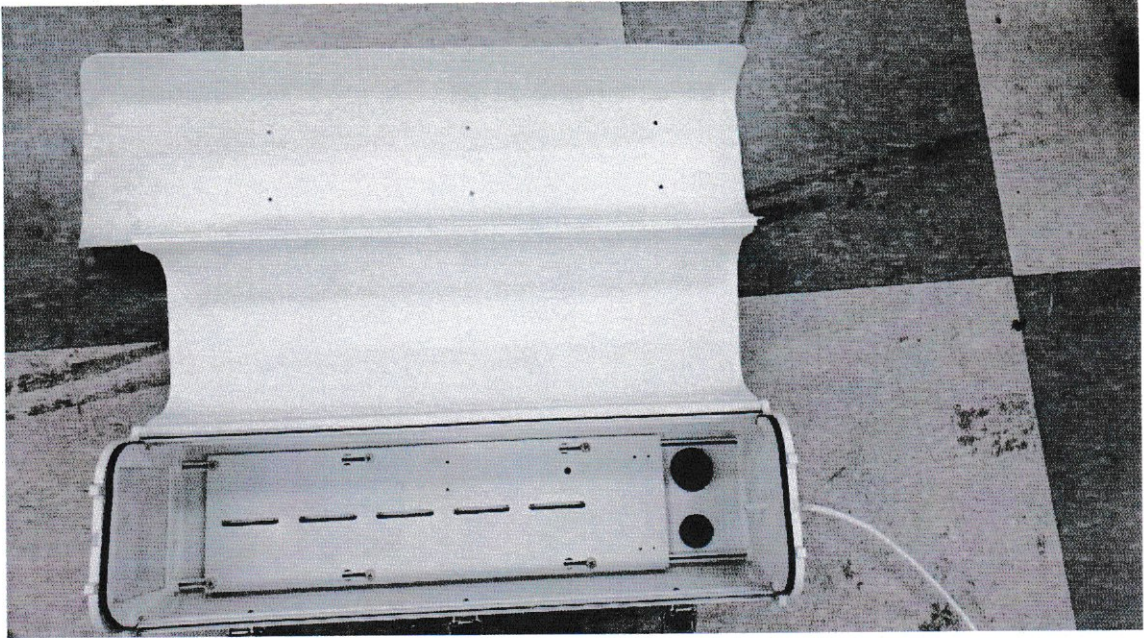


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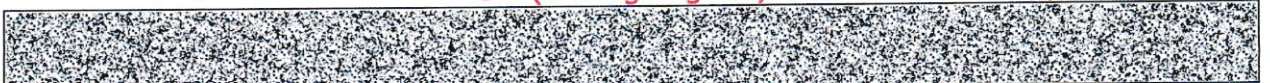
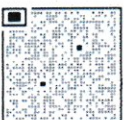


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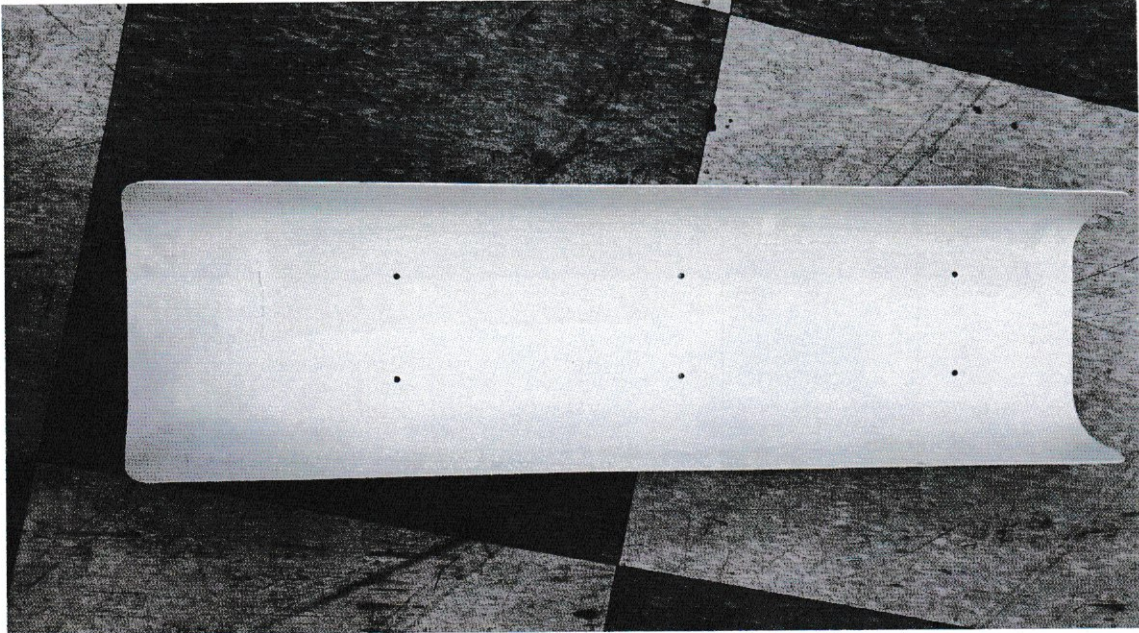


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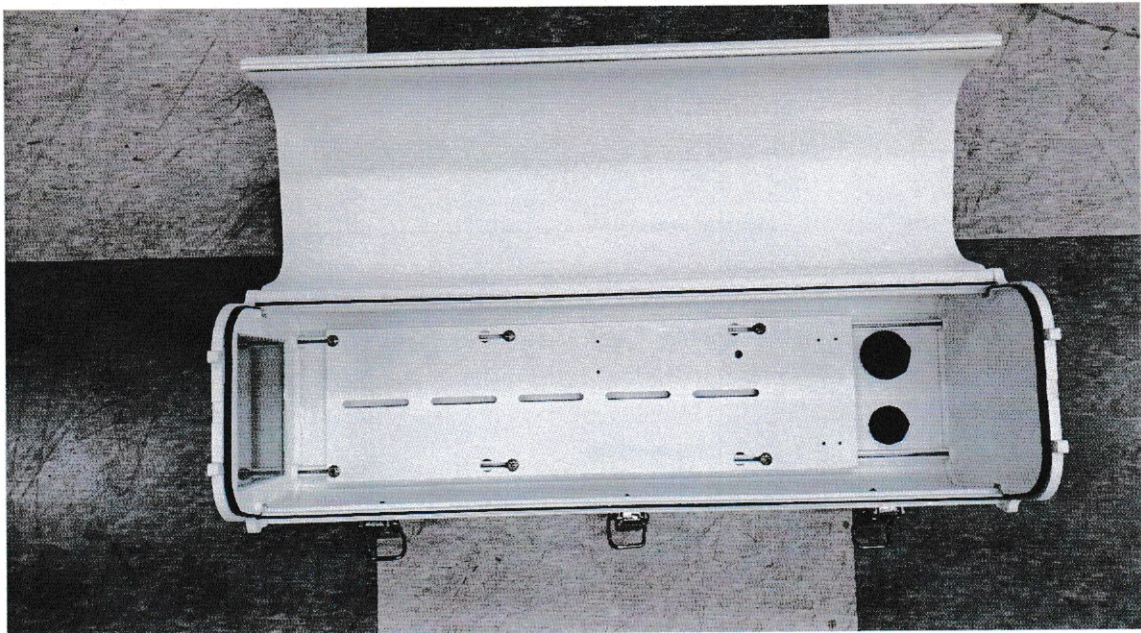
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< Photo 8 > The second characteristic numeral test



< Photo 9 >



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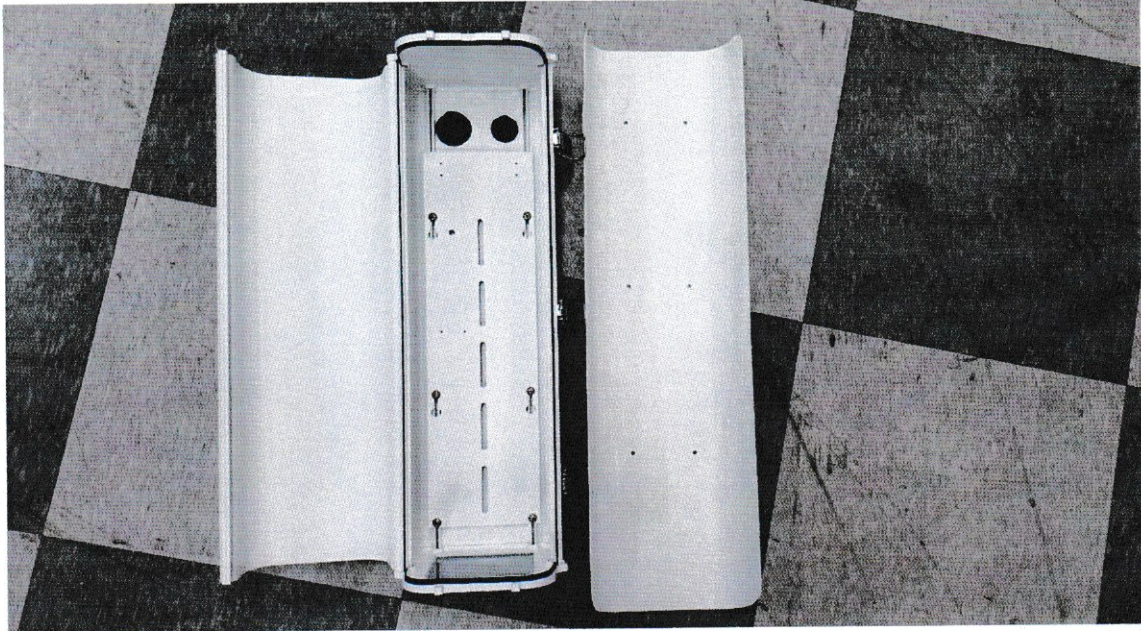


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< Photo 10 >



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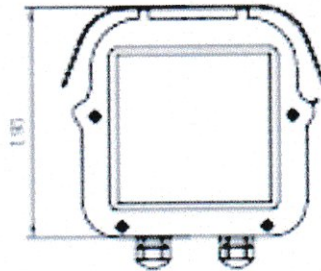
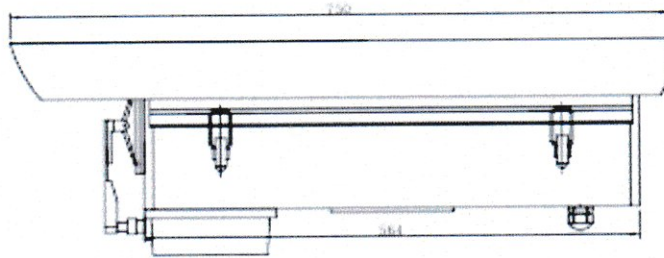
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## 2.4 Product Appearance

Enclosure Dimensions [Unit: mm]



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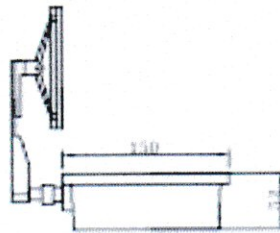
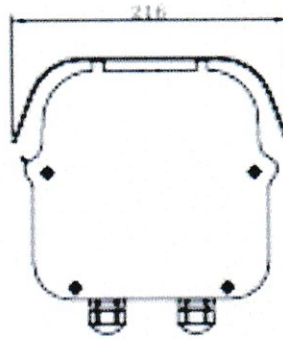
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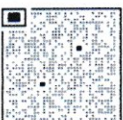


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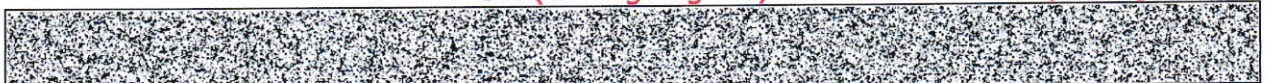
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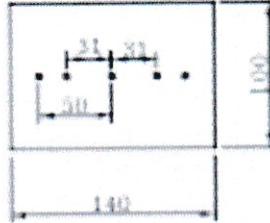






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