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检测
TESTING
CNAS L0095

No.: GJW2017-3696

TEST REPORT

NAME OF SAMPLE: Plastic Enclosures (Covers & Boxes)

CLIENT: Univolt Extrusions (Dongguan) Ltd.

CLASSIFICATION OF TEST: Commission test

Vkan Certification & Testing Co., Ltd.

TEST REPORT

Name of product: Plastic Enclosures (Covers & Boxes)	Trade mark: UNIVOLT
Type/Model: Box **+ Cover**: 1. SB 1-41, SB 1-41/1, SB 1-41/2, SB 1-41/3, SB 1-41/4, SB 1-41/5, SB 1-41/6, SB 1-47, SB 1-47/1 **+ SBL 1-S, SBL 1-O**; 2. SB 2-41, SB 2-41/1, SB 2-41/2, SB 2-41/3, SB 2-47, SB 2-47/1 **+ SBL 2-S, SBL 2-O**	Sample status: —
Manufacturer: Univolt Extrusions (Dongguan) Ltd.	Commissioned by: Univolt Extrusions (Dongguan) Ltd.
Manufacturer address: Dongshan Yongfa Industrial Area, Qi Shi Town Dongguan City, Prov. Guangdong, China	Commissioner address: Dongshan Yongfa Industrial Area, Qi Shi Town Dongguan City, Prov. Guangdong, China
Quantity of sample: Group A: 15pcs(SB 1-41 + SBL 1-S); Group S: 3pcs (Other Model:B～R)	Sampled by: —
Sample identification: Group A: 1 #～15#; Group S: 1 #～3#(Other Model:S=B～R)	Sampling at (place): —
Means of receiving: Submitted by the client	Means of sampling: —
Classification of test: Commission test	Sampling date: —
Receiving date: 2017.08.23	Completing date: 2017.10.26
Tested according to: IEC 60670-1:2015	Test item: Full safety items

Test conclusion:

The samples submitted by the client are tested according to the following standards:

IEC 60670-1:2015 **Boxes and enclosures for electrical accessories for household and similar fixed electrical installations -- Part 1: General requirements**

Test result: Pass.

Seal of CVC

Date of issue: 2017.10.26

Approved by: Liu Bo Reviewed by: Li Zhongyao Tested by: Wang Huihui

Test item particulars.....:

7.1	**Nature of material**	☒ 7.1.1	Insulating
		☐ 7.1.2	Metallic
		☐ 7.1.3	Composite
		☐ 7.1.4	Natural or synthetic rubber or mixture of both
7.2	**type of installation**	☒ 7.2.1	Flush, semi-flush in solid walls, ceilings or floors
		☐ 7.2.1.1	not suitable for installation into concrete
		☒ 7.2.1.2	suitable for installation into concrete with a maximum temperature during the casting process of +60 °C
		☐ 7.2.1.3	suitable for installation into concrete with a maximum temperature during the casting process of +90 °C
		☐ 7.2.2	Flush, semi-flush in hollow walls, hollow ceilings, hollow floors or furniture
		☐ 7.2.2.1	Class Ha
		☐ 7.2.2.2	Class Hb for walls
		☐ 7.2.2.3	Class Hb for ceilings
		☐ 7.2.3	Surface mounting on walls, ceilings, floors or furniture
7.3	**type of inlets (outlets)**	☐ 7.3.1	With inlets for sheathed cables for fixed installations
		☒ 7.3.2	With inlets for flexible cables
		☐ 7.3.3	With inlets for plain or corrugated conduits
		☐ 7.3.4	With inlets for threaded conduits
		☐ 7.3.5	With inlets for other types of conductors/cables or conduits
		☐ 7.3.6	With spouts (hub)
		☐ 7.3.7	Without inlets. Inlet openings will be made during installation
7.4	**Clamping means**	☐ 7.4.1	With cable retention
		☐ 7.4.2	With cable anchorage
		☐ 7.4.3	With clamping means for flexible conduit
		☒ 7.4.4	Without clamping means
7.5	**Minimum temperatures during installation**	☒ 7.5.1	-5 °C
		☐ 7.5.2	-15 °C
		☐ 7.5.3	-25 °C
7.6	**degree of protection against access to hazardous parts and against harmful effects:**		N/A
7.7	**The degree of protection against harmful effects due to the ingress of water:**		N/A
7.8	**The degree of protection of the part mounted inside the hollow walls of the boxes classified according to 7.2.2.1**	☐ 7.8.1	IP2X
		☐ 7.8.2	>IP2X
		☐ 7.8.3	Boxes intended to receive claws
		☐ 7.8.4	Boxes intended to receive other means

7.9 • The provision for fixing accessories to boxes • The provision for fixing accessories to boxes • ☐ • 7.9.1 • boxes supplied with screws • 7.9.1 • boxes supplied with screws • • • • • • • ☒ • 7.9.2 • boxes intended to rec

Summary of test results:

1. This report is applicable to Plastic Enclosures (Covers & Boxes):
   1) Boxes **+ Covers**: SB 1-41, SB 1-41/1, SB 1-41/2, SB 1-41/3, SB 1-41/4, SB 1-41/5, SB 1-41/6, SB 1-47, SB 1-47/1 **+ SBL 1-S, SBL 1-O**. (The two covers are respectively suitable for all the boxes.)
   2) Boxes **+ Covers**: SB 2-41, SB 2-41/1, SB 2-41/2, SB 2-41/3, SB 2-47, SB 2-47/1 **+ SBL 2-S, SBL 2-O**. (The two covers are respectively suitable for all the boxes.)

2. The test report is issued based on the full tests carried out on SB 1-41 + SBL 1-S, And Test of sub-clause 8 are carried out on other types of plastic enclosures.

3. According to the client's statement, the submitted samples SB 1-41 + SBL 1-S are made from the same material at the same constructions as the samples SB 1-41/1, SB 1-41/2, SB 1-41/3, SB 1-41/4 , SB 1-41/5, SB 1-41/6, SB 1-47, SB 1-47/1 + SBL 1-O and SB 2-41, SB 2-41/1, SB 2-41/2, SB 2-41/3, SB 2-47, SB 2-47/1 + SBL 2-S, SBL 2-O except that the dimension and exterior. The details of the sample can be found in Annex 1.

4. Samples identification:

Model (Boxes)	Group	Model (Boxes)	Group	**Model (Covers)**	Group
SB 1-41	**Group A**	SB 1-47/1	Group I	**SBL 1-S**	**Group A**
SB 1-41/1	Group B	SB 2-41	Group J	**SBL 1-O**	Group P
SB 1-41/2	Group C	SB 2-41/1	Group K	**SBL 2-S**	Group Q
SB 1-41/3	Group D	SB 2-41/2	Group L	**SBL 2-O**	Group R
SB 1-41/4	Group E	SB 2-41/3	Group M	—	—
SB 1-41/5	Group F	SB 2-47	Group N	—	—
SB 1-41/6	Group G	SB 2-47/1	Group O	—	—
SB 1-47,	Group H	—	—	—	—
—	—	—	—	—	—

5. Component list table:

Object/ part no.	Manufacturer/trademark	Material	Type/ model	Technical data	Standard /approval
boxes	Univolt Extrusions (Dongguan) Ltd.	PVC	—	—	—
Covers	Univolt Extrusions (Dongguan) Ltd.	PVC	—	—	—

Remarks:

1. This report Model No. is correspond to Article No.

2. Details of the contents are as follows:

MODEL NO	ARTICLE NO
SB 1-41	SB 1/41/6x20
SB 1-41/1	SB 1/41/8x20
SB 1-41/2	SB 1/41/6x25
SB 1-41/3	SB 1/41/8x25
SB 1-41/4	SB 1/41/20&25
SB 1-41/5	SB 1/41/20&25 S
SB 1-41/6	SB 1/41/20&25 K
SB 1-47	SB 1/47/20&25
SB 1-47/1	SB 1/47/20&25 K
SB 2-41	SB 2/41/20&25
SB 2-41/1	SB 2/41/20&25 K
SB 2-41/2	SB 2/41/20 K
SB 2-41/3	SB 2/41/20&25 S
SB 2-47	SB 2/47/20&25 S
SB 2-47/1	SB 2/47/20&25 K
SBL 1-S	SBL 1-S
SBL 1-O	SBL 1-O
SBL 2-S	SBL 2-S
SBL 2-O	SBL 2-O

Annex 1: Photographs

IEC 60670-1			
Clause	Requirement - Test	Result-remark	Verdict

8	**MARKING**		P
8.1	**Boxes and enclosures are marked with:**		P
	a) name, trade mark or identification mark of the manufacturer or the responsible vendor..... :	UNIVOLT	P
	Enclosures are marked in addition with:		P
	b) IP code for degree of protection against access to hazardous part and against ingress of solid objects if higher than IP4X..... :		N/A
	c) IP code against harmful ingress of water if higher than IPX2 ..... :	IP	N/A
	d) marking on cover of flush enclosures for rough surfaces and where IP is dependent on the surface (Fig. 5)..... :	IP ^^^	N/A
	IP code is marked on the outside of the enclosure so as to be easily discernible when the enclosure is mounted and wired as for normal use		N/A
	e) type reference, which may be a catalogue number ..... :	Box + Cover : 1. SB 1-41, SB 1-41/1, SB 1-41/2, SB 1-41/3, SB 1-41/4, SB 1-41/5, SB 1-41/6, SB 1-47, SB 1-47/1 + SBL 1-S, SBL 1-O; 2. SB 2-41, SB 2-41/1, SB 2-41/2, SB 2-41/3, SB 2-47, SB 2-47/1 + SBL 2-S, SBL 2-O	P
	f) for box classified as 7.2.2.2 and 7.2.2.3 the minimum internal volume shall be marked on the inside of the enclosure		N/A
	Information marked on the boxes and enclosures or provided by the manufacturer on the smallest package unit or in the instructions of the manufacturer:		P
	g) maximum temperature during the building process if 90 ° for box classified as 7.2.1.3		N/A
	h) necessary information concerning the openings which can be made during installation for boxes and enclosures classified according to 7.3.7..... :		N/A
	i) minimum temperature during installation for boxes classified according to 7.5.2 and 7.5.3 ..... :		N/A
	j) symbol Ha for boxes classified according to 7.2.2.1, symbol Hb for boxes classified according to 7.2.2.2 and 7.2.2.3 :		N/A
	Further information given in the manufacturer's catalogue or in an instruction sheet ..... :		N/A
	Higher degree of protection achieved by the use of special parts: an instruction sheet is provided and it indicates the higher degree of protection		N/A
8.2	**Marking is durable and easily legible**		P
	Rubbing test 15 s with water and 15 s with petroleum spirit		P
	After the test: marking still legible		P

IEC 60670-1			
Clause	Requirement - Test	Result-remark	Verdict
9	**DIMENSIONS**		N/A
	Boxes and enclosures comply with the appropriate standard sheets, if any ..... :	no requirement	N/A
10	**PROTECTION AGAINST ELECTRIC SHOCK**		P
	In boxes and enclosures assembled, equipped and installed as for normal use in accordance with the manufacturer's instructions: live parts are not accessible		P
	Test probe 11 of IEC 61032 applied for 1 min with a force of 20 N do not penetrate in the internal volume of the enclosure, as show in Figure 2, which are accessible after installation		P
	Additional test at (35 ± 2) °C with probe 11 of IEC 61032 on enclosures according to 7.1.1 and 7.1.3 and 7.1.4 with parts of thermoplastic or electrometric material applied to:		P
	- all places, except membranes or the like, where yielding of insulating material could impair the safety, with a force of 75 N		P
11	**PROVISION FOR EARTHING**		N/A
11.1	**Boxes and enclosures with exposed conductive parts**		N/A
	- provided with an earthing means of low resistance		N/A
	- have provision for the fitting of such an earthing means		N/A
	Earthing means or provision for the fitting are located so that:		N/A
	- the means is readily accessible, and		N/A
	- the removal of an accessory, does not disturb the continuity of the earthing circuit, and		N/A
	- the means is not part of a removable cover		N/A
	Exposed conductive parts of covers or cover-plates are connected through a low resistance connection to the earthing means		N/A
	Resistance ≤ 0,05 Ω (Ω)..... :		N/A
	the earthing means or the provision for the fitting of such an earthing means shall be located so that:		N/A
	the means is readily accessible through the open face of the box		N/A
	the removal of an accessory mounted in the box does not disturb the continuity of the earthing circuit		N/A
	the means is not part of a removable cover, back, or side of the box		N/A
11.2	**Boxes and enclosures of insulating material classified according to 7.2.2.2 and 7.2.2.3**		N/A
	Provided with a minimum of one earthing strap with one screw terminal for earthing purposes with a connecting capacity ≥ 4 mm²		N/A

IEC 60670-1			
Clause	Requirement - Test	Result-remark	Verdict
	Design of earthing strap according to Figure 4		N/A
	Earthing strap is securely fastened to the box or enclosure		N/A
	Compliance is checked by the test in 16.3.2		N/A
11.3	**Boxes and enclosures with removable sides according to 7.1.2**		N/A
	Constructed so that the electrical bond between separable parts includes at least one threaded screw connection		N/A
11.4	**Earthing terminal threads**		N/A
	Threads of earthing terminal are not stripped		N/A
	Torque of Table 4 applied on screw (Nm)..... :		N/A
	Greater values may be used if so stated by the manufacturer		N/A
	During the test: no damage such as impairing the further		N/A
12	**CONSTRUCTION**		P
12.1	**General**		P
	Boxes and enclosures are constructed without sharp edges		P
	The inner and outer surfaces of a box or cover have the following characteristics:		P
	- not subject to peeling, scaling or flaking, and		P
	- smooth and free from blisters, crack and other defects		P
12.2	**Lids, covers or cover-plates or part of them**		P
12.2.1	Lids, covers or cover-plates or parts of them, such as protective membranes, which are intended to ensure protection against electric shock, are held in place effectively		P
	the fixing means of cover or cover plate be captive		P
12.2.2	Screw-type fixing		P
	Box or enclosure intended to accept a lid, cover or cover plate by means of screw fixing is provided with means to accommodate the intended screws		P
	Lids, covers or cover-plates whose fixing is of the screw-type		P
12.2.3	Non-screw-type fixing operable without the use of a tool or a key		N/A
12.2.3.1	a box or enclosure intended to accept a lid, cover, or cover plate with non-screw-type fixing operable without the use of a tool or a key shall be provided with means to fix the lid, cover or cover plate		N/A
	Lids, covers or cover-plates whose removable is obtained by applying a force according to the requirements in table 2 in a direction perpendicular to the mounting surface when their removal may give access with test probe B of IEC 61032		N/A

IEC 60670-1			
Clause	Requirement - Test	Result-remark	Verdict
	- to live parts		N/A
	- to non-earthed conductive parts separated from live parts by basic insulation		N/A
	- only to insulating parts, earthed conductive parts, conductive parts separated from live parts by double or reinforced insulation, or live parts of SELV circuits according to IEC 61140 having a voltage ≤ 25 V a.c. or 60 V d.c.		N/A
12.2.3.2	Verification of the non-removal of the lids, covers or cover-plates		N/A
	Force according to Table 2 applied for 1 min in a direction perpendicular to the mounting surface .. :	10 N / 20 N / 40 N / 80 N	N/A
	Lids, covers or cover-plates not come off		N/A
	For flush-mounting boxes or enclosures, test repeated on new specimens with a sheet of hard material, (1 ± 0,1) mm thick, fitted on the wall around the supporting frame according to Figure 5		N/A
	Lids, covers or cover-plates not come off		N/A
12.2.3.3	Verification of the removal of the lids, covers or cover-plates		N/A
	Force not exceeding 120 N applied 10 times in a direction perpendicular to the mounting/supporting surface: lids, covers or cover-plates come off		N/A
	After the test: no damage		N/A
	For flush-mounting boxes or enclosures, test repeated on new specimens with a sheet of hard material, (1 ± 0,1) mm thick, fitted on the wall around the supporting frame according to Figure 5		N/A
	Force not exceeding 120 N applied 10 times in a direction perpendicular to the mounting/supporting surface: lids, covers or cover-plates come off		N/A
	Lids, covers or cover-plates come off		N/A
	After the test: no damage		N/A
12.2.3.4	Verification of the outline of lids, covers and cover-plates		N/A
	Gauge of Figure 6 applied according to Figure 7 for verification of the outline of lids, covers or cover-plates: distances between face C of gauge and outline of side under test, not decrease ..... :	complying / not complying	—
12.2.3.5	Verification of grooves, holes and reverse tapers		N/A
	Gauge of Figure 9 applied according to Figure 10 with a force of (1 ± 0,2) N: gauge not enter more than 1 mm ..... :	complying / not complying	—
12.2.4	Non screw-type fixing operable with the use of a tool or key		N/A
	Lids, covers or cover-plates whose fixing is not dependent on screws and whose removal is obtained by using a tool and/or a key according to the manufacturer's instructions: tests according to 12.2.3		N/A
	Force not exceeding 120 N applied in a direction perpendicular to the mounting/supporting surface: lids, covers or cover-plates need not come off		N/A

IEC 60670-1			
Clause	Requirement - Test	Result-remark	Verdict
	For flush-mounting boxes or enclosures, test repeated on new specimens with a sheet of hard material, (1 ± 0,1) mm thick, fitted on the wall around the supporting frame according to Figure 5		N/A
	Lids, covers or cover-plates not come off		N/A
12.3	**Drain holes**		N/A
	Surface and semi-flush mounting enclosures having IPX1 to IPX6 allow the opening of a drain hole ≥ 5 mm in diameter (mm Ø) or 20 mm^2 in area (mm^2) with a width or length ≥ 3mm (mm) ..... :		N/A
	Drain holes: effective		N/A
12.4	**Mounting of enclosures**		P
	Enclosures have provisions for their suitable attachment according to the method of installation		P
	Conductive parts of fixing means inside the box or enclosure are surrounded by insulation which projects above the top of the fixing means by an amount of ≥ 10 % of the maximum width of the cavity for the fixing means (mm) ..... :	10% of mm ≥ mm	N/A
12.5	**Boxes and enclosures with inlets for flexible cables**		P
	Inlets (outlets) provided in boxes and enclosures classified according to 7.3.2, the flexible cables can be easily introduced, and		P
	- no damage the flexible cable where it enter, or		P
	- enclosure impairing its further use		P
12.6	**Boxes and enclosures with inlets for applications other than flexible cables**		N/A
	Inlet openings classified according to 7.3 other than 7.3.2, if any, allow the introduction of:		N/A
	- a conduit or a suitable fitting, and/or		N/A
	- the protective covering of the cable		N/A
	Inlet opening for conduit entries:		N/A
	- capable of accepting either conduits of sizes, or a combination of sizes, according to IEC 60423 and/or IEC 60981		N/A
	- same requirement in at least two inlet openings if there are more than one		N/A
12.7	**Boxes and enclosures with a cable anchorage(s)**		N/A
	In boxes and enclosures classified according to 7.4.2 the connection of the conductors of the flexible cable are relieved from strain		N/A
	Clear how relief from strain and prevention of twisting is intended to be effected		N/A
	Cable anchorages are:		N/A
	- suitable for the different types of flexible cable		N/A
	- at least one part of it is integral with, or permanently fixed to, one of the component parts of the box		N/A

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Clause	Requirement - Test	Result-remark	Verdict
	- of insulating material or provided with an insulating lining fixed to the metal parts		N/A
	Test of effectiveness of the cable anchorage:		N/A
	- external dimensions of flexible cable (mm) ..... :		—
	- clamping screws tightened with a torque equal to 2/3 of that specified in Table 4 (Nm) .....:		—
	- glands tightened with a torque equal to that specified in Table 5 .....:		—
	It is not possible to push the flexible cable into the specimen by more than 1 mm with a force specified in Table 3 (N) .....:		N/A
	Pull force as specified in Table 3 applied 50 times for 1 s (N) .....:		—
	Torque as specified in Table 3 applied for (15 ± 1) s (Nm).....:		—
	After the test: displacement ≤ 2 mm (mm).....:		N/A
	Cable anchorage: no damage		N/A
12.8	**Boxes and enclosures with cable retention means**		N/A
	Cable retention means of boxes and enclosures classified according to 7.4.1 retain the cable in place		N/A
	Boxes and enclosures according to 7.5.2 or 7.5.3, tested at (-15 ± 2) °C and (-25 ± 2) °C respectively		N/A
	Test with cables as declared by the manufacturer, fitted according to the manufacturer's instructions and loaded with an axial force of (20 ± 1) N applied for 1 min:		N/A
	Type of cable/maximum nominal cross-sectional area (mm^2) .....:		—
	After the test: displacement ≤ 3 mm (mm).....:		N/A
	Type of cable/minimum nominal cross-sectional area (mm^2) .....:		—
	After the test: displacement ≤ 3 mm (mm).....:		N/A
12.9	**Knock-out inlets (outlets) intended to be removed by mechanical impact**		P
12.9.1	General		P
	It is possible to remove knock-out by mechanical impact without damaging the box		P
	Chips or burrs are not accepted in knock-out for cables		P
	Chips and burrs are disregarded in knock-out for conduits and/or for use with a grommet or a membrane		N/A
	In order to close an open knock-out in a box or an enclosure according 7.1.2 a blanking-plug used without a locknut:		N/A
	- not become dislodged, and		N/A
	- its effectiveness not be impaired, and		N/A

IEC 60670-1			
Clause	Requirement - Test	Result-remark	Verdict
	- it fulfil all requirements for knock-outs		N/A
12.9.2	Knock-out retention		P
	Boxes and enclosures having knock-outs, accessible after installation by means of a 6 mm diameter mandrel with a flat end that:		P
	- not provide access to live parts, a force of (30 ± 1) N applied for (15 ± 1)s		N/A
	- provide direct access to live parts, a force of (40 ± 1) N applied for (60 ± 1) s		P
	Box with multi-stage knock-outs, the force applied to the smallest		P
	During the test: knock-out remains in place		P
	Degree of protection unchanged 1 h after the test		P
12.9.3	Knock-out removal		P
	Removal test of knock-outs with a tool as stated by the manufacturer, without conditioning:		P
	During the test: no displacement of a larger stage of multi-stage knock-outs when a smaller stage is removed		P
	After the test: no sharp edges, box and enclosure is not damaged		P
	Removal test of knock-outs with a tool as stated by the manufacturer, immediately following a conditioning at the minimum temperature specified according to 7.5 for 5 h ± 10 min (boxes and enclosures according to 7.1.1 or 7.1.3)		P
	Test temperature (°C)..... :	-5	—
	During the test: no displacement of a larger stage of multi-stage knock-outs when a smaller stage is removed		P
	After the test: no sharp edges, box and enclosure is not damaged		P
12.9.4	Flat surfaces surrounding knock-outs		N/A
	Knock-outs intended for the use of grommets, glands or fittings shall be located in flat surfaces		N/A
	projections in the flat surface shall be prohibited		N/A
12.10	**Screw fixings**		P
	Fixing means effected by screws withstand mechanical stresses		P
	Screw or other fixing means made from insulating material without standardized thread are tested according to the manufacturer's instruction		P
	Thread-forming or thread-cutting screws used only if supplied together with one of the pieces with which they are intended to be inserted		N/A
	Verification of the mechanical strength of screws	See appended table 12.10	P
12.11	**Fixing of boxes and enclosures classified according to 7.2.1**		P

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Clause	Requirement - Test	Result-remark	Verdict
	Fixing means provided for flush type boxes and enclosures other than for hollow walls		P
	Screws not supplied with box or enclosures can be provided according to the manufacturer's instruction		P
	Screws, additional mechanical supports or design features, are considered adequate fixing means		P
	Boxes and enclosures not fulfilling at least one of the above requirement and having an internal volume less than 400 cm³ tested as follow:		N/A
	- the block is filled by the following material……..:		N/A
	- assembly is kept at ambient temperature for 10 (+1/0) days		—
	- auxiliary device described in Figure 13 is mounted on the specimen and the screw are tightened with a torque equal to 2/3 of that specified in table 4..... :		—
	After the test, displacement of the specimen from the mounting block ≤ 0,5 mm:		N/A
12.12	**Boxes and enclosures classified according to 7.2.2.1**		N/A
	Boxes and enclosures for hollow walls or the like classified according to 7.2.2.1 provide suitable means for fixing the box or the enclosure to hollow walls , hollow ceilings, hollow floor or furniture		N/A
	Fixing means not rely the on the cable management system		N/A
	Box or enclosure mounted in a test wall:		N/A
	- according to the manufacturer's instructions		—
	- sheet of plywood 500 mm wide x 500 mm high, (10 ± 1) mm thick		—
	a) Pull and torque test: lever loaded with a torque of 3 Nm (Figure 15a) and a force of 100 N (Figure 15b) for 1 min		N/A
	After this tests: no damage, displacement of the lever no more than 2 ° (°)..... :		N/A
	b) Displacement test: lever loaded with a torque of 3 Nm (Figure 15c) for 1 min		N/A
	After the test: edge of the box not displaced by more than 1 mm (mm)..... :		N/A
12.13	**boxes and enclosures classified according to 7.2.2.2 and 7.2.2.3**		N/A
12.13.1	boxes and enclosures for hollow walls or the like classified according to 7.2.2.2 and 7.2.2.3 shall have suitable means for fixing the box to hollow walls and hollow ceiling		N/A
	the fixing means shall not rely on cable management system		N/A
	the compliances is checked by the tests in 12.13.2, 12.13.3, 12.13.4 or 12.13.6 as applicable		N/A
12.13.2	Boxes intended for mounting to a wood structural member of a wall		N/A
	Box mounted to a (45 x 90) mm wood structural member in a vertical position; force of 225 N applied for 5 min		N/A

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Clause	Requirement - Test	Result-remark	Verdict
	After the test: no pulling out of the nails or screws		N/A
	No movement of the face of the box of more than 3 mm (mm) ..... :		N/A
12.13.3	Boxes intended for mounting to a wood structural member of a ceiling		N/A
	Box mounted to a (35 x 190) mm wood structural member in vertical position; force of 225 N applied for 1 min		N/A
	During the test: deflection of the face of the box does not exceed 6 mm (mm) ..... :		N/A
12.13.4	Boxes intended for mounting to a steel-stud structural member of a wall		N/A
	Box mounted to a steel-stud structural member according to Figure 16; force of 180 N applied for 5 min in the direction to push the box into the wall opening		N/A
	During the test with a force of 180 N applied for 5 min in the direction to push the box into the wall opening: deflection of the box does not exceed 2 mm (mm)..... :		N/A
	During the test with a force of 180 N applied for 5 min in the direction to pull the box out of the wall opening: deflection of the box does not exceed 2 mm (mm)..... :		N/A
12.13.5	Internal volume of boxes and enclosures classified according to 7..2.2.2 and 7.2.2.3		N/A
	Verification of the declared internal volume for boxes, enclosures, raised covers and box extensions		N/A
	Verification of the volume of each partitioned section for box or enclosure with a partition		N/A
	Checked by the test of clause 12.16		N/A
12.13.6	Boxes intended for mounting in a finished structure		N/A
	Supporting means not crack or break nor the face of the box be permanently displaced more than 3,2 mm from the plane of the face of the test surface when measured 1 minute after the test load is removed		N/A
	Six boxes intended for use in walls or eight boxes intended for use in ceilings are installed in prescribed plywood sheet or in a finished surface in accordance with the manufacturer's instructions		—
	Screws for the box supporting means are tightened as follow:		N/A
	- in accordance with the manufacturer's instructions or		N/A
	- in accordance with column 4 of Table 4.		N/A
	Following installation, a force of 222 N is applied for 5 min		N/A
12.14	**Cable gland entry**		N/A
	Torque test: glands provided with a metal rod tightened and loosened 10 times with a torque specified in Table 5 for 1 min ± 5 s		N/A
	- diameter of test rod (mm) ..... :		—
	- type of material (metal / insulating)..... :		—
	- torque (Nm) ..... :		—
	After the test: no damage		N/A

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Clause	Requirement - Test	Result-remark	Verdict
12.15	**Boxes and enclosures with inlets (outlets) or spouts (hubs) for conduits**		N/A
12.15.1	Boxes and enclosures classified according to 7.3.4 and conical spouts as in 7.3.6 withstand the tests of 12.15.2, 12.15.3 and 12.15.4		N/A
	Boxes and enclosures classified according to 7.4.3 withstand the tests of 12.15.2 and 12.15.3		N/A
12.15.2	Enclosures with inlet spout for conduits: a minimum size piece of conduit pressed for 1 min ± 5 s with a force of (100 ± 2) N		N/A
	During the test: inlet spout prevents further entry of the conduit into the box		N/A
12.15.3	Pull-out test after the test according to 12.15.2: conduit with the minimum size corresponding to the insert opening loaded for 1 min with a tensile force of (20 ± 2) N		N/A
	During the test: conduit not come loose from the inlet spout of the enclosure		N/A
12.15.4	Resistance to bending strain of an inlet spout: piece of conduit inserted into the inlet spout with a compressible force of (100 ± 2) N and loaded with a bending moment of 3 Nm for 1 min in six different directions with an interval of (60 ± 2) °		N/A
	During the test: inlet spout not come loose or damaged and conduit stays within the inlet spout		N/A
12.16	**Internal volume of boxes and enclosures**		N/A
	Declared internal volume of the box or enclosure and each partitioned section of a box or enclosure, raised cover and box extension is measured		N/A
	The volume of a side pocket provided to increase the volume of a box or enclosure is calculated using a depth-of-pocket not more than the smallest dimension of the opening into that side pocket		N/A
	Difference in the volume of water in the measuring cylinder measured before and after the filling of the box, enclosure or raised cover indicates the volume of the box .....:		N/A

13	**RESISTANCE TO AGEING, PROTECTION AGAINST INGRESS OF SOLID OBJECTS AND AGAINST HARMFUL INGRESS OF WATER**		P
13.1	Resistance to ageing		P
13.1.1	Specimens of insulating and composite boxes and enclosures, glands, grommets and replaceable membranes placed in a heating cabinet at (70 ± 2) °C for (168 + 4) h and then kept at room temperature for (96 + 4) h		P
	Glands tightened with a torque equal to 2/3 of the torque applied during the test of 12.14 (Nm) .....:		—
	Greater torque value stated by the manufacturer, if any (Nm) .....:		—
	After the test: no harmful deformation or similar damage		P
13.1.2	Grommets, blanking-plug and entry membranes in inlet openings and protecting membranes are reliably fixed and are not displaced by the mechanical and thermal stresses occurring in normal use		N/A

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Clause	Requirement - Test	Result-remark	Verdict
	Specimens that have been subjected to the treatment specified in 13.1.1 placed in a heating cabinet at (40 ± 2) °C for 2 h ± 15 min		N/A
	Immediately after this period the tip of test probe 11 of IEC 61032 is applied for (5 ± 1) s with a force of (30 -2) N. During the tests: grommets, blanking-plug and/or membranes not deformed to such an extent that live parts of any included accessory become accessible		N/A
	Grommets, blanking-plug and/or membranes likely to be subjected to an axial pull: axial pull of (30 -2) N applied for (5 ± 1) s. During the tests: grommets, blanking-plug and/or membranes not deformed to such an extent that live parts of any included accessory become accessible		N/A
	Test repeated on same enclosures fitted with grommets, blanking-plug and/or membranes not subjected to any treatment		N/A
	After the test: no harmful deformation, cracks or similar damage		N/A
13.1.3	Grommets, blanking-plug and entry membranes in inlet openings of boxes and enclosures classified according to 7.5.2 and 7.5.3: introduction of the cables and conduit permitted when the ambient temperature is low		N/A
	Test on enclosures fitted with grommets, blanking-plug and/or membranes not subjected to any ageing treatment kept for 2 h in a refrigerator		N/A
	Test temperature (°C) .....:		—
	Immediately after conditioning: it is possible to pierce any blind grommets, blanking-plug and entry membranes and to introduce cables and conduit of the maximum diameter intended		N/A
	After the test: no harmful deformation, cracks or similar damage		N/A
13.2	Protection against the ingress of solid objects		N/A
	Enclosures provide a degree of protection against the ingress of solid objects in accordance with the declared IP code .....:		N/A
	for box and enclosures classified according to 7.2.2.1 the above requirements applies also to the part mounted inside the hollow wall according to classification 7.8		N/A
	compliance is checked by the appropriate test of IEC 60529 under the following tests conditions		N/A
	Enclosures mounted as in normal use according to the manufacturer's instructions		N/A
	box and enclosures classified according to 7.2.2.1, the test on the part mounted inside the wall is made on a box mounted so that the rear part is accessible for the test		N/A
	unless otherwise stated herein, where the enclosure has drain holes, at least one open drain hole shall be in the lowest position		N/A

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Clause	Requirement - Test	Result-remark	Verdict
	- type of cable, smallest cross-sectional area (mm²) .....:		—
	- type of cable, largest cross-sectional area (mm²):		—
	Enclosures mounted as in normal use with screwed glands or grommets fitted with conduits as declared by the manufacturer:		N/A
	- smallest diameter or dimensions (mm) .....:		—
	- largest diameter or dimensions (mm).....:		—
	Fixing screws of the cover or cover-plate tightened with a torque equal to 2/3 of the value of Table 4 used for the test of 12.10 (Nm) .....:		—
	Greater torque value stated by the manufacturer, if the relevant information is provided (Nm) .....:		—
	- IP5X: test performed as specified in IEC 60529 category 2 with the drain holes, if any, not opened		N/A
	- IP≤4X: test probe does not pass through any opening other than drain holes		N/A
	- IP≤4X: test probe applied on drain holes does not touch live parts within the enclosure		N/A
	- IP5X: dust does not cover the whole inner surface		N/A
	- IP6X: there is no dust inside the box or enclosure		N/A
13.3	Protection against harmful ingress of water		N/A
13.3.1	Enclosures with IP>X0 provide a degree of protection against harmful ingress of water in accordance with the declared IP code .....:	IP	N/A
	Enclosure dimensions: reference surface S (m²) / perimeter (m)..... :		—
	Appropriate test performed on surface, flush or semi-flush enclosures as specified in IEC 60529 under the following conditions:		N/A
	- dimension S ≤ 0,04 m² or perimeter ≤ 0,8 m according to 13.3.2 and 13.3.3		N/A
	- dimension S > 0,04 m² and perimeter > 0,8 m according to 13.3.2 and 13.3.4		N/A
	Enclosures with screwed glands or grommets fitted with cables as declared by the manufacturer:		N/A
	- type of cable, smallest cross-sectional area (mm²) .....:		—
	- type of cable, largest cross-sectional area (mm²):		—
	Enclosures with screwed glands or grommets fitted with conduits as declared by the manufacturer:		N/A
	- smallest diameter or dimensions (mm) .....:		—
	- largest diameter or dimensions (mm).....:		—
	Fixing screws of the cover or cover-plate tightened with a torque equal to 2/3 of the value of Table 4 used for the test of 12.10 (Nm) .....:		—

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Clause	Requirement - Test	Result-remark	Verdict
13.3.2	Surface-mounting enclosures mounted as for normal use		N/A
	Flush type and semi-flush type enclosures fixed in a test wall:		N/A
	- according to the manufacturer's instructions		N/A
	- according to Figure 19		N/A
	Enclosures fitted with cables having conductors of the largest and smallest cross-sectional area as declared by the manufacturer.....:		—
	IPX3 and IPX4 enclosures: use of oscillating tube (Figure 4) or spray nozzle according to IEC 60529 (Figure 5) .....:		—
13.3.3	Immediately after the test no more than 0,2 ml x S (cm²) water in the enclosure (ml).....:		N/A
	Specimens withstand an electric strength test specified in 14.3 started within 5 min of the completion of IP test		N/A
13.3.4	Immediately after the test: indicator paper still dry		N/A
14	**INSULATION RESISTANCE AND ELECTRIC STRENGTH**		**P**
14.1	**Insulation resistance and electric strength of enclosures classified according to 7.1.1, 7.1.3 and 7.1.4 is adequate**		P
	Specimens placed in a humidity cabinet containing air with relative humidity between 91 % and 95 % and air temperature between 20 °C and 30 °C for:		P
	- 2 days (48 h) for enclosures classified IPX0		P
	- 7 days (168 h) for enclosures classified IP>X0		N/A
	After this treatment: no damage		P
14.2	**Insulation resistance measured 1 min after application of 500 V d.c.**	See appended table 14.2	P
14.3	**Electric strength: a.c. test voltage applied for 1 min**	See appended table 14.3	P
15	**MECHANICAL STRENGTH**		P
15.1	**Boxes and enclosures have adequate mechanical strength**		P
	Non-metallic boxes and enclosures for use in cast concrete classified according to 7.2.1.2 or 7.2.1.3 : by the test of 15.2		P
	Non-metallic boxes and enclosures for use in cast concrete and able to withstand 90°C during the process classified according to7.2.1.3, by the test of 15.3		N/A
	for non-metallic boxes and enclosures classified according to :		N/A
	a) 7.2.3, by the test of 15.4		N/A

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Clause	Requirement - Test	Result-remark	Verdict
	b) 7.2.11 or 7.2.2 and also classified according to :7.5.2 or 7.5.3, by the test of 15.4		N/A
	for non-metallic boxes and enclosures, the parts which are intended to be accessible after completion of the building process, by the test of 15.4		N/A
	for boxes and enclosures classified according 7.1.4, by the test of 15.5		N/A
	when an enclosure is too large to fit the test apparatus shown in annex D using the spring hammer (of IEC 600068-2-75:1997)		N/A
15.2	**Impact test at low temperature**		P
	- (-5 ± 2) °C for boxes and enclosures classified according to 7.5.1		P
	- (-15 ± 2) °C for boxes and enclosures classified according to 7.5.2		N/A
	- (-25 ± 2) °C for boxes and enclosures classified according to 7.5.3		N/A
	Specimens subjected to 5 blows with a mass of 1 kg falling from a height of 100 mm: no damage		P
	after the test no damage		P
15.3	Compression test		N/A
15.3.1	Boxes and enclosures are placed in a heating cabinet at (90 ± 5) °C for (60 + 15) min		N/A
	After cool down to ambient temperature: neither deformation nor damage		N/A
	Boxes and enclosures then placed between two flat hardwood plates and loaded with a force of (500 ± 5) N for 1 min ± 5 s		N/A
	No deformation or damage		N/A
15.4	**Impact test for boxes and enclosures**		N/A
	Specimens subjected to blows by means of an impact test apparatus as described in IEC 60068-2-75 (test EHA) with equivalent mass of 250 g	See appended table 15.4	N/A
	Boxes classified according to 7.5.2 and 7.5.3 performed at the following temperature:		N/A
	- (-15 ± 2) °C for boxes classified according to 7.5.2		N/A
	- (-25 ± 2) °C for boxes classified according to 7.5.2		N/A
	After the test: no damage		N/A
15.5	**Compression test for enclosures made of nature or synthetic rubber or a mixture of both**		N/A
	box and enclosure classified according to 7.1.4 shall withstand a load which can be expected in normal use		N/A
	a) Cover loaded with a force of 50N for 1min, deflecting ≤ 3mm		N/A
	b) pressure of 50N/cm² for 1 min.		N/A

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Clause	Requirement - Test	Result-remark	Verdict
	after the test, no damage and compliance with this standard		N/A

16	**RESISTANCE TO HEAT**		P
16.1	**Part of insulating material necessary to retain current-carrying parts**		N/A
	Parts of insulating material necessary to retain current-carrying parts and/or parts of the earthing circuit in position: ball-pressure test according to IEC 60695-10-2 at (125 ± 2) °C for (60 +5) min	See appended table 16.1-16.2	N/A
16.2	**Part of insulating material not necessary to retain current-carrying parts**		P
	Parts of insulating material not necessary to retain current-carrying parts and/or parts of the earthing circuit in position, even though in contact with them, and parts necessary to retain earthing terminals in position: ball-pressure test according to 16.1 but at (70 ± 2) °C	See appended table 16.1-16.2	P
	Parts of insulating material of flush-mounted enclosures classified according to 7.6.2: ball-pressure test according to 16.1 but at (90 ± 2) °C	See appended table 16.1-16.2	N/A
16.3	**Boxes and enclosures of insulating materials classified according to 7.2.2.2 or 7.2.2.3**		N/A
16.3.1	Mechanical strength		N/A
	Boxes and enclosures of insulating materials classified according to 7.2.2.2 or 7.2.2.3 :adequate mechanical strength at high temperature		N/A
	Rigid crossbar (Figure 25) secured across the face of the box with screws tightened with a torque according to Table 4 (Nm)..... :		—
	Total force of 180 N applied for 24 h to the face of the box at:		N/A
	- (80 ± 2) °C for boxes and enclosures classified according to 7.2.2.2		N/A
	- (105 ± 2) °C for boxes and enclosures classified according to 7.2.2.3		N/A
	After the assembly has been cooled down to ambient temperature:		N/A
	- screws not have pulled out more than 6,3 mm (mm)..... :		N/A
	- torque used for removal the screws not exceeding 2,3 Nm (Nm)..... :		N/A
16.3.2	Part of insulating material necessary to retain current-carrying parts of earthing circuit		N/A
	Parts of insulating material necessary to retain earthing strap subjected to a pull test of 45 N for 5 min as follow:		N/A
	- one specimen tested in the condition as delivered and		N/A
	- one specimen tested after conditioning at 90 °C for 168 h		N/A
	Thread of the earthing terminal not stripped when applying a torque according to Table 4 (Nm).....		N/A

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Clause	Requirement - Test	Result-remark	Verdict
	After each test: the earthing strap not become detached from the specimen		N/A
17	**CREEPAGE DISTANCES, CLEARANCES AND DISTANCES THROUGH SEALING COMPOUND**		N/A
	Void		—
18	**RESISTANCE OF INSULATING MATERIAL TO ABNORMAL HEAT AND FIRE**		**P**
	Glow-wire test according to Clauses 4 to 10 if IEC 60695-2-11	See appended table 18	P
19	**RESISTANCE TO TRACKING**		N/A
	Parts of insulating material retaining live parts in position of boxes and enclosures having IP>X0: PTI 175, 50 drops, solution A of IEC 60112	See appended table 19	N/A
20	**RESISTANCE TO CORROSION**		N/A
	Test made after having removed all grease by immersion in a degreasing agent for (10 ± 1) min, (10 ± 1) min in a 10 % solution of ammonium chloride, (10 ± 1) min in a box containing air saturated with moisture and (10 ± 1) min at (100 ± 5) °C		N/A
	No signs of rust		N/A

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Clause	Requirement - Test	Result-remark	Verdict

12.10	**TABLE: mechanical strength of screws**				P
threaded part identification (e.g. fixing means for cover)	diameter of screw thread (mm)	column number – Table 4 (I, II, III or IV)	applied torque – Table 4 (Nm)	times (5/10)	no damage
fixing means for cover	3.36	II	0.8	5	P
supplementary information:					

14.2	**TABLE: insulation resistance**		P
test voltage applied between:	measured (MΩ)	required (MΩ)	
The body and a metal foil in contact with the internal surface of enclosure	500	≥5	
supplementary information:			

14.3	**TABLE: electric strength**		P
	rated insulation voltage (V) .....:		—
test voltage applied between:	test voltage (V)	flashover / breakdown (Yes/No)	
The body and a metal foil in contact with the internal surface of enclosure	2000	No	
supplementary information:			

15.4	**TABLE: impact test**			N/A
part of enclosure tested per Table 7 (A, B, C, D, E, F, G)	Total number of blows per part – Figure 10	height of fall (mm)	comments	
supplementary information:				

16.1-16.2	**TABLE: ball pressure test of insulating materials**		P
	allowed impression diameter (mm) .....:	≤ 2 mm	—
part under test	test temperature (°C)	impression diameter (mm)	
Covers	70	1.6	
Boxes	70	1.5	
supplementary information:			

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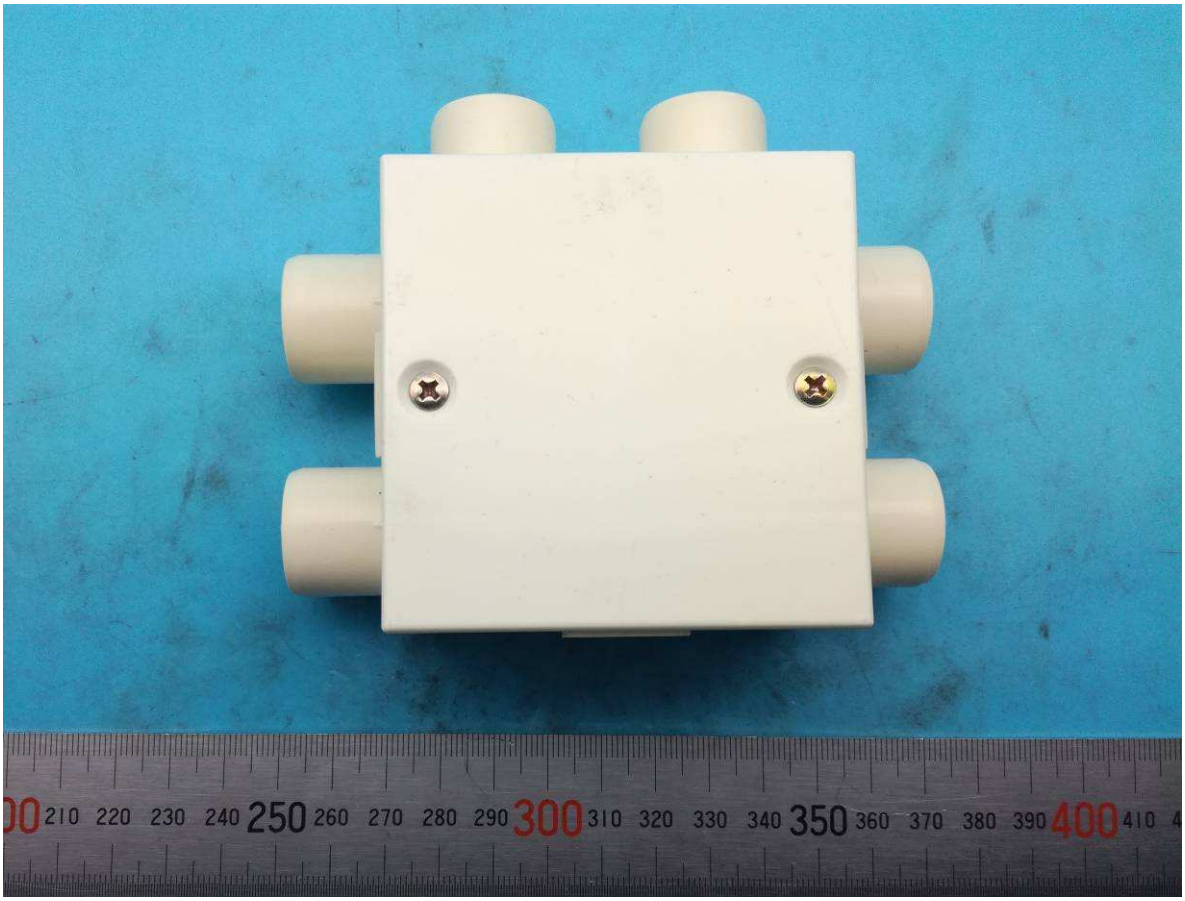
Clause	Requirement - Test	Result-remark	Verdict

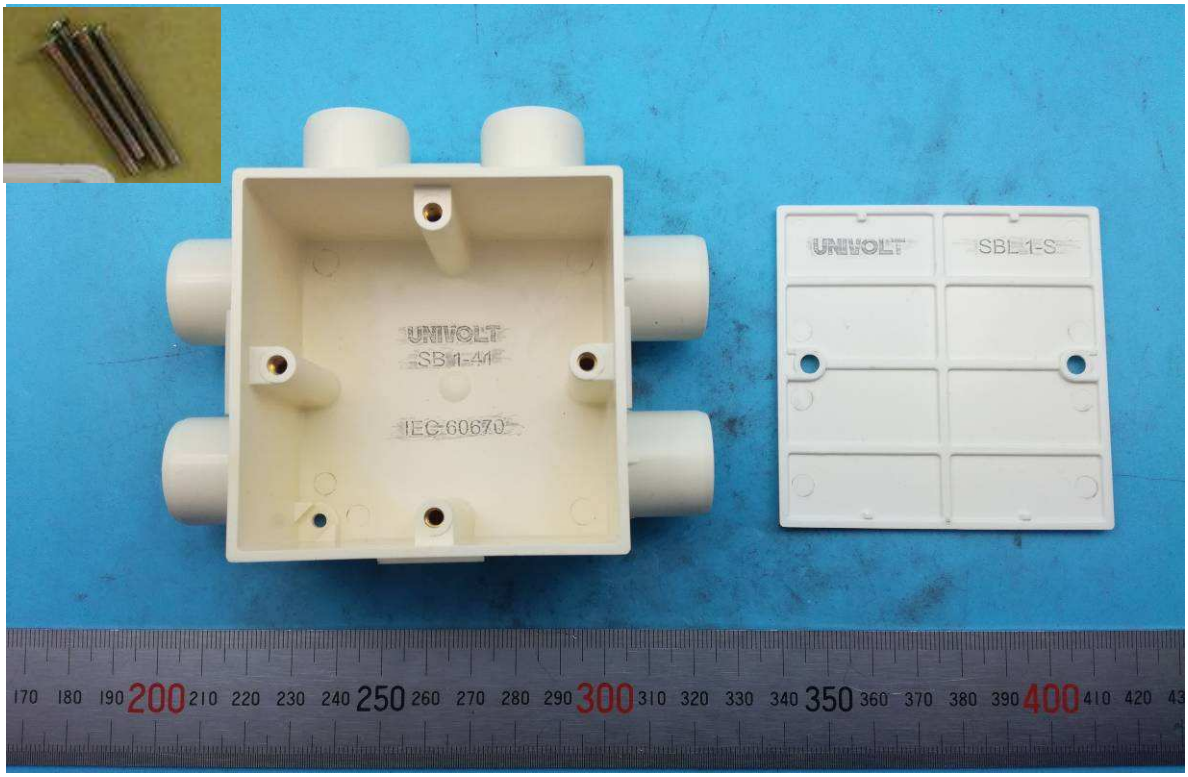
18	**TABLE: glow-wire test**				P
part under test	material designation	test temperature (°C)	visible flame and sustained glowing (Y/N)	flames and glowing extinction time	ignition of the tissue paper (Y/N)
Covers	—	650	N	0	N
Boxes	—	650	N	0	N
supplementary information:					

19	**TABLE: resistance to tracking**			N/A
part under test	material designation	test voltage (V)	flashover / breakdown (Yes/No)	
		175		
supplementary information:				

ANNEX 1
PHOTOGRAPHS

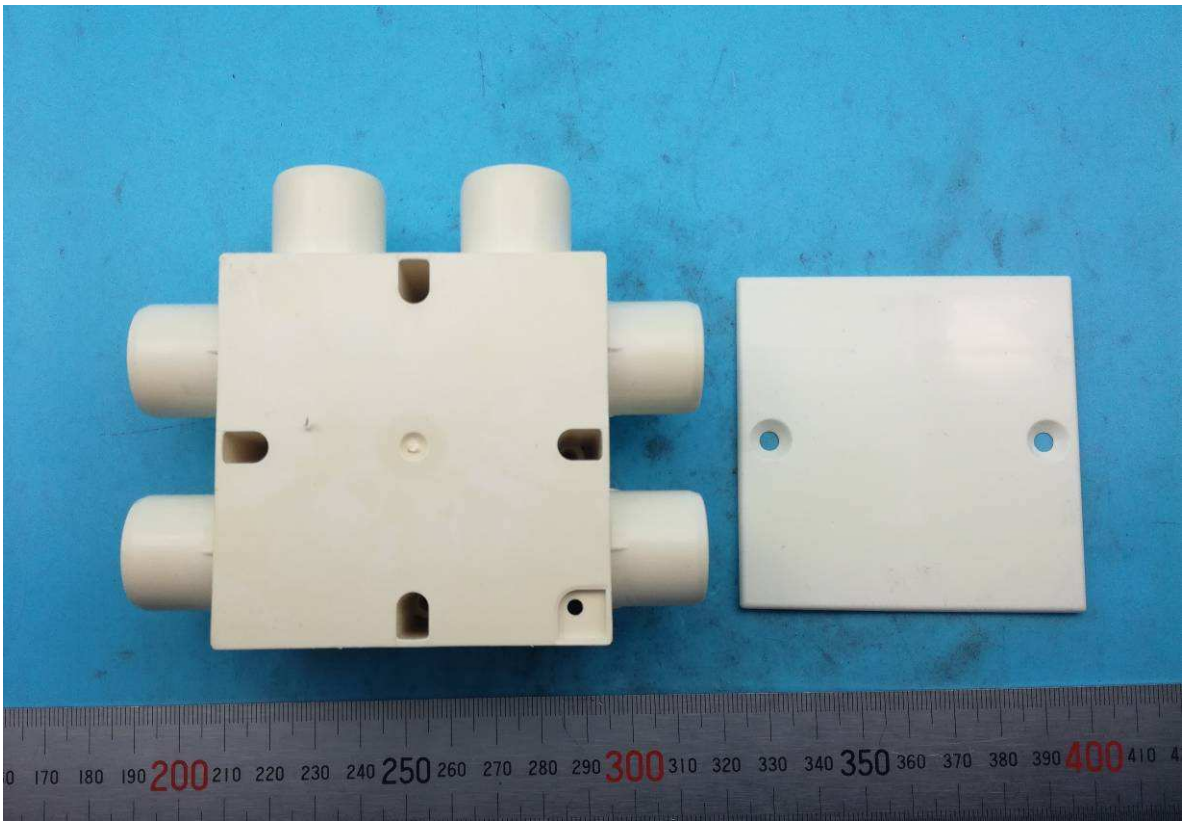
Plastic Enclosures (Covers & Boxes: SB 1-41 + SBL 1-S)

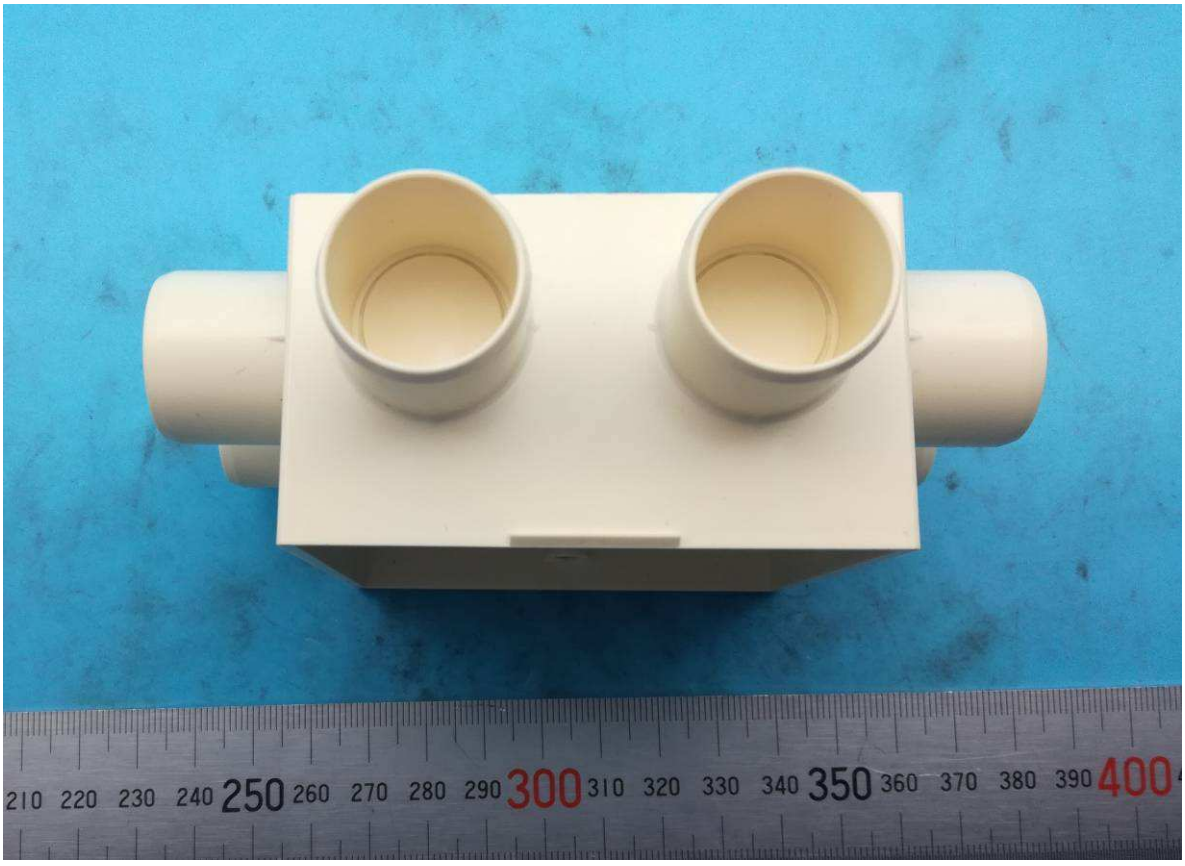




ANNEX 1
PHOTOGRAPHS

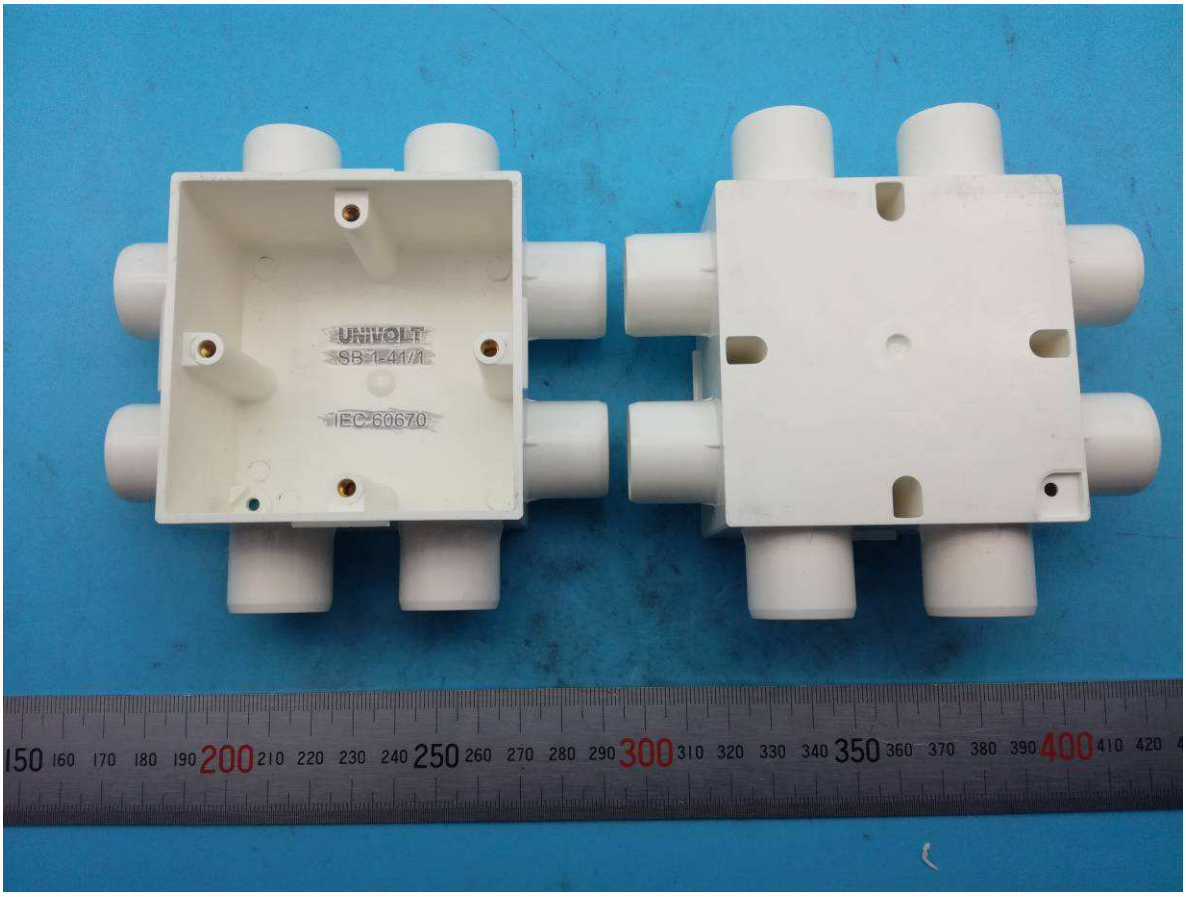
Plastic Enclosures (Covers & Boxes:SB 1-41 + SBL 1-S)

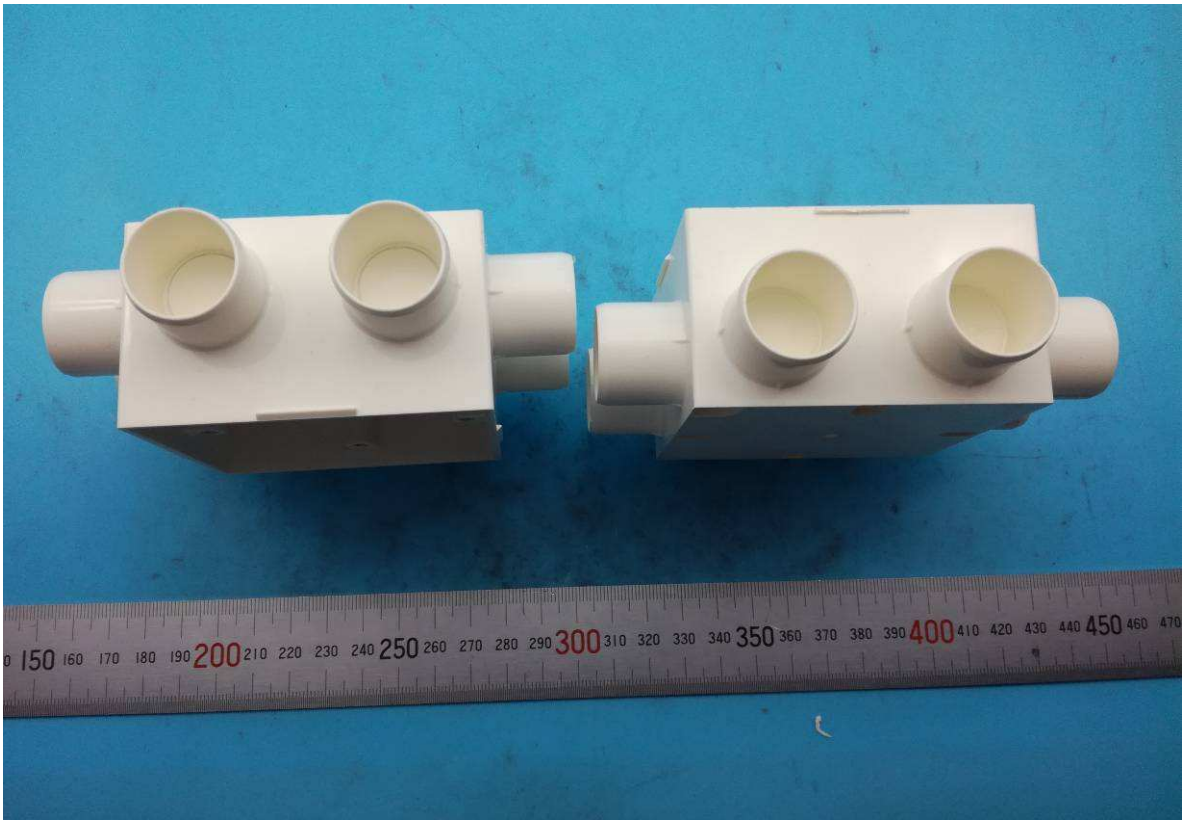




ANNEX 1
PHOTOGRAPHS

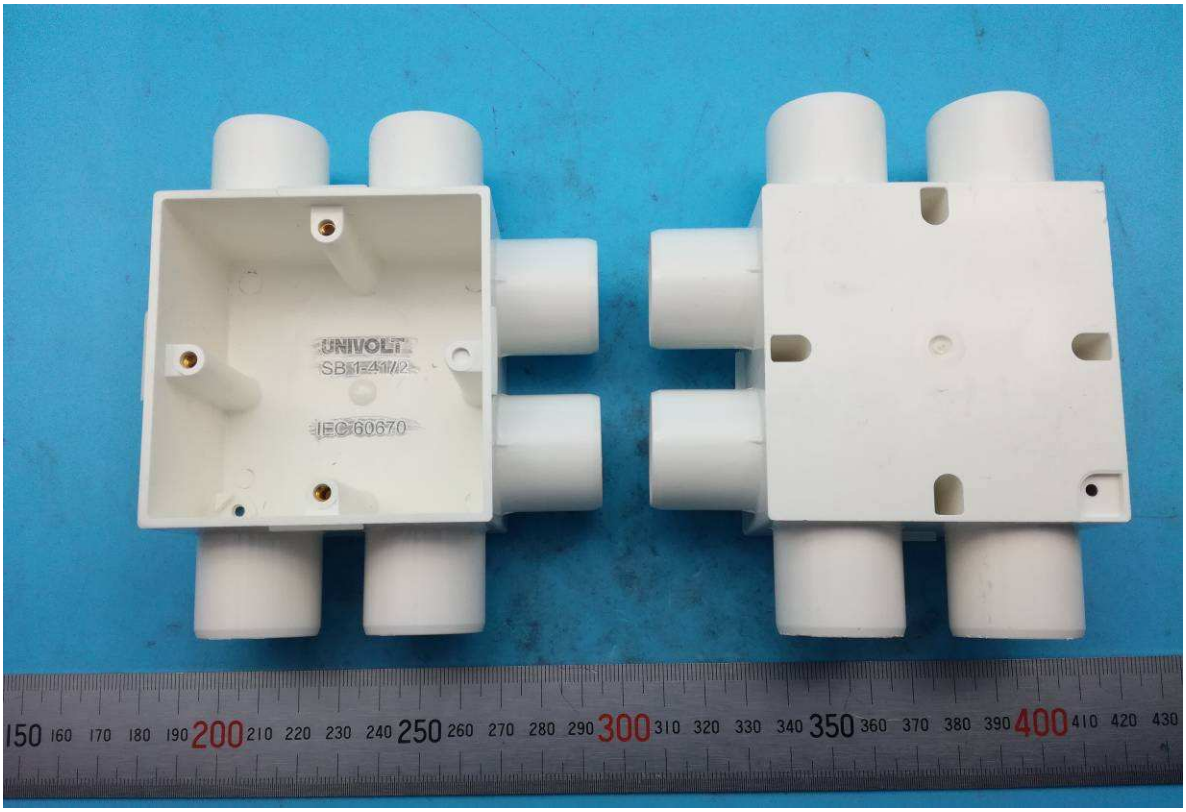
Plastic Enclosures (Boxes: SB 1-41/1)

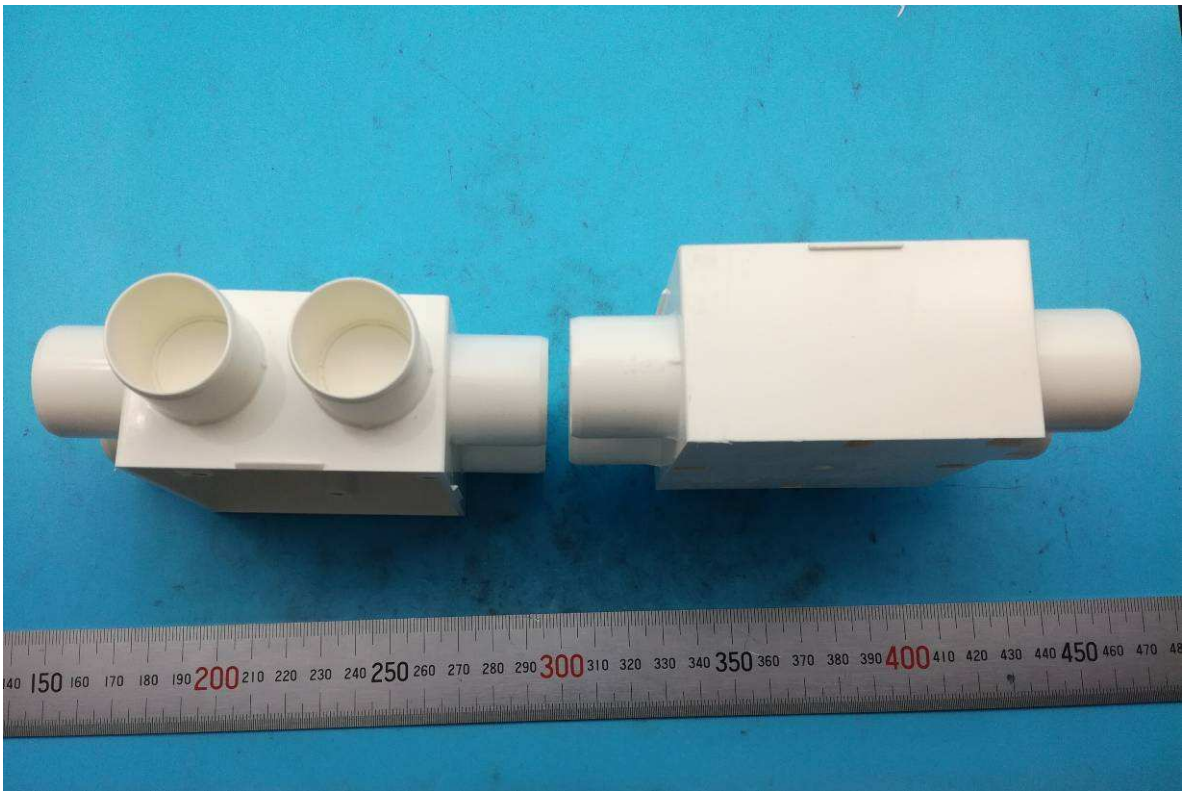




ANNEX 1
PHOTOGRAPHS

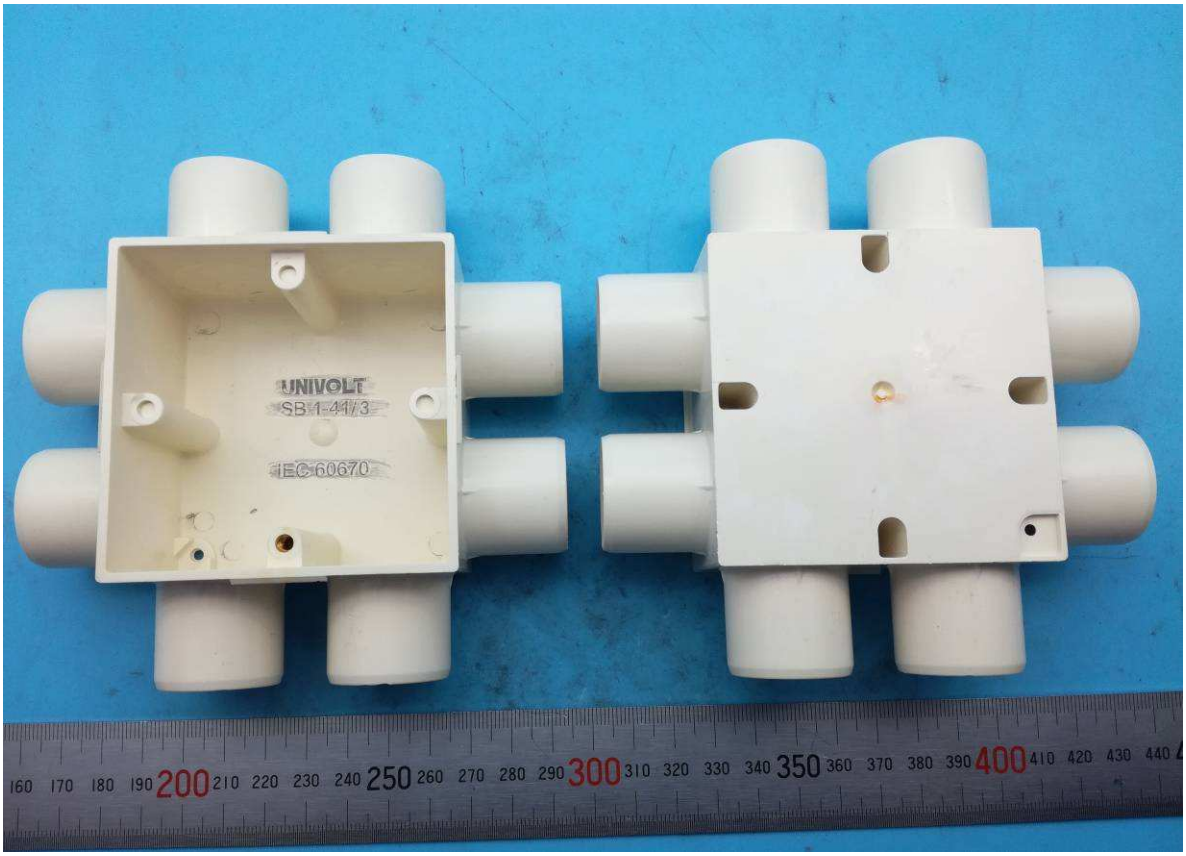
Plastic Enclosures (Boxes: SB 1-41/2)

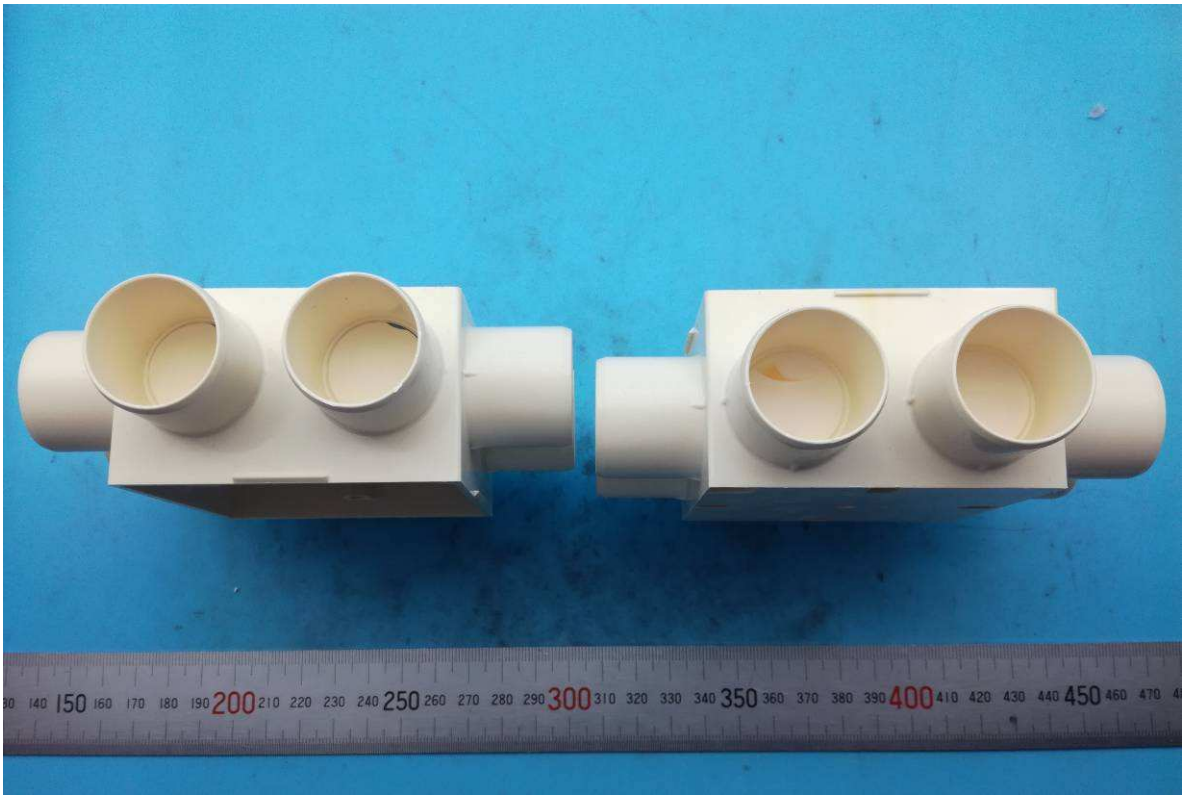




ANNEX 1
PHOTOGRAPHS

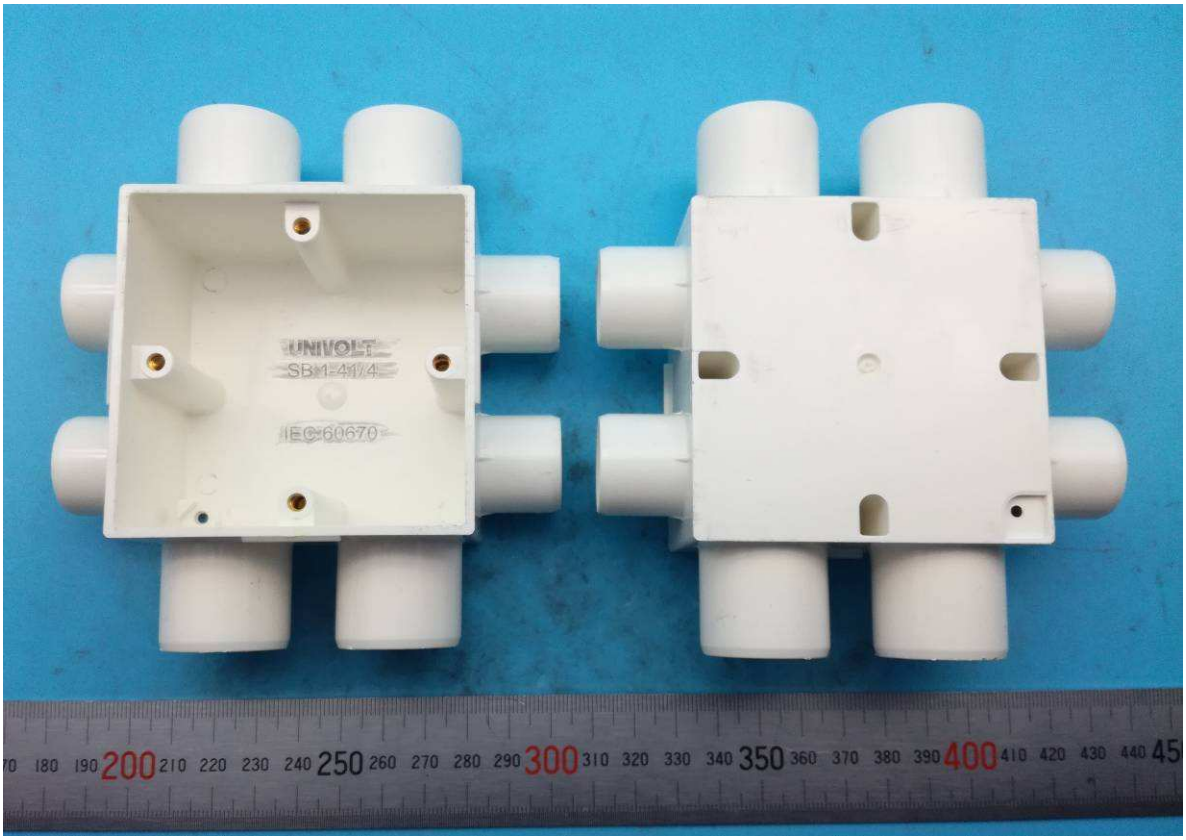
Plastic Enclosures (Boxes: SB 1-41/3)

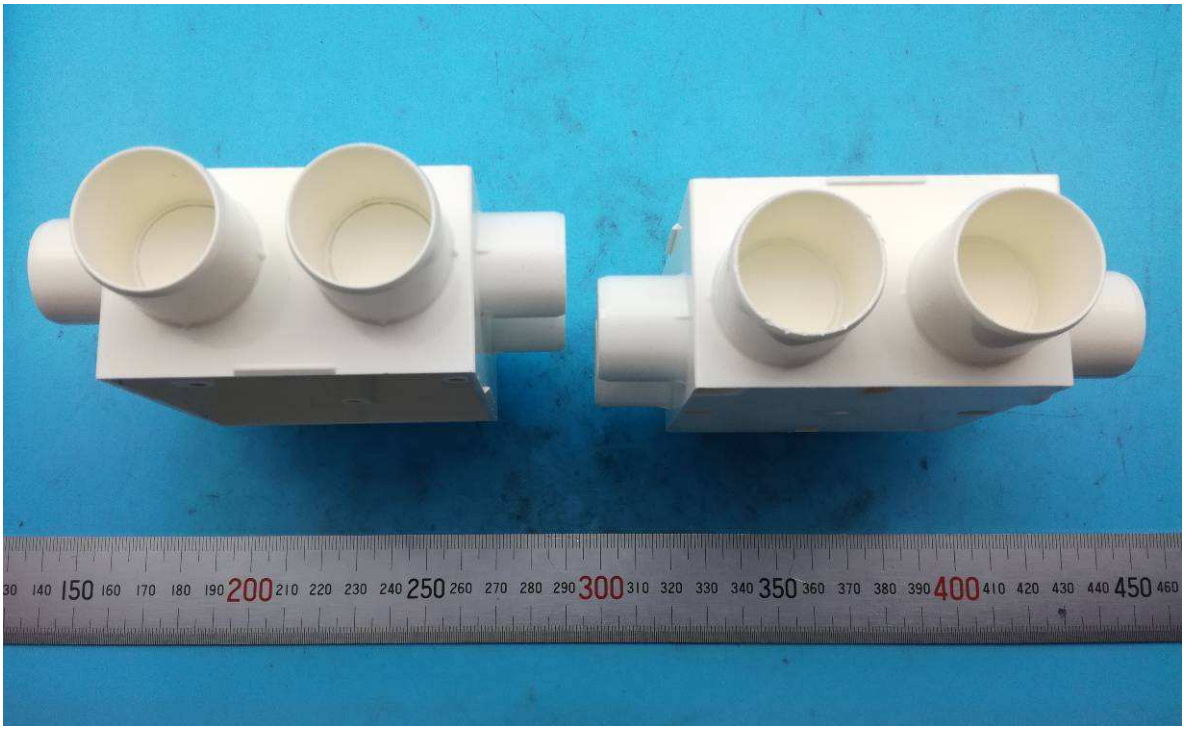




ANNEX 1
PHOTOGRAPHS

Plastic Enclosures (Boxes: SB 1-41/4)





ANNEX 1
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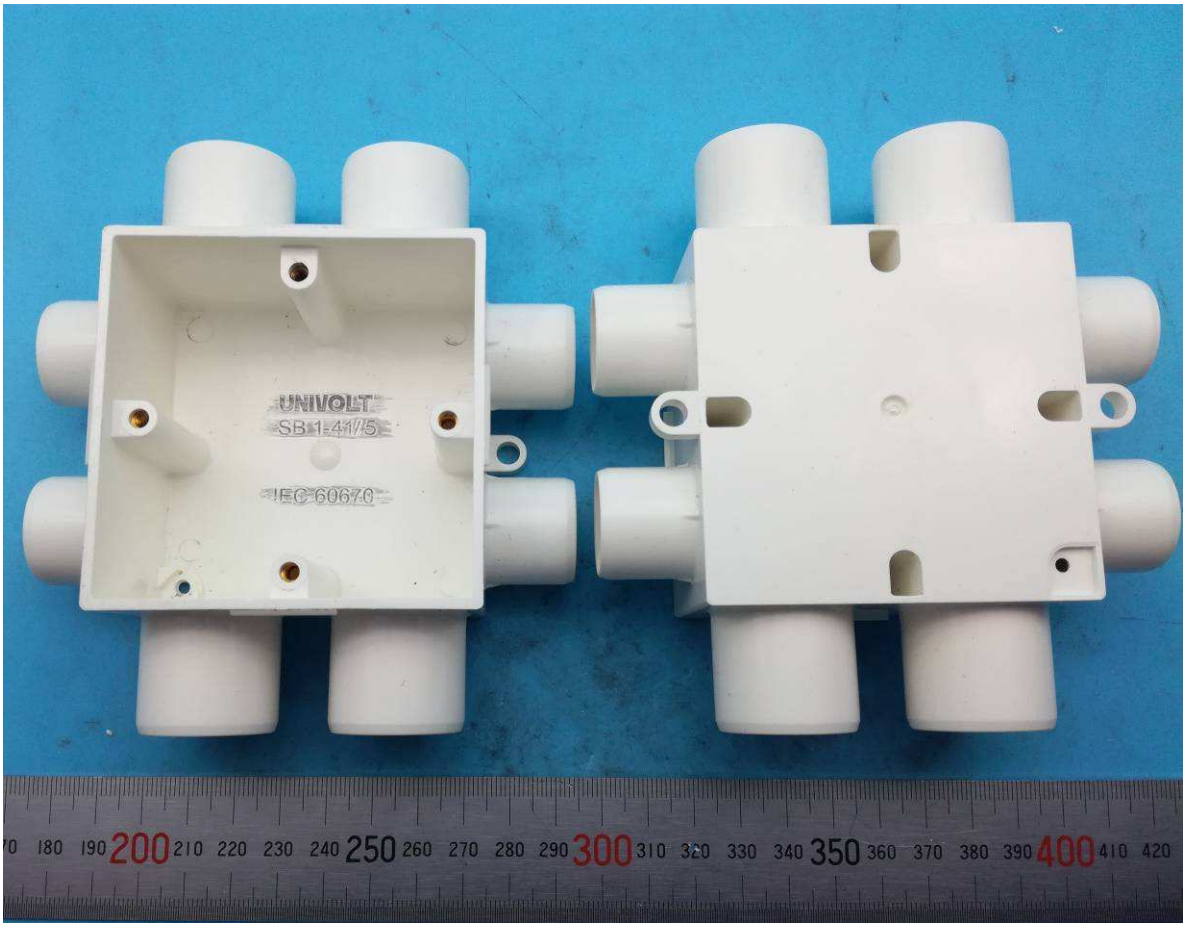
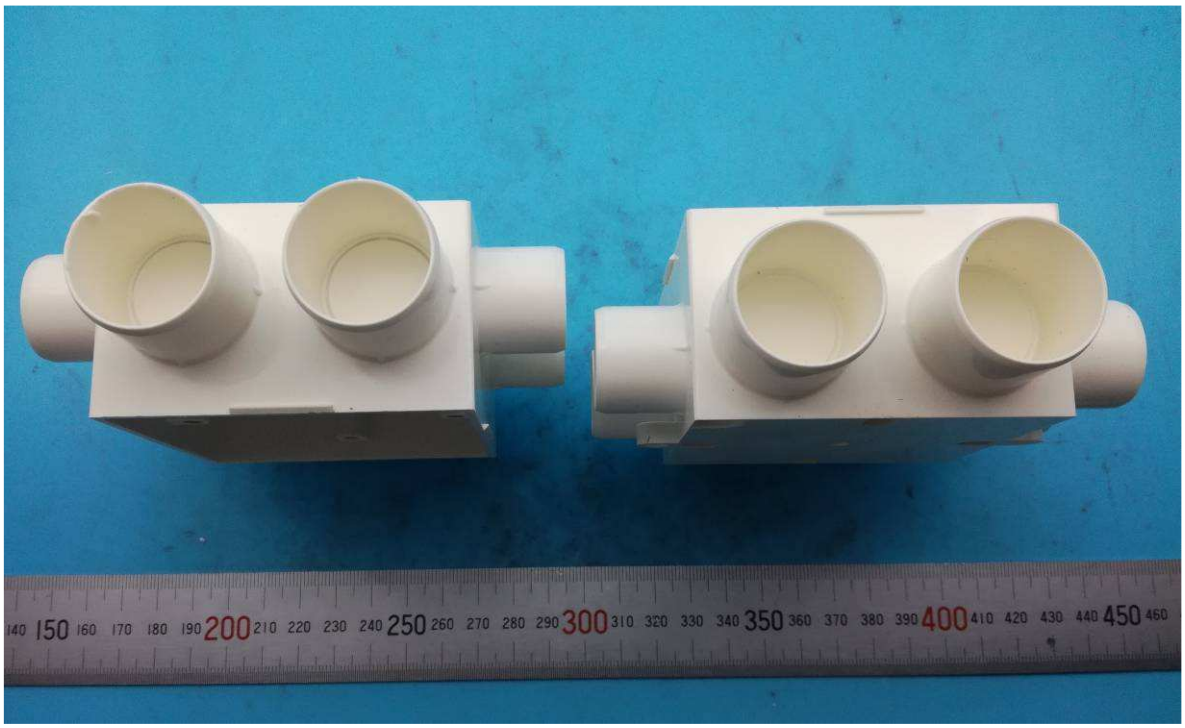
Plastic Enclosures (Boxes: SB 1-41/5)





ANNEX 1
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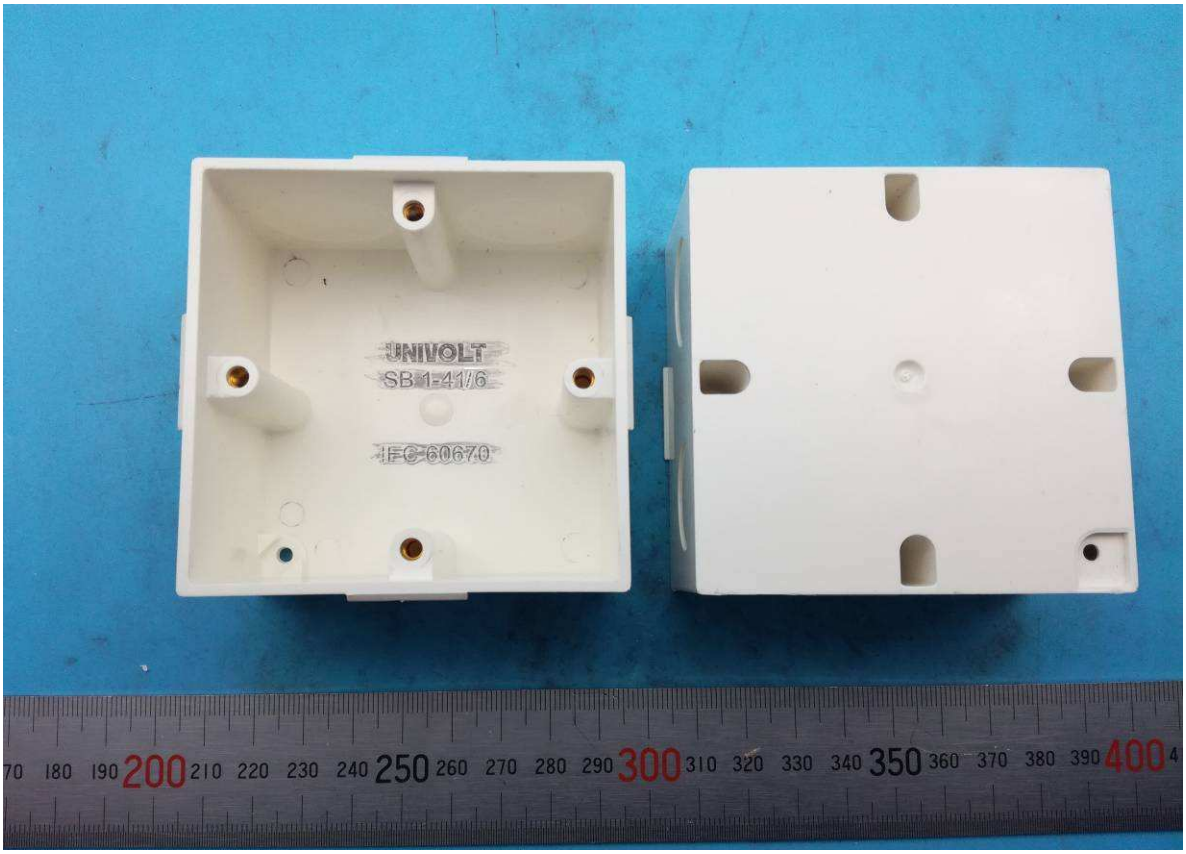
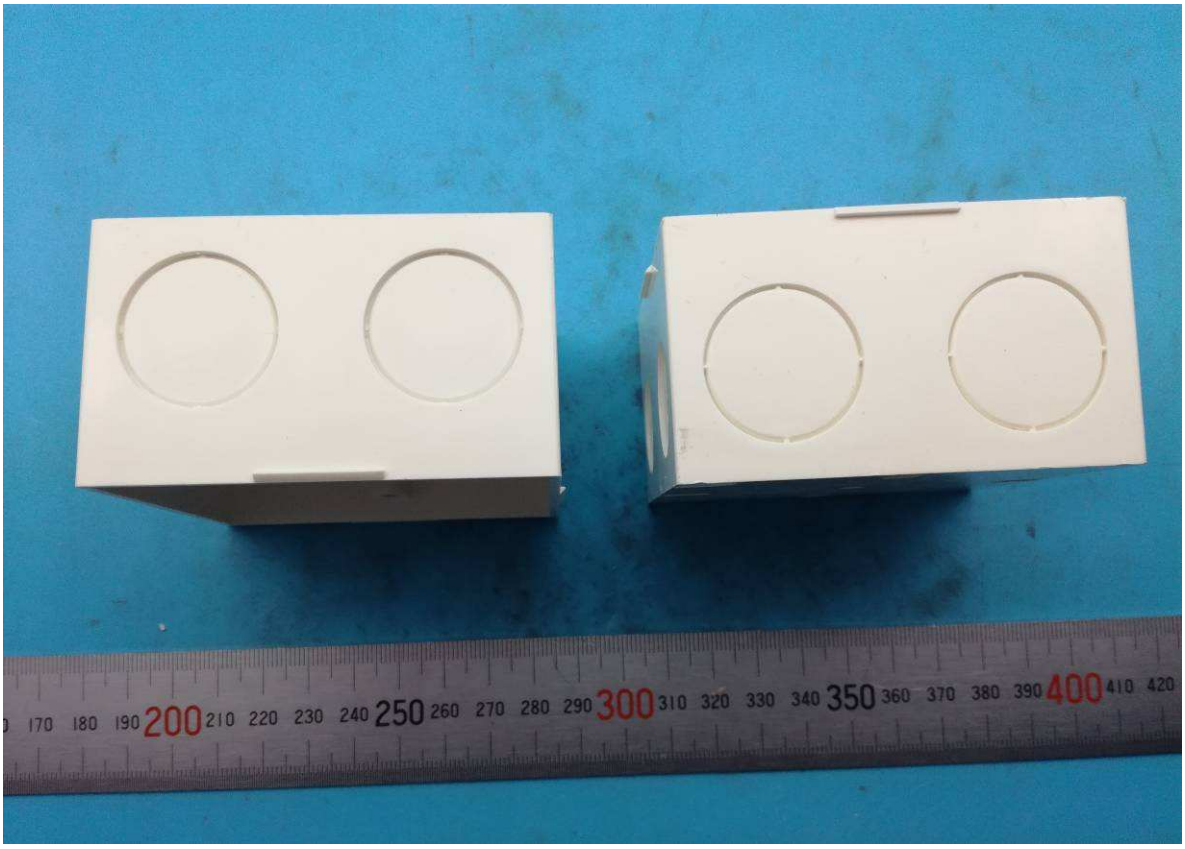
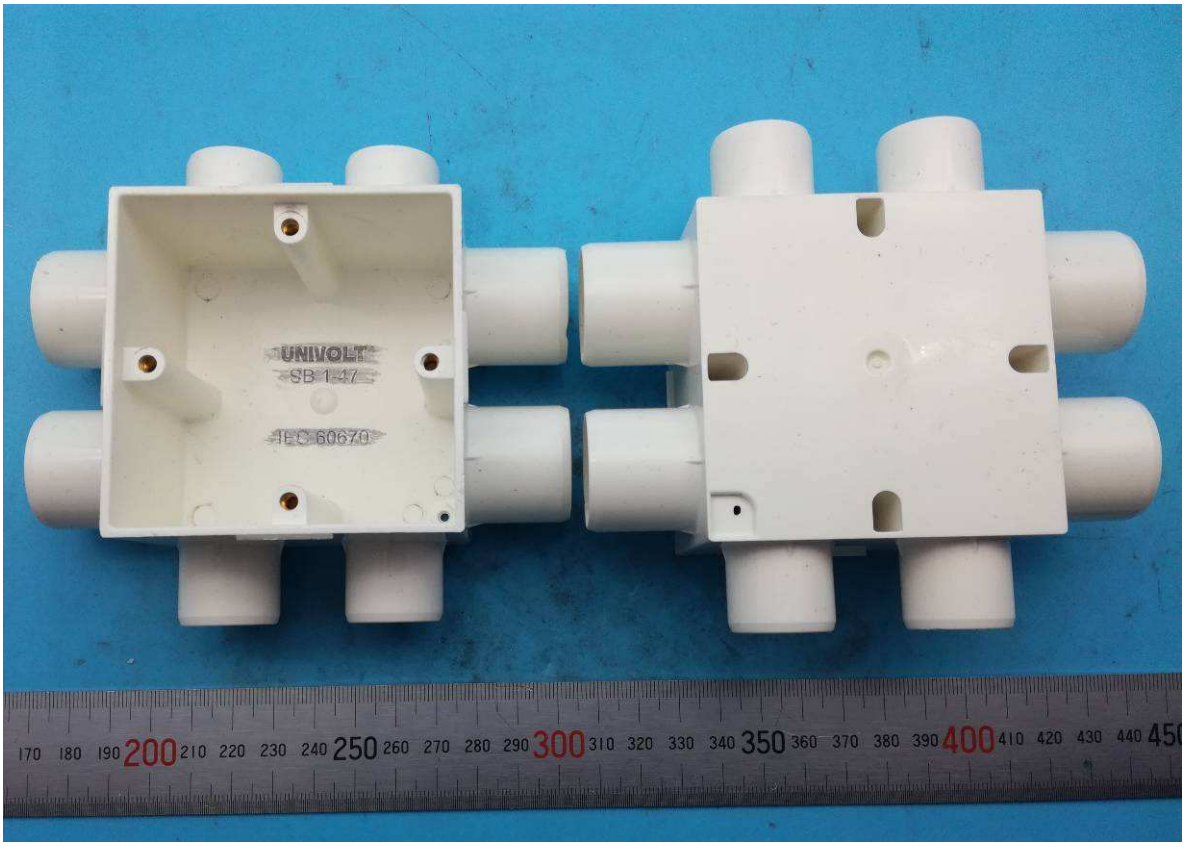
Plastic Enclosures (Boxes: SB 1-41/6)

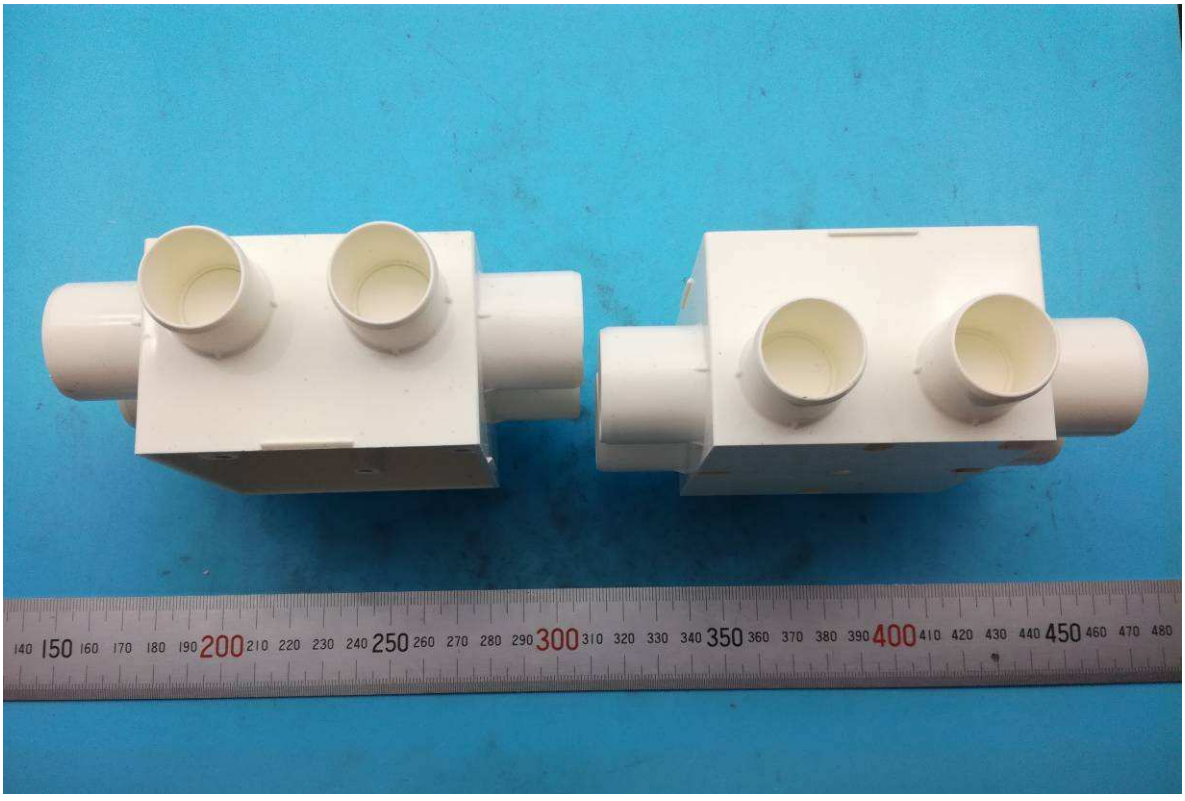




ANNEX 1
PHOTOGRAPHS

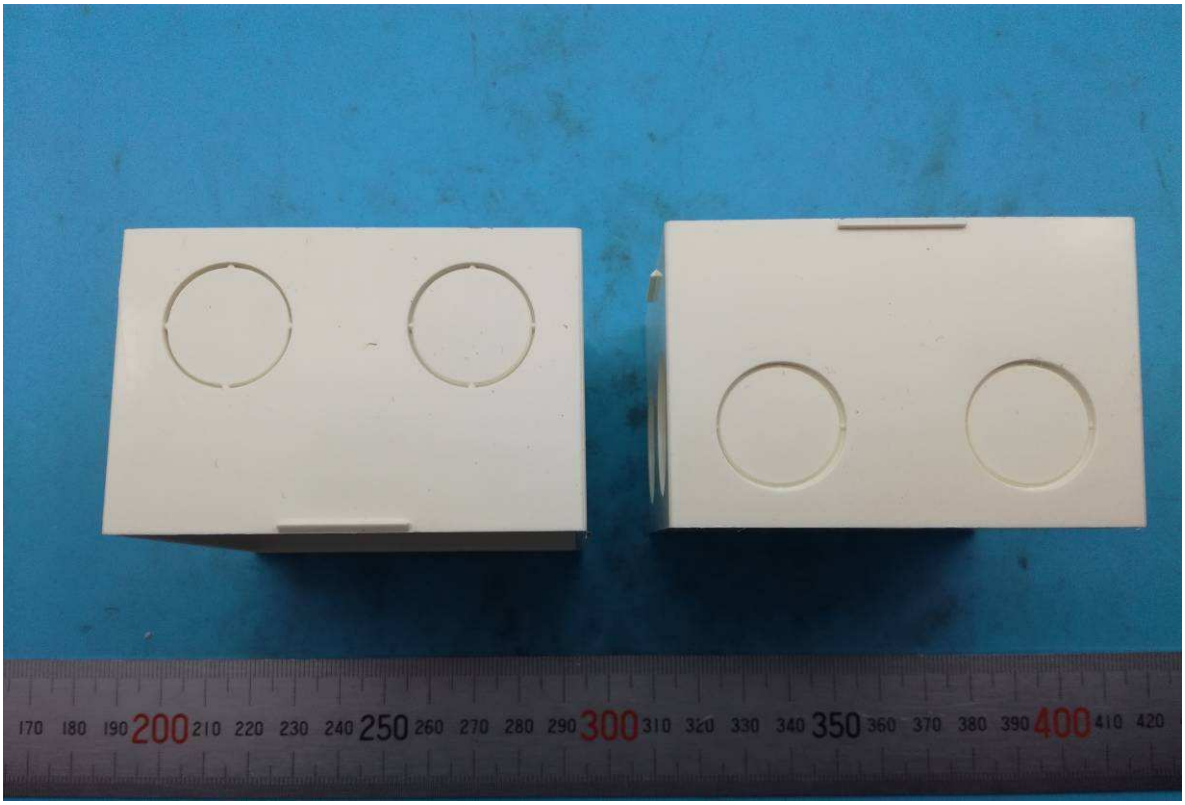
Plastic Enclosures (Boxes: SB 1-47)



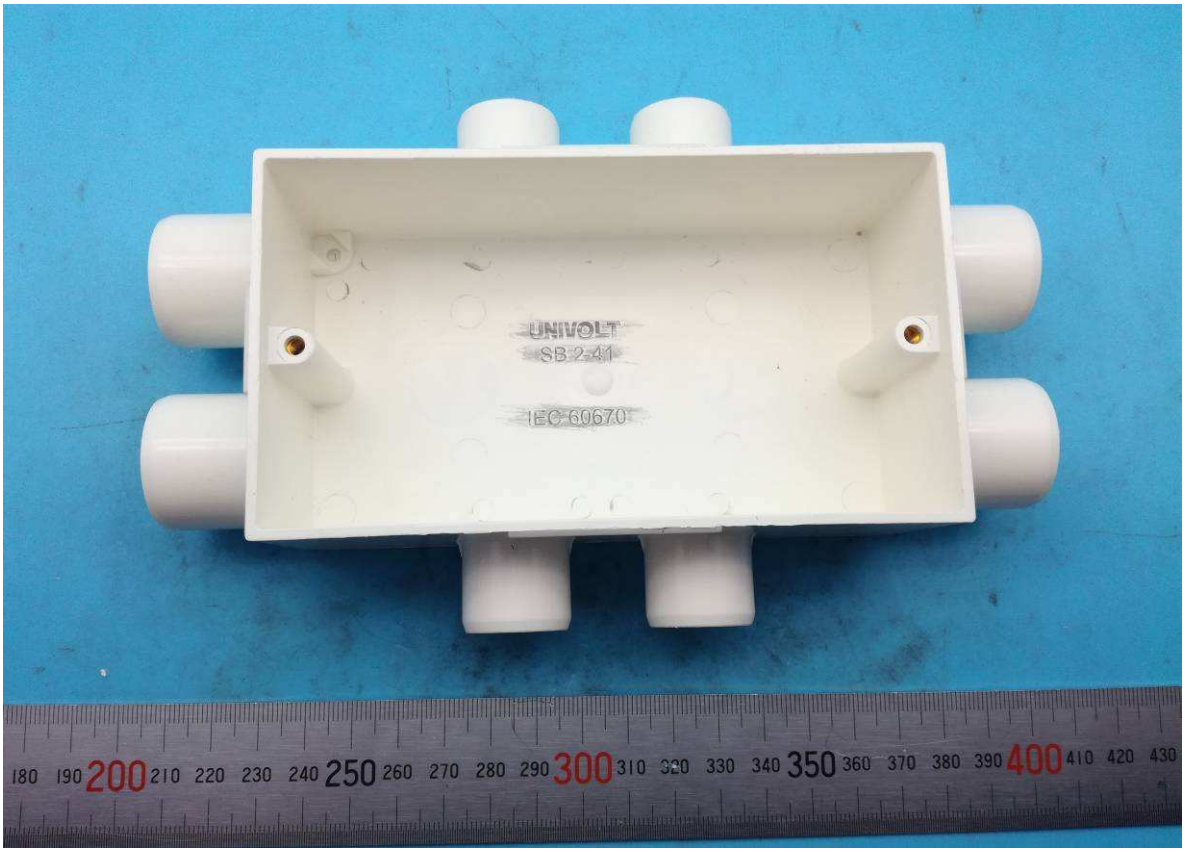


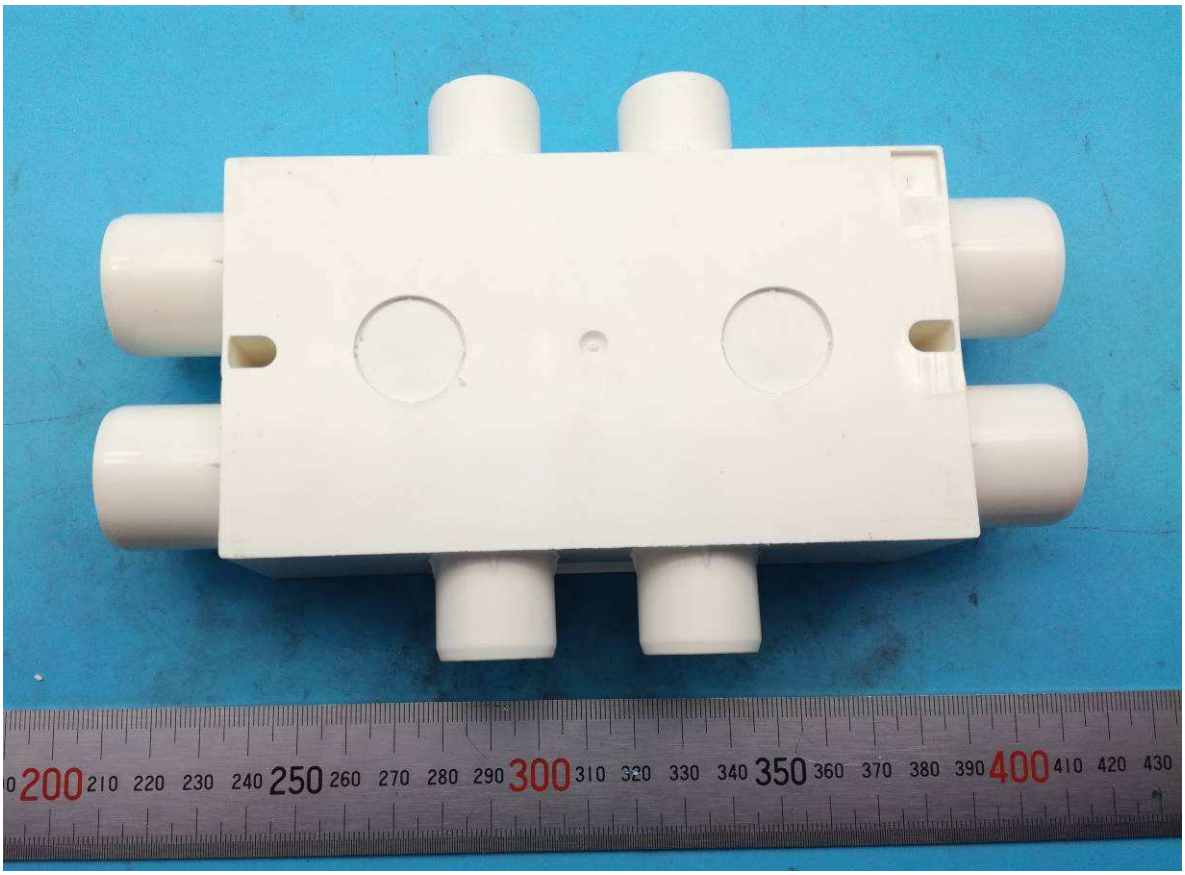
ANNEX 1
PHOTOGRAPHS

Plastic Enclosures (Boxes: SB 1-47/1)



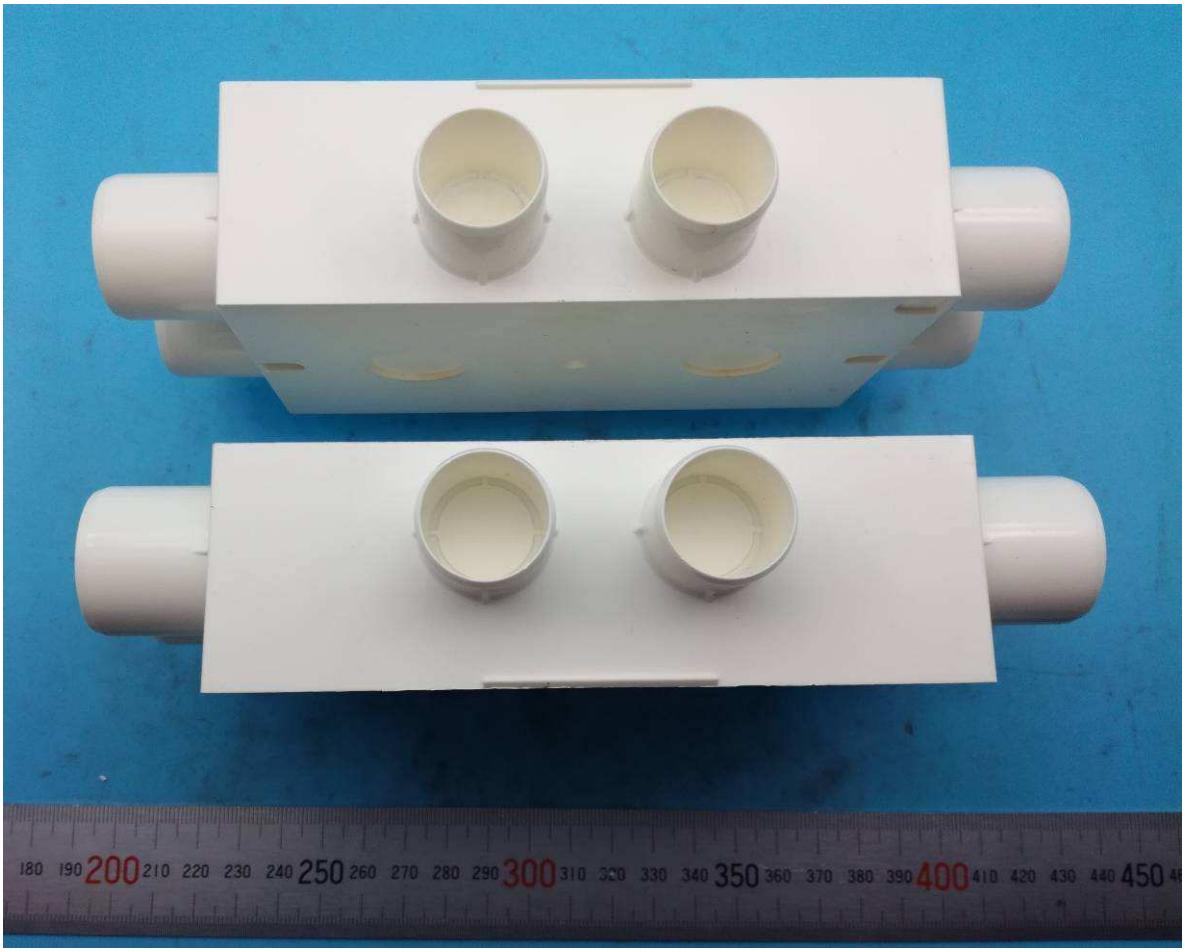
ANNEX 1
PHOTOGRAPHS
Plastic Enclosures (Boxes: SB 2-41)



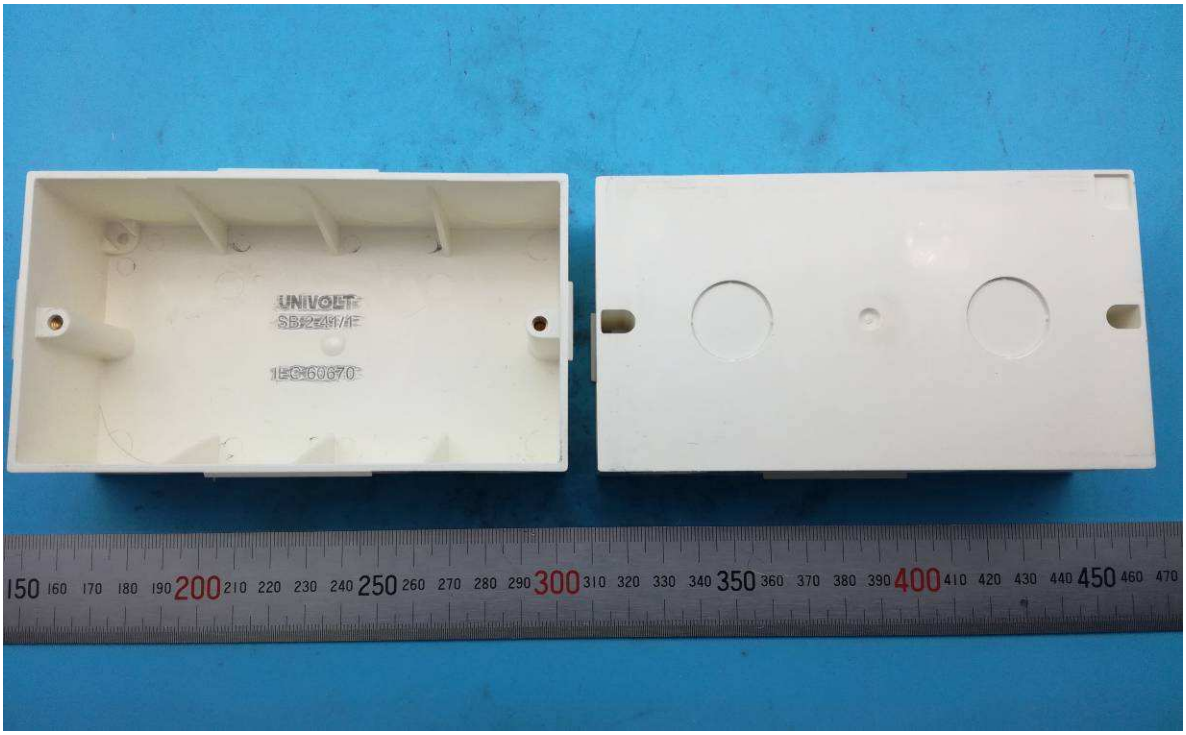


ANNEX 1
PHOTOGRAPHS

Plastic Enclosures (Boxes: SB 2-41)



Plastic Enclosures (Boxes: SB 2-41/1)



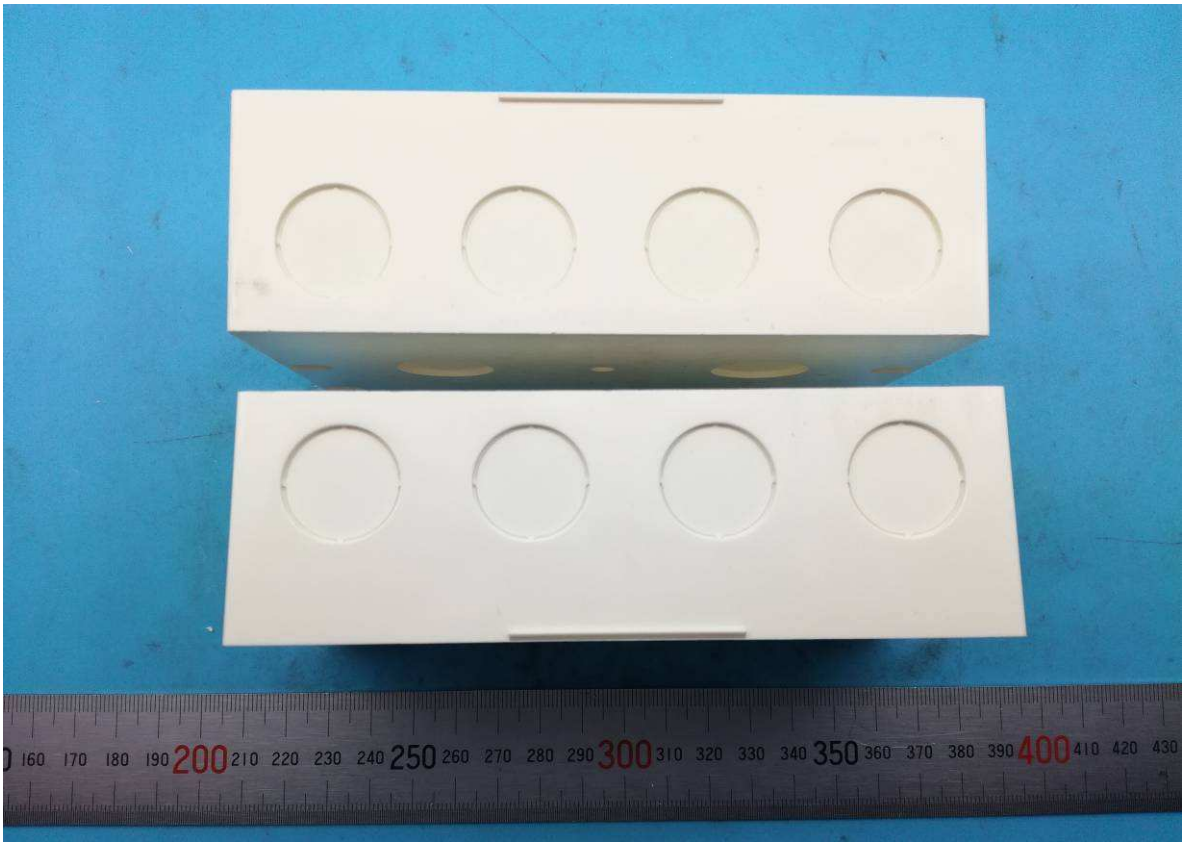
ANNEX 1
PHOTOGRAPHS

Plastic Enclosures (Boxes: SB 2-41/1)

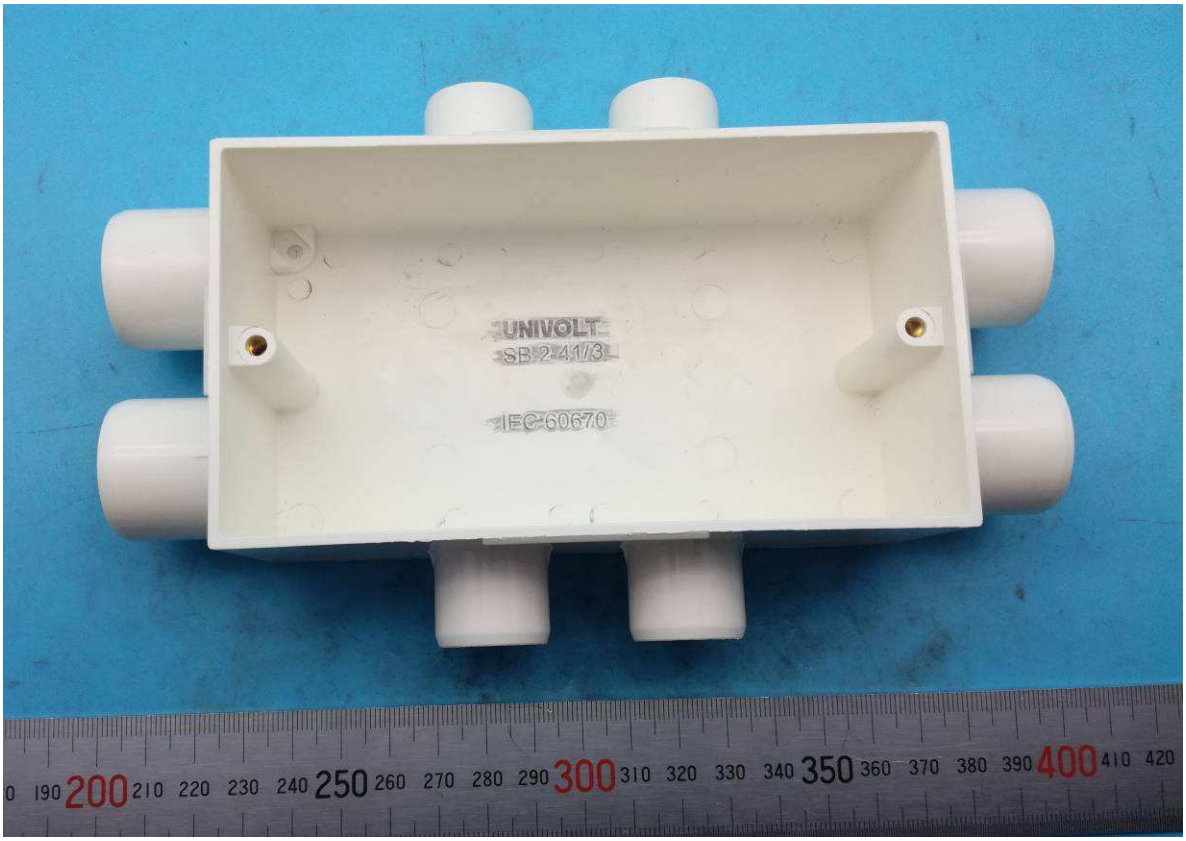
Plastic Enclosures (Boxes: SB 2-41/2)

ANNEX 1
PHOTOGRAPHS

Plastic Enclosures (Boxes: SB 2-41/2)

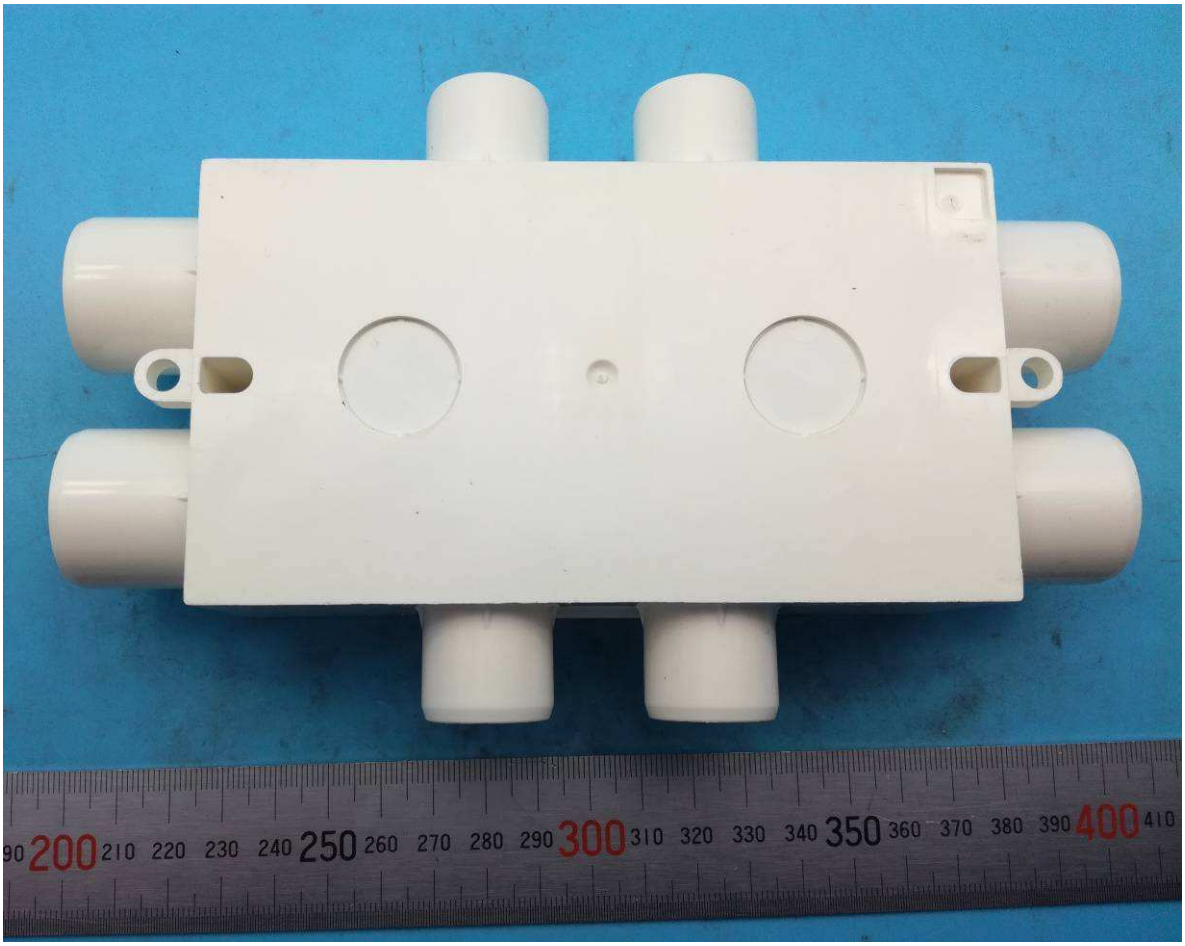


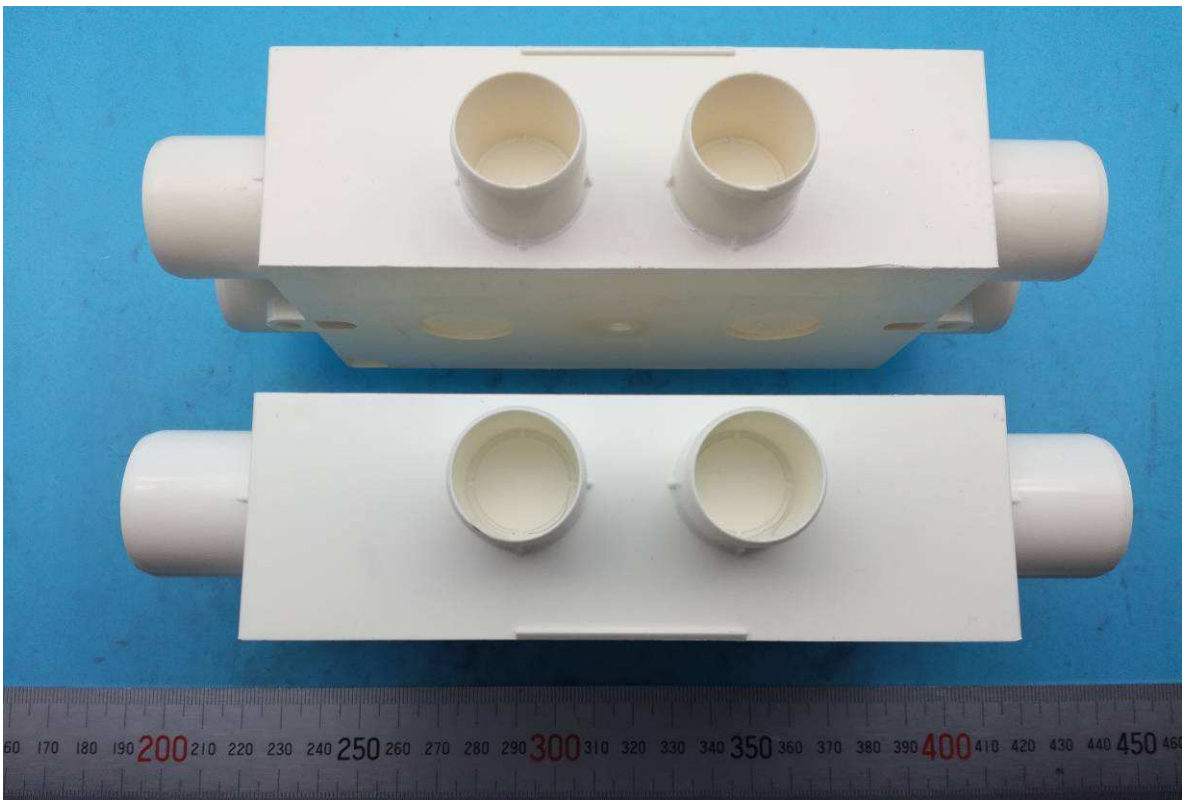
Plastic Enclosures (Boxes: SB 2-41/3)



ANNEX 1
PHOTOGRAPHS

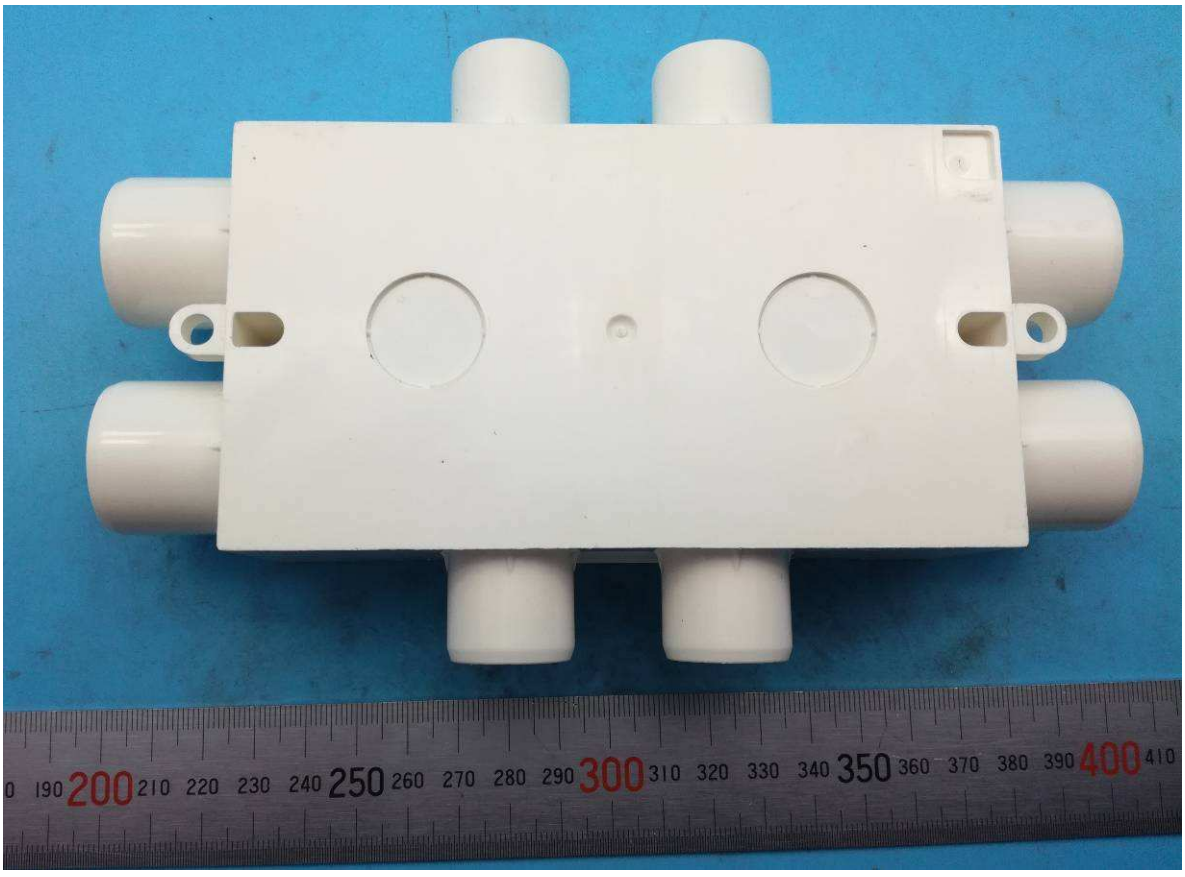
Plastic Enclosures (Boxes: SB 2-41/3)





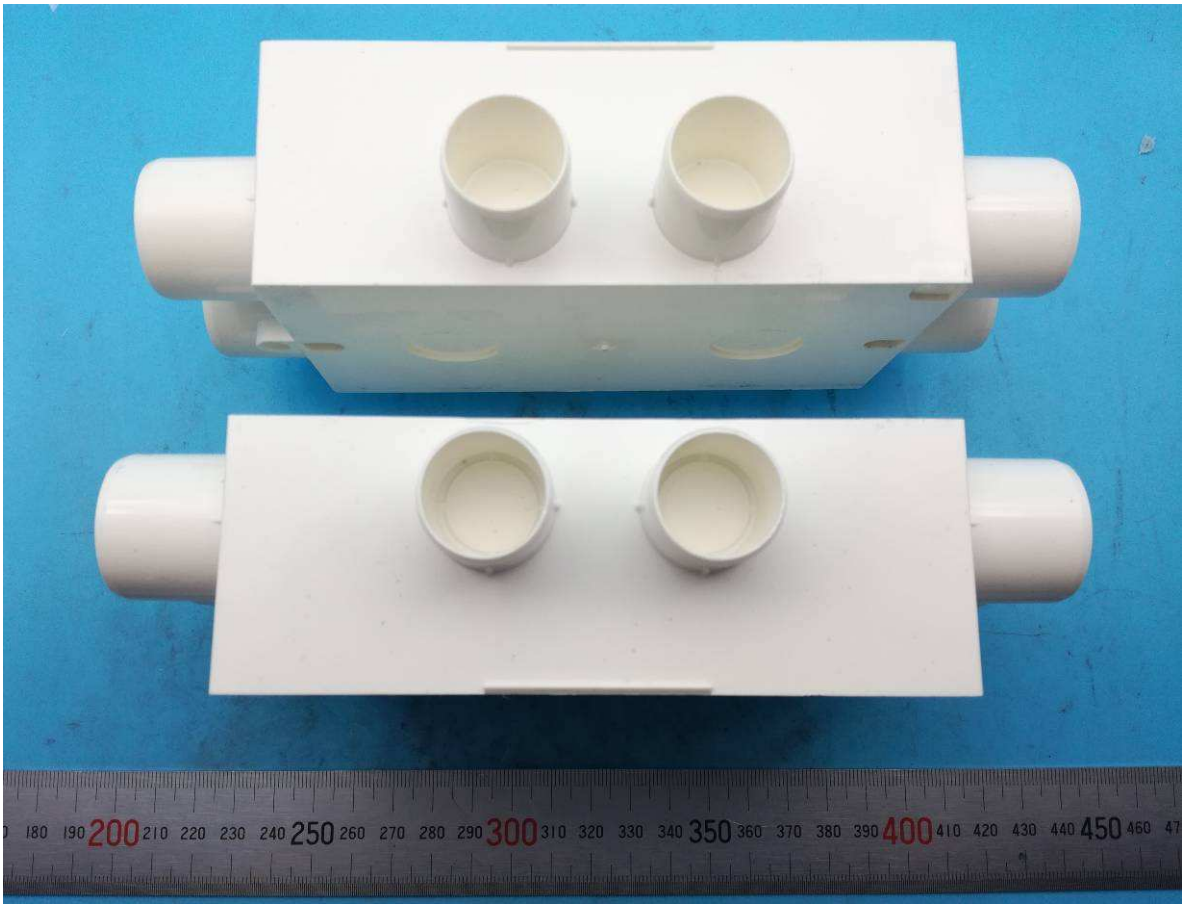
ANNEX 1
PHOTOGRAPHS

Plastic Enclosures (Boxes: SB 2-47)



ANNEX 1
PHOTOGRAPHS

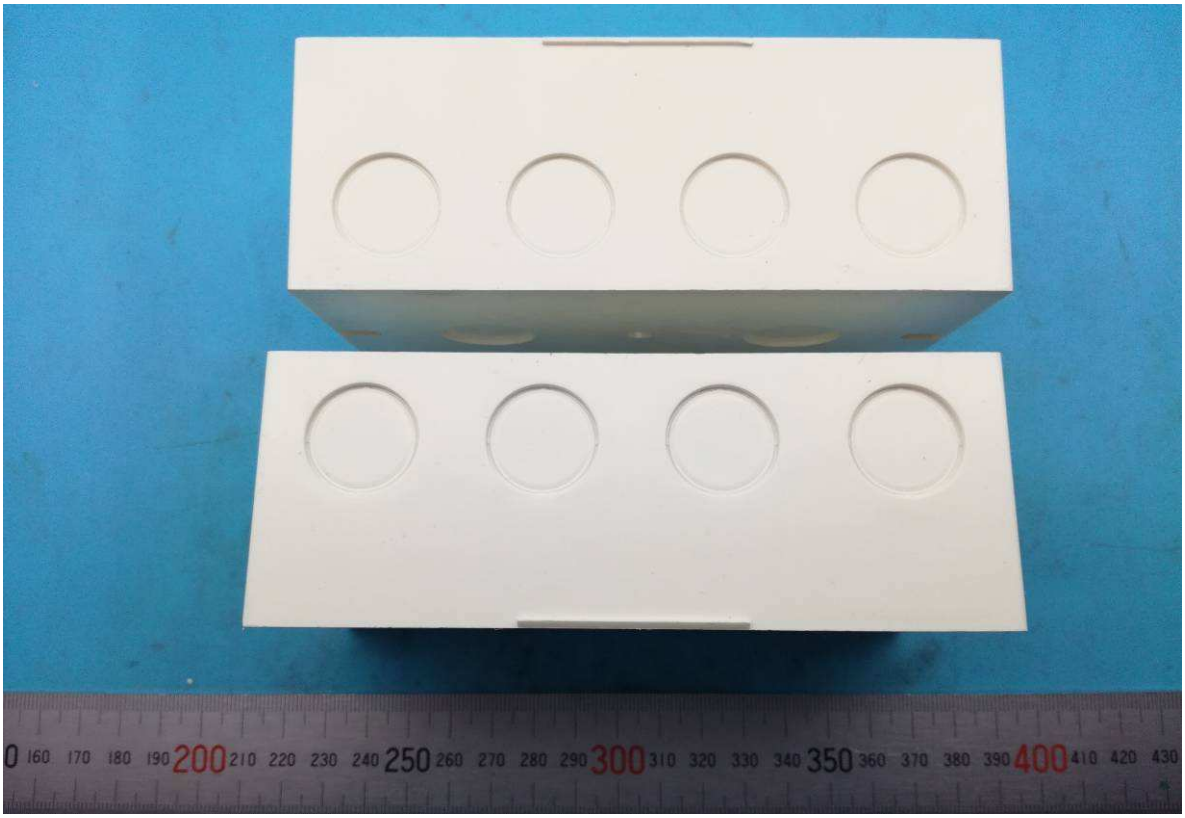
Plastic Enclosures (Boxes: SB 2-47)



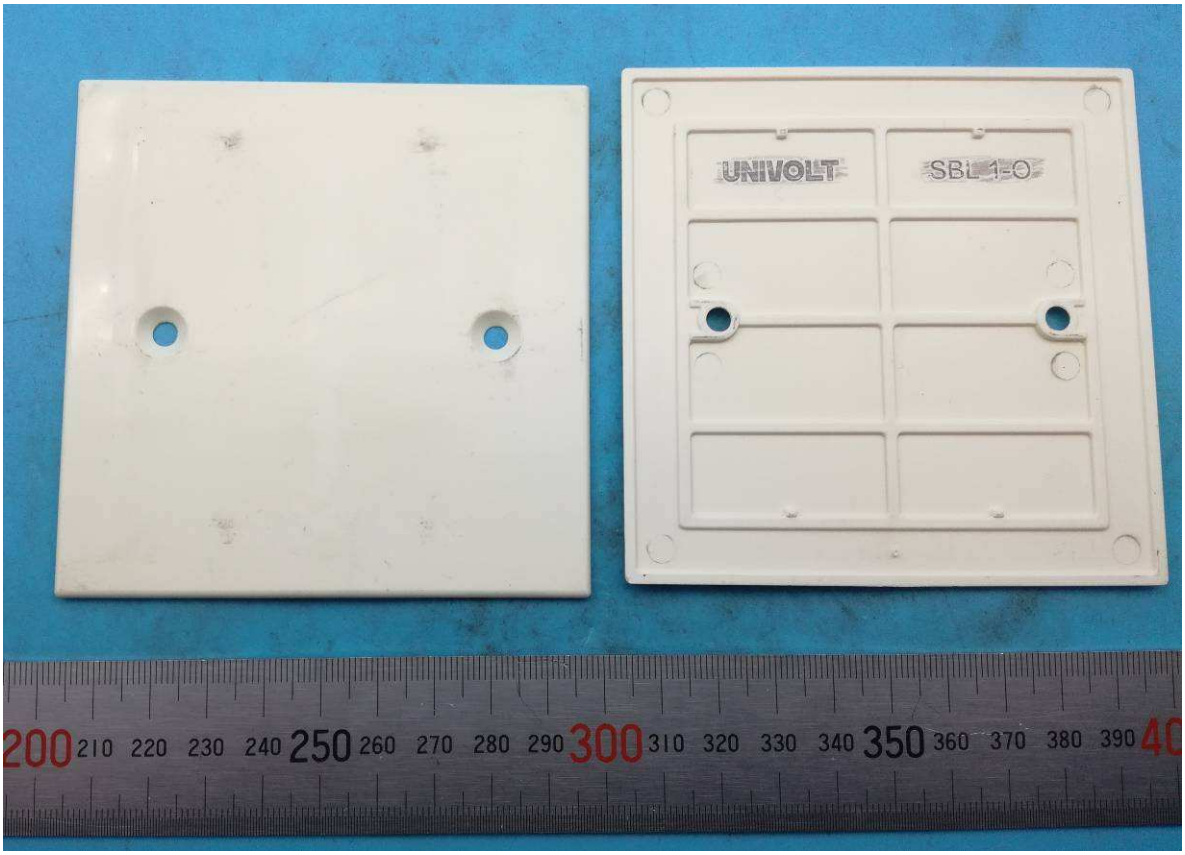
Plastic Enclosures (Boxes: SB 2-47/1)

ANNEX 1
PHOTOGRAPHS

Plastic Enclosures (Boxes: SB 2-47/1)

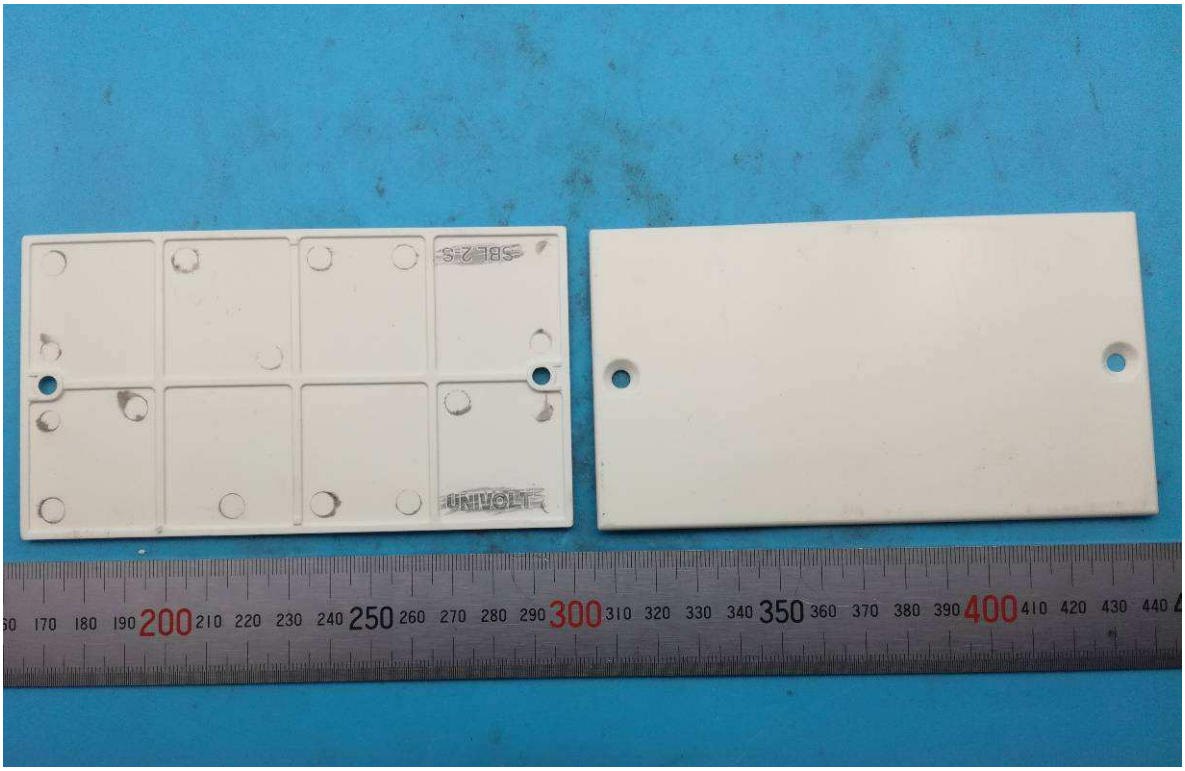


Plastic Enclosures (Cover: SBL 1-O)

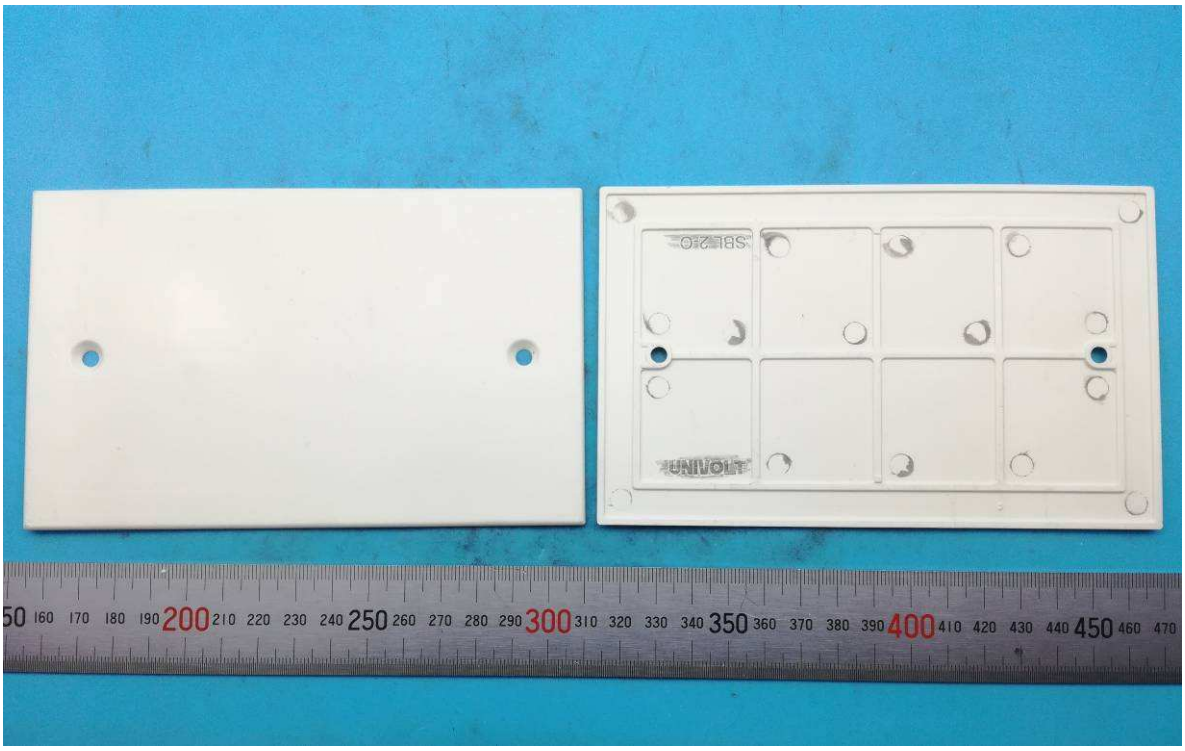


ANNEX 1
PHOTOGRAPHS

Plastic Enclosures (Cover: SBL 2-S)



Plastic Enclosures (Cover: SBL 2-O)



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Important

1. The test report is invalid without the official stamp of CVC;
2. Any photocopies or part photocopies of the test report are forbidden without the written permission from CVC;
3. The test report is invalid without the signatures of Approval and Reviewer;
4. The test report is invalid if altered;
5. Objections to the test report must be submitted to CVC within 15 days;
6. Generally, commission test is responsible for the tested samples only;
7. “P” means “pass” , “F” means “fail”, “N/A” means “not applicable” and “ / ”means “not test”.

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