

Trade mark (image)

Sindoh or  or Name and address of the factory
(continued)Sindoh Co., Ltd.
1138, Suncheonhyang-ro, Baebang-eup, Asan-si, Chungcheongnam-do
31479, REPUBLIC OF KOREASindoh VINA Co., Ltd.
Lot CN15, Khai Quang Industrial Zone, Vinh Yen, 280000 Vinh Phuc,
VIETNAM

(Kevin Park)



Test Report issued under the responsibility of:

NCB TÜV SÜD PSB Pte Ltd
1 Science Park Drive, 118221 Singapore



TEST REPORT

IEC 62368-1

Audio/video, information and communication technology equipment

Part 1: Safety requirements

Report Number	: 077-2373218-100
Date of issue	: 2019-07-01
Total number of pages	: 10 pages

Applicant's name	: Sindoh Co., Ltd.
Address	: 3, Seongsuiro24(isipsa)-gil, Seongdong-gu, Seoul 04797, REPUBLIC OF KOREA

Test specification:	
Standard	: IEC 62368-1:2014 (Second Edition)
Test procedure	: CB Scheme
Non-standard test method	: N/A

Test Report Form No.	: IEC62368_1B
Test Report Form(s) Originator	: UL(US)
Master TRF	: 2014-03

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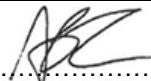

If this Test Report Form is used by non-IECEE members, the IECEE/IEC logo and the reference to the CB Scheme procedure shall be removed.

This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02.

General disclaimer:

The test results presented in this report relate only to the object tested.
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Test Item description	3D Printer	
Trade Mark	Sindoh or  or 	
Manufacturer	Same as applicant	
Model/Type reference	A1+, A1	
Ratings	100-240 V~, 50/60 Hz, 2.5 A, Class I equipment	
Testing procedure and testing location:		
<input checked="" type="checkbox"/> CB Testing Laboratory:	TÜV SÜD Korea Laboratory (TKL)	
Testing location/ address	#315 and 316, MARIO Tower, 222-12, Guro-dong, Guro-Gu, Seoul, Korea	
<input type="checkbox"/> Associated CB Testing Laboratory:	N/A	
Testing location/ address	N/A	
Tested by (name + signature)		
Approved by (name + signature)		
Testing procedure: TMP/CTF Stage 1		
Testing location/ address	Sindoh Co., Ltd. 3, Seongsuiro24(isipsa)-gil, Seongdong-gu, Seoul 04797, REPUBLIC OF KOREA	
Tested by (name + signature)	Chad. An / Engineer	
Approved by (name + signature)	Martin Kim / Manager	
Testing procedure: WMT/CTF Stage 2		
Testing location/ address	N/A	
Tested by (name + signature)		
Witnessed by (name + signature)		
Approved by (name + signature)		
Testing procedure: SMT/CTF Stage 3 or 4		
Testing location/ address	N/A	
Tested by (name + signature)		
Approved by (name + signature)		
Supervised by (name + signature)		

List of Attachments (including a total number of pages in each attachment): N/A	
Summary of testing:	
Tests performed (name of test and test clause): Clause 5.4.1.4 and B.2.6 Temperature measurements test Clause B.2.5 Input test Clause B.4 Fault condition tests	Testing location: Sindoh Co., Ltd. 3, Seongsuiro24(isipsa)-gil, Seongdong-gu, Seoul 04797, REPUBLIC OF KOREA
Summary of compliance with National Differences: List of countries addressed: European group differences and national differences, Australia/New Zealand, Sweden, Italy and Denmark	
<input checked="" type="checkbox"/> The product fulfils the requirements of IEC 62368-1:2014 and EN 62368-1:2014+A11:2017.	

Copy of marking plate:

The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.

Product (製品) : 3D Printer
 Model (モデル) : A1
 100-240V~, 50/60 Hz, 2.5 A
 Serial No. (製造機番) : 000000000001
 Manufactured (製造年月) : October, 2018
 Made in China SR-C
 Class I Laser Product
 FCC ID : 2AB83-A1
 CAN ICES-3 (A) / NMB-3 (A)

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operations.

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Product (製品) : 3D Printer
 Model (モデル) : A1+
 100-240V~, 50/60 Hz, 2.5 A
 Serial No. (製造機番) : 000000000001
 Manufactured (製造年月) : October, 2018
 Made in China SR-C
 Class I Laser Product
 FCC ID : 2AB83-A1
 CAN ICES-3 (A) / NMB-3 (A)
 Contains Transmitter Module FCC ID : 2AB83-TWFM-M311D
 Contains IC / Contient IC : 2541A-TWFMM311D  005-101364
 無線モジュール TWFM-M311D含む

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operations.

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TEST ITEM PARTICULARS:	
Classification of use by	<input checked="" type="checkbox"/> Ordinary person <input type="checkbox"/> Instructed person <input type="checkbox"/> Skilled person <input type="checkbox"/> Children likely to be present
Supply Connection	<input checked="" type="checkbox"/> AC Mains <input type="checkbox"/> DC Mains <input type="checkbox"/> External Circuit - not Mains connected - <input type="checkbox"/> ES1 <input type="checkbox"/> ES2 <input type="checkbox"/> ES3
Supply % Tolerance	<input checked="" type="checkbox"/> +10%/-10% <input type="checkbox"/> +20%/-15% <input type="checkbox"/> +____%/ -____% <input type="checkbox"/> None
Supply Connection – Type	<input checked="" type="checkbox"/> pluggable equipment type A - <input type="checkbox"/> non-detachable supply cord <input checked="" type="checkbox"/> appliance coupler <input type="checkbox"/> direct plug-in <input type="checkbox"/> mating connector <input type="checkbox"/> pluggable equipment type B - <input type="checkbox"/> non-detachable supply cord <input type="checkbox"/> appliance coupler <input type="checkbox"/> permanent connection <input type="checkbox"/> mating connector <input type="checkbox"/> other:_____
Considered current rating of protective device as part of building or equipment installation	16 A Installation location: <input checked="" type="checkbox"/> building; <input type="checkbox"/> equipment
Equipment mobility	<input type="checkbox"/> movable <input type="checkbox"/> hand-held <input type="checkbox"/> transportable <input checked="" type="checkbox"/> stationary <input type="checkbox"/> for building-in <input type="checkbox"/> direct plug-in <input type="checkbox"/> rack-mounting <input type="checkbox"/> wall-mounted
Over voltage category (OVC)	<input type="checkbox"/> OVC I <input checked="" type="checkbox"/> OVC II <input type="checkbox"/> OVC III <input type="checkbox"/> OVC IV <input type="checkbox"/> other: _____
Class of equipment	<input checked="" type="checkbox"/> Class I <input type="checkbox"/> Class II <input type="checkbox"/> Class III
Access location	<input type="checkbox"/> restricted access location <input checked="" type="checkbox"/> N/A
Pollution degree (PD)	<input type="checkbox"/> PD 1 <input checked="" type="checkbox"/> PD 2 <input type="checkbox"/> PD 3
Manufacturer's specified maximum operating ambient:	30 °C
IP protection class	<input checked="" type="checkbox"/> IPX0 <input type="checkbox"/> IP____
Power Systems	<input checked="" type="checkbox"/> TN <input type="checkbox"/> TT <input type="checkbox"/> IT - ____ V _{L-L}
Altitude during operation (m)	<input type="checkbox"/> 2000 m or less <input checked="" type="checkbox"/> <u>5000 m</u>
Altitude of test laboratory (m)	<input checked="" type="checkbox"/> 2000 m or less <input type="checkbox"/> _____ m
Mass of equipment (kg)	<input checked="" type="checkbox"/> 44.7 kg
POSSIBLE TEST CASE VERDICTS:	
- test case does not apply to the test object.....	N/A
- test object does meet the requirement	P (Pass)
- test object does not meet the requirement	F (Fail)

TESTING:	
Date of receipt of test item..... :	2019-06-19
Date (s) of performance of tests..... :	2019-06-20 to 2019-06-26
GENERAL REMARKS:	
<p>"(See Enclosure #)" refers to additional information appended to the report. "(See appended table)" refers to a table appended to the report.</p> <p>Throughout this report a <input type="checkbox"/> comma / <input checked="" type="checkbox"/> point is used as the decimal separator.</p> <p>Remark 1: This modification report is to supplement the earlier CB Ref. Cert. No. SG PSB-IV-00297 (Test Report Ref. No.: 077-2373218-000)</p> <p>Remark 2: - Revision of model differences. (See model Differences). - Addition of alternate components (PTC Heater and Air Pump Motor), See appended Table 4.1.2. - Addition of factory (Sindoh VINA Co., Ltd.).</p>	
Manufacturer's Declaration per sub-clause 4.2.5 of IEC60900-2:	
The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> Not applicable
When differences exist; they shall be identified in the General product information section.	
Name and address of factory (ies)	1. SINDOH (QINGDAO) CO., LTD. 1008 Emeisan-road, Qingdao Economics & Technology Development Zone, 266555 Qingdao, Shandong, PEOPLE'S REPUBLIC OF CHINA 2. Sindoh Co., Ltd. 1138, Suncheonhyang-ro, Baebang-eup, Asan-si, Chungcheongnam-do 31479, REPUBLIC OF KOREA 3. Sindoh VINA Co., Ltd. Lot CN15, Khai Quang Industrial Zone, Vinh Yen, 280000 Vinh Phuc, VIETNAM
GENERAL PRODUCT INFORMATION:	
Product Description –	
- The maximum ambient temperature permitted by the manufacturer (Tma): 30 °C. - This equipment is for indoor use only.	
Model Differences –	
The Model A1+ is basic model. Derived A1 is identical to basic model A1+ except for only model designation.	
Additional application considerations – (Considerations used to test a component or sub-assembly) –	
- The bulding-in type Power Supply Unit is separately CB certified according to IEC 60950-1:2005+AMD2:2013. We have accepted components comply with IEC 60950-1 as part of equipment covered by this standard without further evaluation and consideration to the appropriate use of the component in the end-product.	

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
4	GENERAL REQUIREMENTS		P
4.1.1	Acceptance of materials, components and subassemblies	(See appended Table 4.1.2)	P
4.1.2	Use of components	Certified components are used in accordance with their ratings, certifications and they comply with applicable parts of this standard. Components not certified are used in accordance with their ratings and they comply with applicable parts of IEC 62368-1 and the relevant component standard. Components, for which no relevant IEC-standard exists, have been tested under the conditions occurring in the equipment, using applicable parts of IEC 62368-1.	P
4.1.3	Equipment design and construction	Safeguards are provided to reduce the likelihood of injury or, in the case of fire, property damage.	P

5	ELECTRICALLY-CAUSED INJURY		P
5.4	Insulation materials and requirements		P
5.4.1.4	Maximum operating temperature for insulating materials	(See appended table 5.4.1.4)	P

B	NORMAL OPERATING CONDITION TESTS, ABNORMAL OPERATING CONDITION TESTS AND SINGLE FAULT CONDITION TESTS		P
B.2	Normal Operating Conditions		P
B.2.1	General requirements..... :	(See Test Item Particulars and appended test tables)	P
	Audio Amplifiers and equipment with audio amplifiers		N/A
B.2.3	Supply voltage and tolerances	+10 %/-10 %	P
B.2.5	Input test..... :	(See appended table B.2.5)	P
B.4	Simulated single fault conditions		P
B.4.2	Temperature controlling device open or short-circuited	(See appended table B.4)	P
B.4.3	Motor tests		P
B.4.3.1	Motor blocked or rotor locked increasing the internal ambient temperature	Stepping motors are used, Fan Lock and d.c. Motor Lock were conducted	P

IEC 62368-1					
Clause	Requirement + Test		Result - Remark		Verdict
4.1.2	TABLE: List of critical components				P
Object / part No.	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity ¹
2. Motor, Fan, Clutch, Solenoid					
AIR PUMP Motor	SKOOCOM ELECTRONIC CO., LTD.	SC6001PM	12 V d.c.	IEC/EN 62368-1	Tested in equipment
Alt.	SHENZHEN WEIZHEN MOTOR CO., LTD.	MT3612V04	12 V d.c.	IEC/EN 62368-1	Tested in equipment
PTC FAN HEATER	ShenZhen Lankeda Technology Co., Ltd.	LKD- PTC24V/100W	24 V d.c., 100 W	IEC/EN 62368-1	Tested in equipment
Alt.	TAIWAN KING LUNG CHIN PTC CO., LTD.	SS-0204V0202B2 Z01	24 V d.c., 100 W	IEC/EN 62368-1	Tested in equipment
Frame, Gasket	BASF SE	A3X2G5	V-0, 115 °C, Min. 0.81 mm thickness	UL 94 UL 746	UL(E41871)
Supplementary information:					
1) Provided evidence ensures the agreed level of compliance. See OD-CB2039.					
2) Description line content is optional. Main line description needs to clearly detail the component used for testing					

5.4.1.4, 6.3.2, 9.0, B.2.6	TABLE: Temperature measurements			P
	Supply voltage (V)	264 V, 60 Hz		—
	Ambient T _{min} (°C)	See below		—
	Ambient T _{max} (°C)	See below		—
	T _{ma} (°C)	30 °C		—
Maximum measured temperature T of part/at:		T (°C)		Allowed T _{max} (°C)
DC motor near heater(Air Pump Motor)		44.7		100
PTC Heater cover (Upper)		64.4		-
PTC Heater cover (Lower)		47.9		-
Ambient		30 (25.3 °C)		-
Maximum measured temperature T of part/at:		T (°C)		Allowed T _{max} (°C)

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict

Supplementary information:

Temperature T of winding:	t ₁ (°C)	R ₁ (Ω)	t ₂ (°C)	R ₂ (Ω)	T (°C)	Allowed T _{max} (°C)	Insulation class

Supplementary information:

Note 1: T_{ma} should be considered as directed by applicable requirement

Note 2: T_{ma} is not included in assessment of Touch Temperatures (Clause 9)

B.2.5	TABLE: Input test						P
U (V)	I (A)	I rated (A)	P (W)	P rated (W)	Fuse No	I fuse (A)	Condition/status
90 V a.c.	2.19	-	195.1	-	F1	2.19	Max. Normal operating condition. 50 Hz, 0.5 A loaded for USB port.
100 V a.c.	1.92	2.5	192.5	-	F1	1.92	
240 V a.c.	0.80	2.5	191.0	-	F1	0.80	
264 V a.c.	0.76	-	199.0	-	F1	0.76	
90 V a.c.	2.23	-	202.0	-	F1	2.23	Max. Normal operating condition. 60 Hz, 0.5 A loaded for USB port.
100 V a.c.	1.95	2.5	195.4	-	F1	1.95	
240 V a.c.	0.82	2.5	196.0	-	F1	0.82	
264 V a.c.	0.75	-	197.1	-	F1	0.75	

Supplementary information:

Equipment may be have rated current or rated power or both. Both should be measured

B.4	TABLE: Fault condition tests							P
Ambient temperature (°C)					20-30 °C		—	
Power source for EUT: Manufacturer, model/type, output rating . :					-		—	
Component No.	Fault Condition	Supply voltage, (V)	Test time (ms)	Fuse no.	Fuse current, (A)	T-couple	Temp. (°C)	Observation
Air pump motor	Locked	264	1h 40min	F1	0.524			Unit operated continuously and then stopped after 10 min. with displaying the message on the LCD. No components damaged. Motor body: 26.4 °C (max temperatrueer 31.4°C during the test), Ambient: 25.4 °C

Supplementary information:

S/C: Short Circuit, O/L: Transformer Overload, NCD: No Component Damage,

IP – Internal Protection occurred, NT - Tissue paper remained intact

NC - Cheesecloth remained intact, NB - No indication of dielectric breakdown

CD - Components damaged (list damaged components)

Fi – Final input current

List of test equipment used:

A completed list of used test equipment shall be provided in the Test Reports when a Manufacturer Testing Laboratory according to TMP/CTF stage 1 or WMT/CTF stage 2 procedure has been used.

Clause	Measurement / testing	Testing / measuring equipment / material used	Range used	Calibration date
B.2.5	Input test	Power meter, YOKOGAWA, WT230	Auto	2018-11-30
5.4.1.4, 6.3.2, 9, B.2.6:	Heating test	Power meter, YOKOGAWA, WT230	Auto	2018-11-30
		Recorder YOKOGAWA, MV230	400 °C	2018. 10. 23
B.4	Fault condition test	Power meter, YOKOGAWA, WT230	Auto	2018-11-30
		Recorder YOKOGAWA, MV230	400 °C	2018. 10. 23