

**Technical Report No:  
S-1318-3194-00 MO**

<i>Client</i>	TBLOC Elektrik Elektronik San.ve Tic. A.S.
<i>Manufacturing Location</i>	29 Ekim Mah. 10001 Sok. No:50/4 , 35663 Menemen Izmir - Turkiye
<i>Test Sample Models/Versions</i>	TERMINAL BLOCKS / TBL 2.5 - PFT 2.5 – PFT 2.5 2P – TBL 4 – PFT 4 – TBL 6 - PFT 6 – TBL 10 – PFT 10
<i>Testing Location</i>	emitel TR Ltd. Şti MTK Sitesi 5746/13 Sokak No:12 Çamdibi / Bornova / İzmir / Türkiye
<i>Test Standard</i>	ISO 16750-4:2010 referred to IEC/EN 60068-2-1:2007 ( Environmental Testing: Part 2.1 Tests – Test A: Cold )
<i>Purpose of Testing</i>	Compliance with the requested clauses of the related standards
<i>Date of Receipt of Test Item</i>	29.09.2023
<i>Date(s) of Performance of Tests</i>	16.10.2023 - 23.10.2023
<i>Results</i>	After 96 hours in a cold test chamber at - 65°C , visual, dimensional and constructional inspections have been performed on specimen and no degradations were observed.  Resistance values between the conductors of the terminal blocks have been measured before & after the cold test, and recorded for information purpose only.
<i>Date of Issue</i>	08.11.2023

*This technical report can only be quoted as the whole part. It must be certified officially for all advertising purposes. This report is the result of only the tested sample and not a general assessment for the serial manufacturing products.*

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## 1. Identification of the Test Sample

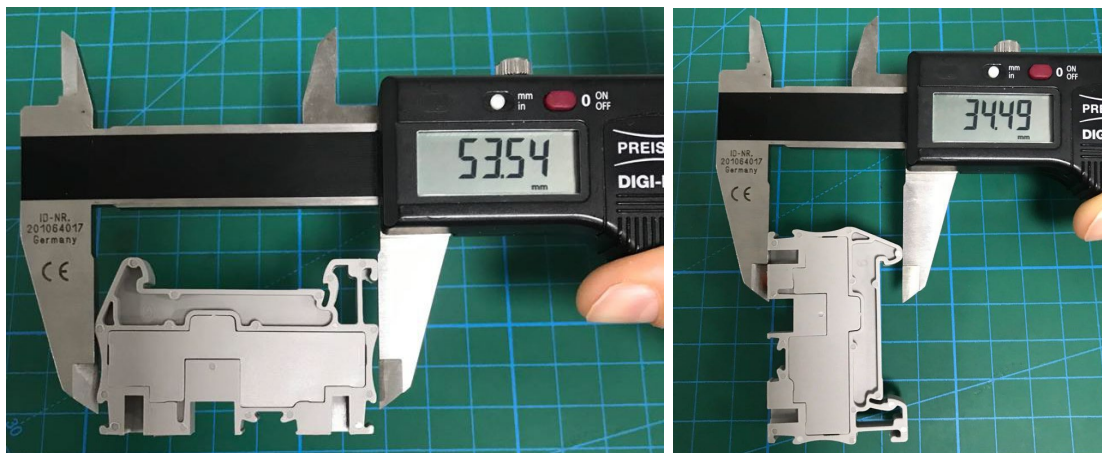
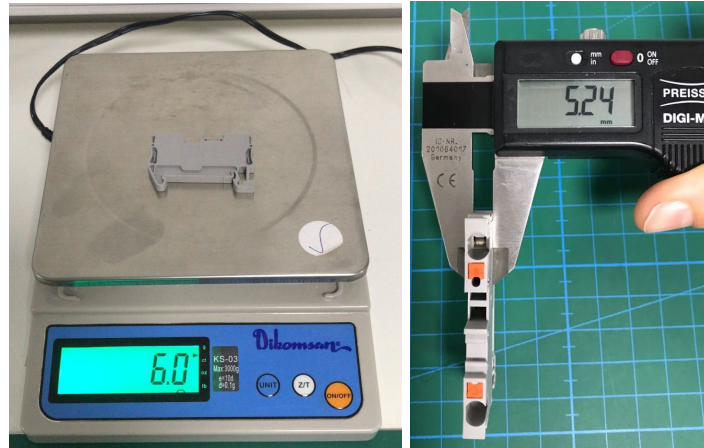
### 1.1. Function

The samples are terminal blocks used to connect electrical transmission cables that have been divided into two or more parts.

### 1.2. Technical Information

**Table 1.2.1: Sample Components (PFT 2.5)**

<i>Product Description:</i>	Push-in Terminal Blocks/Feed Through Terminal Blocks
<i>Manufacture Part Nr:</i>	PFT 2.5
<i>Rated Values:</i>	800 V / 24 A
<i>Cross-Section:</i>	2.5 mm <sup>2</sup>
<i>Rated Impulse Voltage:</i>	8 kV
<i>Pollution Degree / Voltage Category / Material Group:</i>	3 / III / I
<i>Mass:</i>	6 g
<i>Dimensions (w-l-h):</i>	5.2 mm x 54 mm x 35.7 mm



**Photo 1.2.1: Pictures of the DUT (PFT 2,5)**

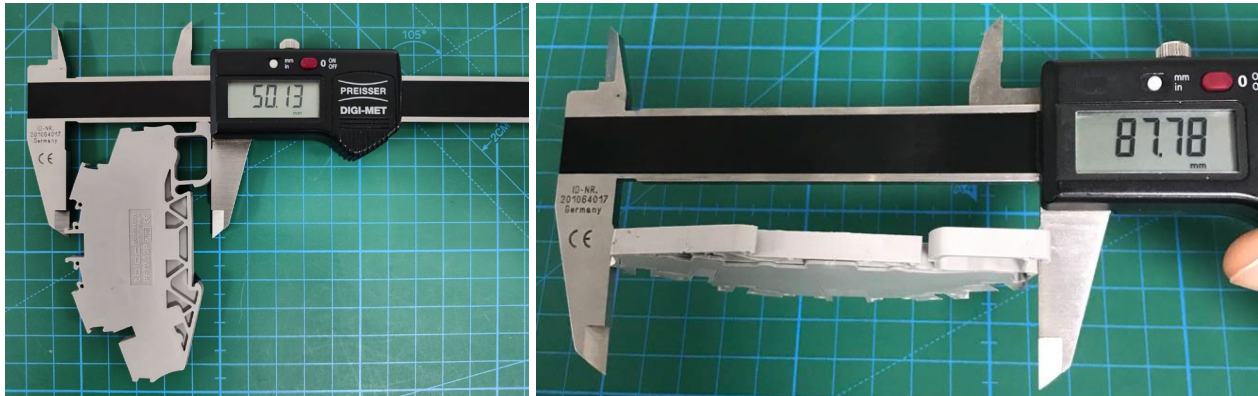
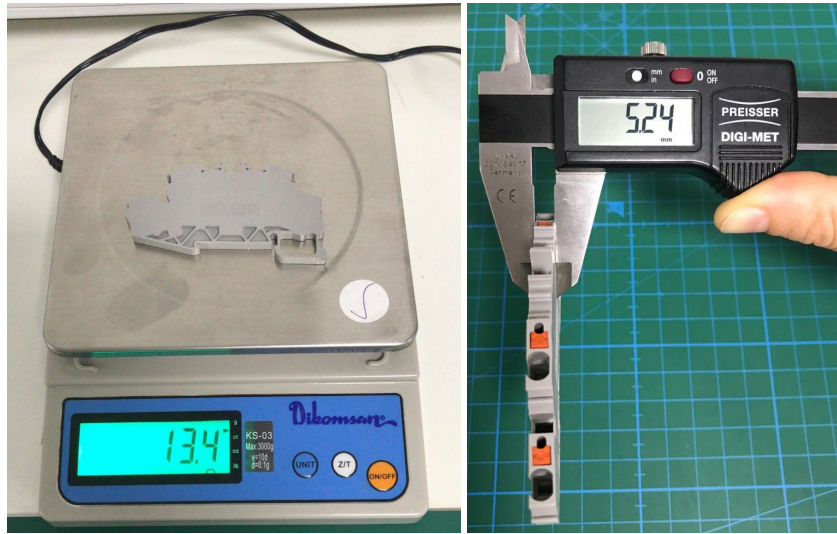
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**Table 1.2.2: Sample Components (PFT 2.5 2P)**

<i>Product Description:</i>	Push-in Terminal Blocks/ Multi - Entry and Multi - Level Terminal Blocks
<i>Manufacture Part Nr:</i>	PFT 2.5 2P
<i>Rated Values:</i>	500 V / 24 A
<i>Cross-Section:</i>	2.5 mm <sup>2</sup>
<i>Rated Impulse Voltage:</i>	8 kV
<i>Pollution Degree / Voltage Category / Material Group:</i>	3 / III / I
<i>Mass:</i>	13.4 g
<i>Dimensions (w-l-h):</i>	5.2 mm x 88 mm x 50,2 mm



**Photo 1.2.2: Pictures of the DUT (PFT 2,5 2P)**

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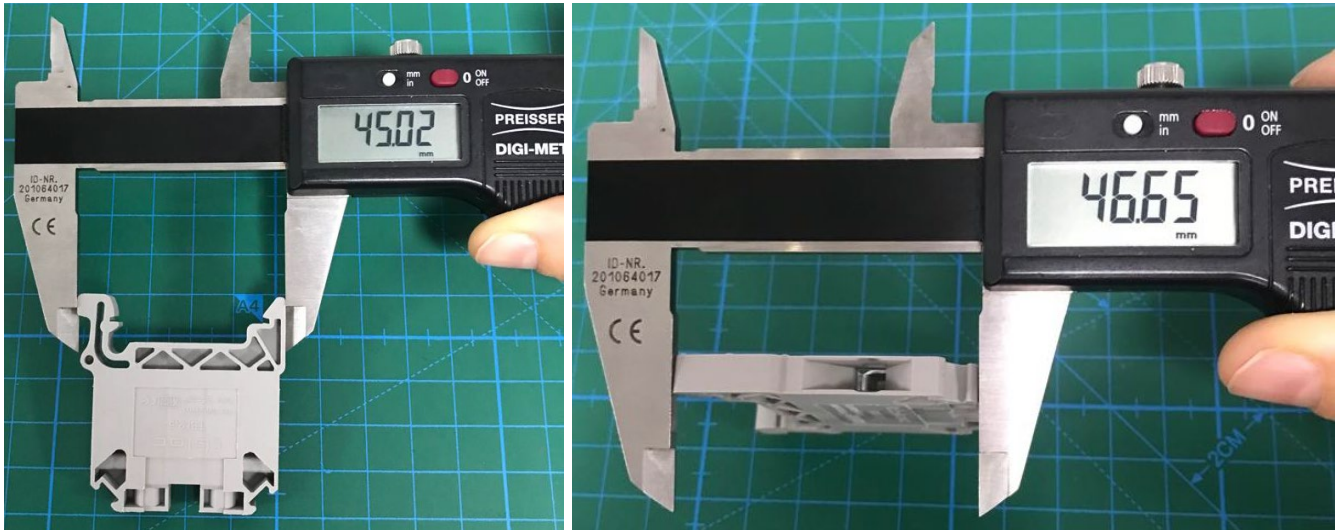
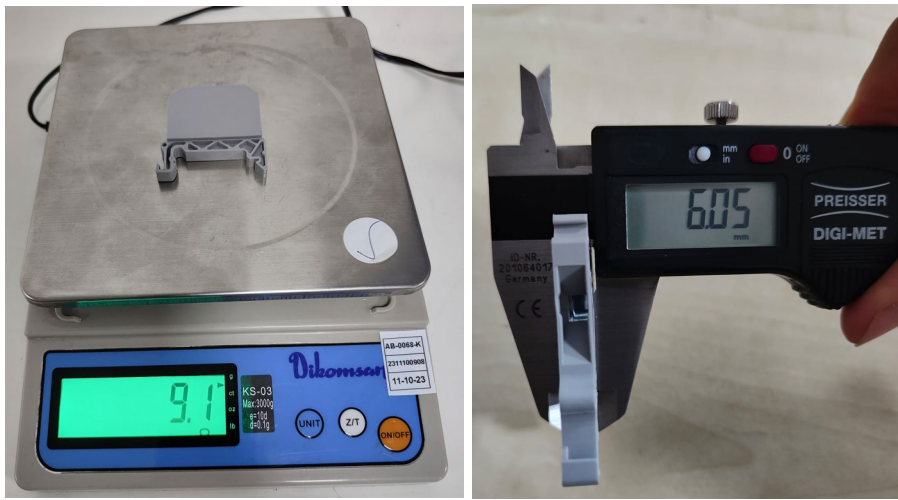
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**Table 1.2.3: Sample Components (TBL 2,5)**

<i>Product Description:</i>	Screw Type Terminal Blocks / TBL Series Feed Through Terminal Block
<i>Manufacture Part Nr:</i>	TBL 2.5
<i>Rated Values:</i>	500 V / 24 A
<i>Cross-Section:</i>	2.5 mm <sup>2</sup>
<i>Max. Tightening Torque:</i>	0.6 Nm
<i>Screw Diameter:</i>	M2.5
<i>Rated Impulse Voltage:</i>	6 kV
<i>Pollution Degree / Voltage Category / Material Group:</i>	3 / III / I
<i>Mass:</i>	7.4 g
<i>Dimensions (w-l-h):</i>	6 mm x 45.3 mm x 47.4 mm



**Photo 1.2.3: Pictures of the DUT (TBL 2,5)**

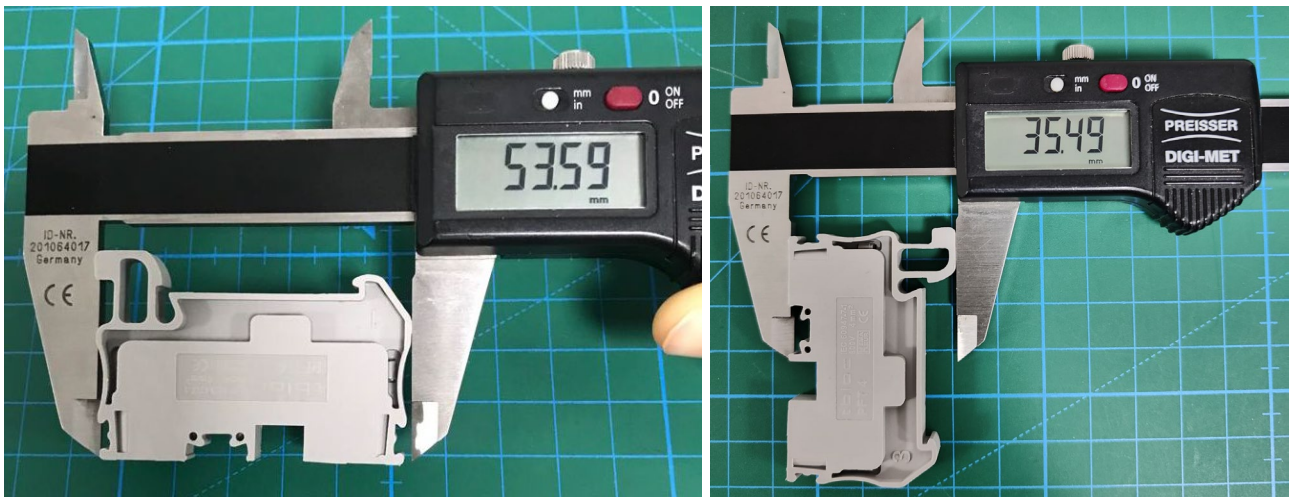
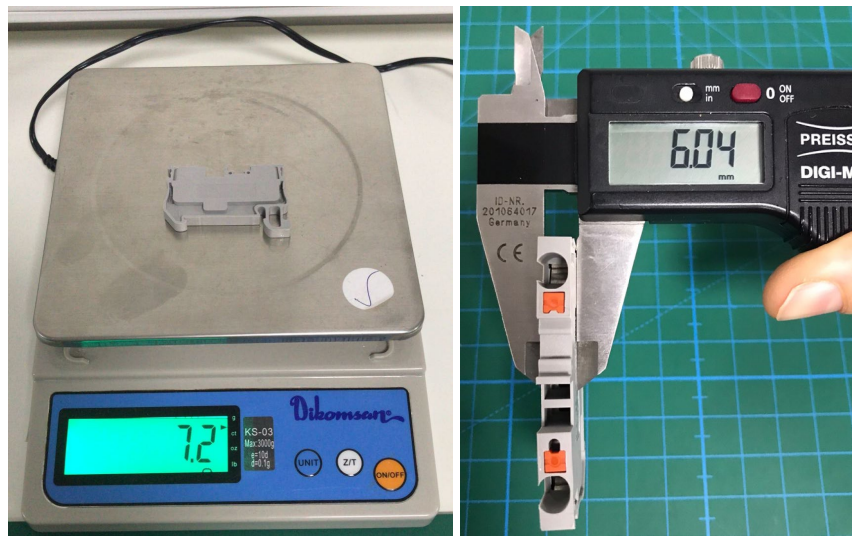
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**Table 1.2.4: Sample Components (PFT 4)**

<i>Product Description:</i>	Push-in Terminal Blocks/Feed Through Terminal Blocks
<i>Manufacture Part Nr:</i>	PFT 4
<i>Rated Values:</i>	800 V / 32 A
<i>Cross-Section:</i>	4 mm <sup>2</sup>
<i>Rated Impulse Voltage:</i>	8 kV
<i>Pollution Degree / Voltage Category / Material Group:</i>	3 / III / I
<i>Mass:</i>	7.2 g
<i>Dimensions (w-l-h):</i>	6 mm x 54 mm x 35.7 mm



**Photo 1.2.4: Pictures of the DUT (PFT 4)**

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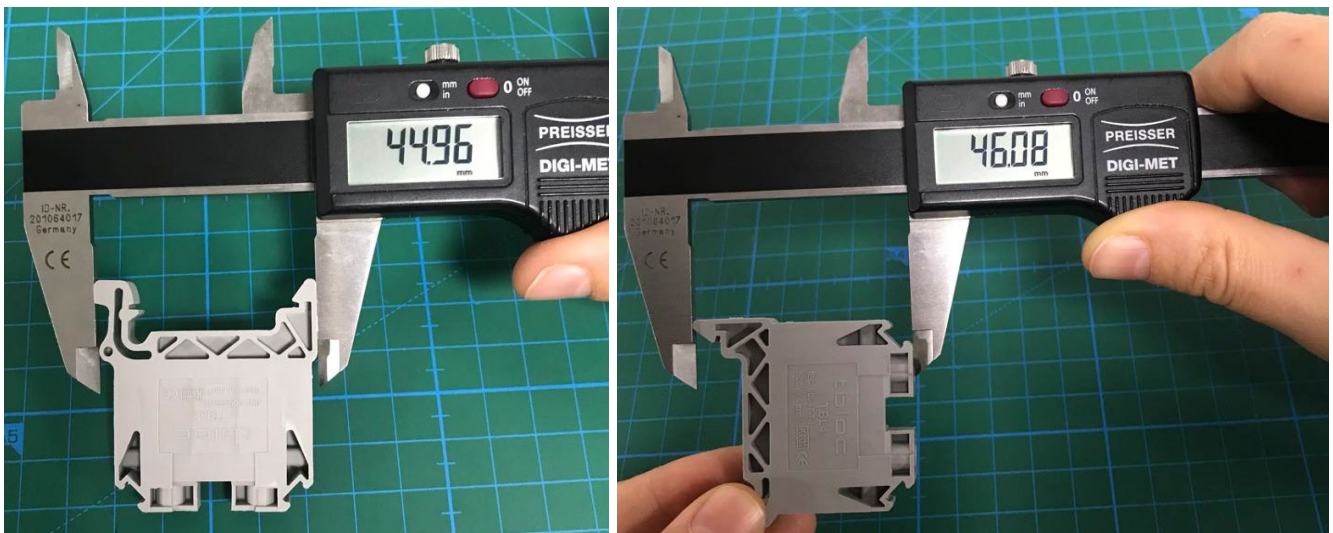
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**Table 1.2.5: Sample Components (TBL 4)**

<i>Product Description:</i>	Screw Type Terminal Blocks / TBL Series Feed Through Terminal Block
<i>Manufacture Part Nr:</i>	TBL 4
<i>Rated Values:</i>	800 V / 32 A
<i>Cross-Section:</i>	4 mm <sup>2</sup>
<i>Max. Tightening Torque:</i>	0.8 Nm
<i>Screw Diameter:</i>	M3
<i>Rated Impulse Voltage:</i>	6 kV
<i>Pollution Degree / Voltage Category / Material Group:</i>	3 / III / I
<i>Mass:</i>	10.4 g
<i>Dimensions (w-l-h):</i>	6.4 mm x 45.3 mm x 47.4 mm



**Photo 1.2.5: Pictures of the DUT (TBL 4)**

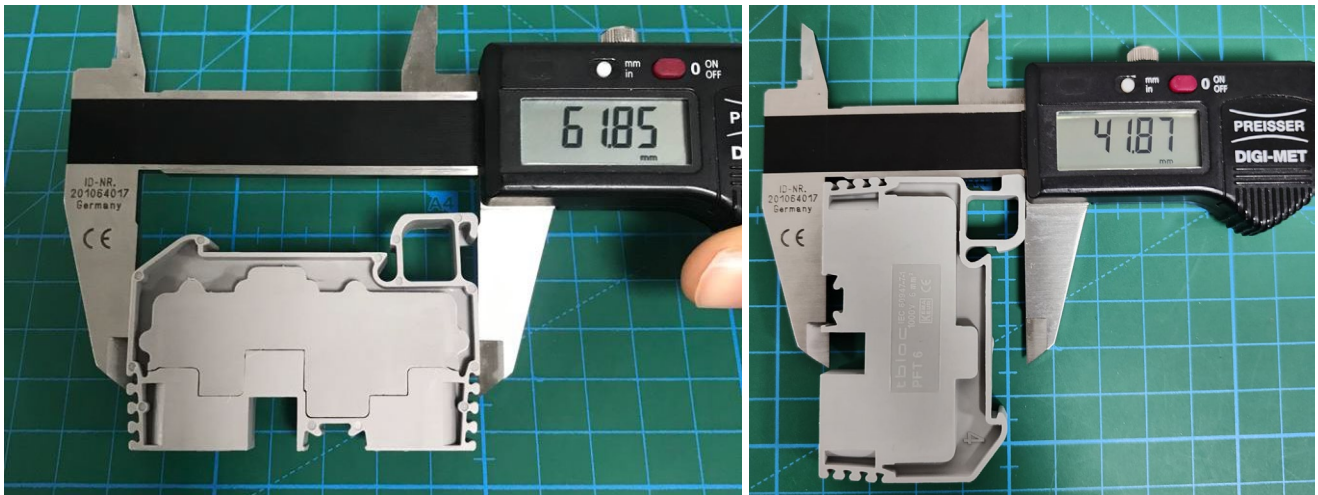
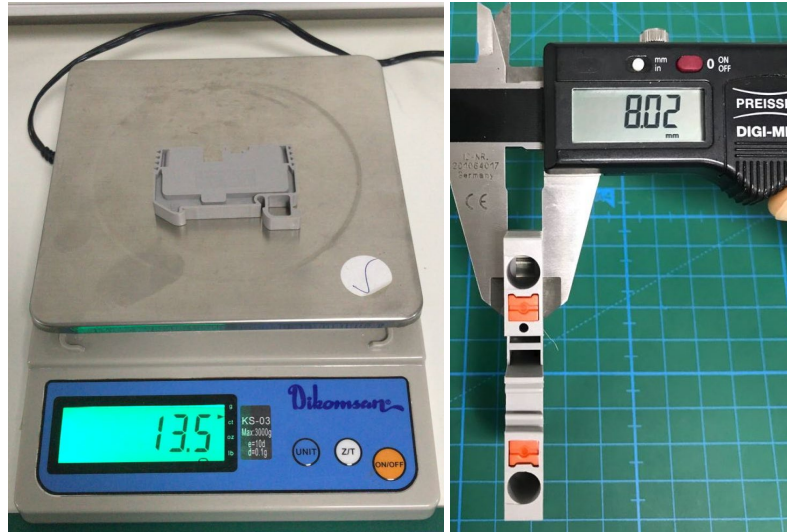
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**Table 1.2.6: Sample Components (PFT 6)**

<i>Product Description:</i>	Push-in Terminal Blocks/Feed Through Terminal Blocks
<i>Manufacture Part Nr:</i>	PFT 6
<i>Rated Values:</i>	1000 V / 41 A
<i>Cross-Section:</i>	6 mm <sup>2</sup>
<i>Rated Impulse Voltage:</i>	8 kV
<i>Pollution Degree / Voltage Category / Material Group:</i>	3 / III / I
<i>Mass:</i>	13.5 g
<i>Dimensions (w-l-h):</i>	8 mm x 61.8 mm x 41.9 mm



**Photo 1.2.6: Pictures of the DUT (PFT 6)**

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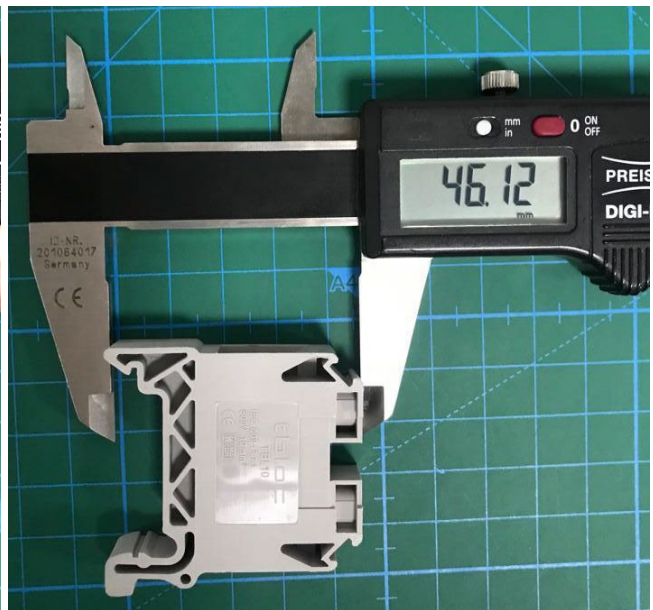
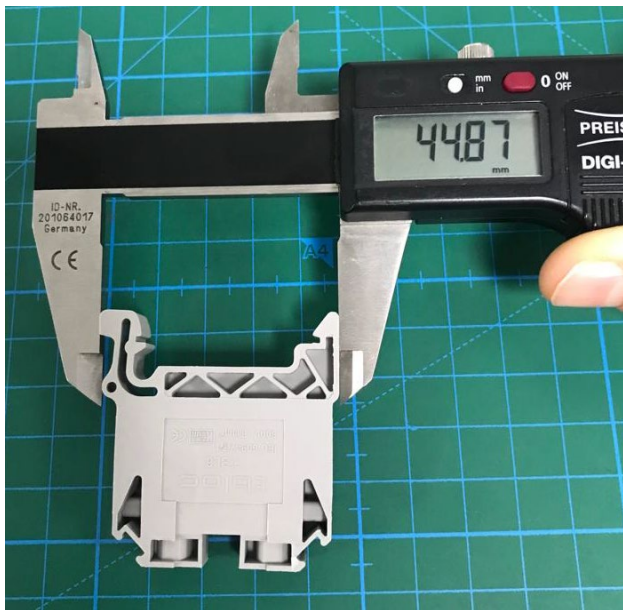
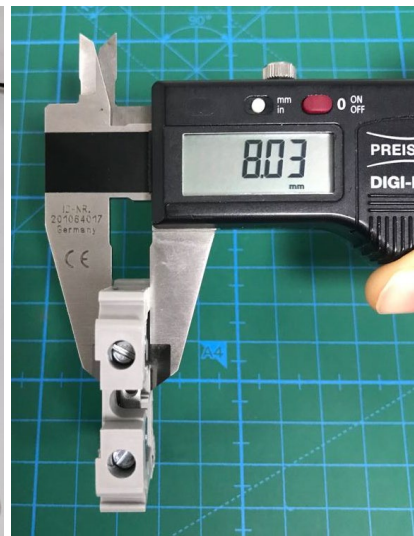
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**Table 1.2.7: Sample Components (TBL 6)**

<i>Product Description:</i>	Screw Type Terminal Blocks / TBL Series Feed Through Terminal Block
<i>Manufacture Part Nr:</i>	TBL 6
<i>Rated Values:</i>	800 V / 41 A
<i>Cross-Section:</i>	6 mm <sup>2</sup>
<i>Max. Tightening Torque:</i>	1.2 Nm
<i>Screw Diameter:</i>	M3.5
<i>Rated Impulse Voltage:</i>	8 kV
<i>Pollution Degree / Voltage Category / Material Group:</i>	3 / III / I
<i>Mass:</i>	12.4 g
<i>Dimensions (w-l-h):</i>	8 mm x 45.3 mm x 47.4 mm



**Photo 1.2.7: Pictures of the DUT (TBL 6)**

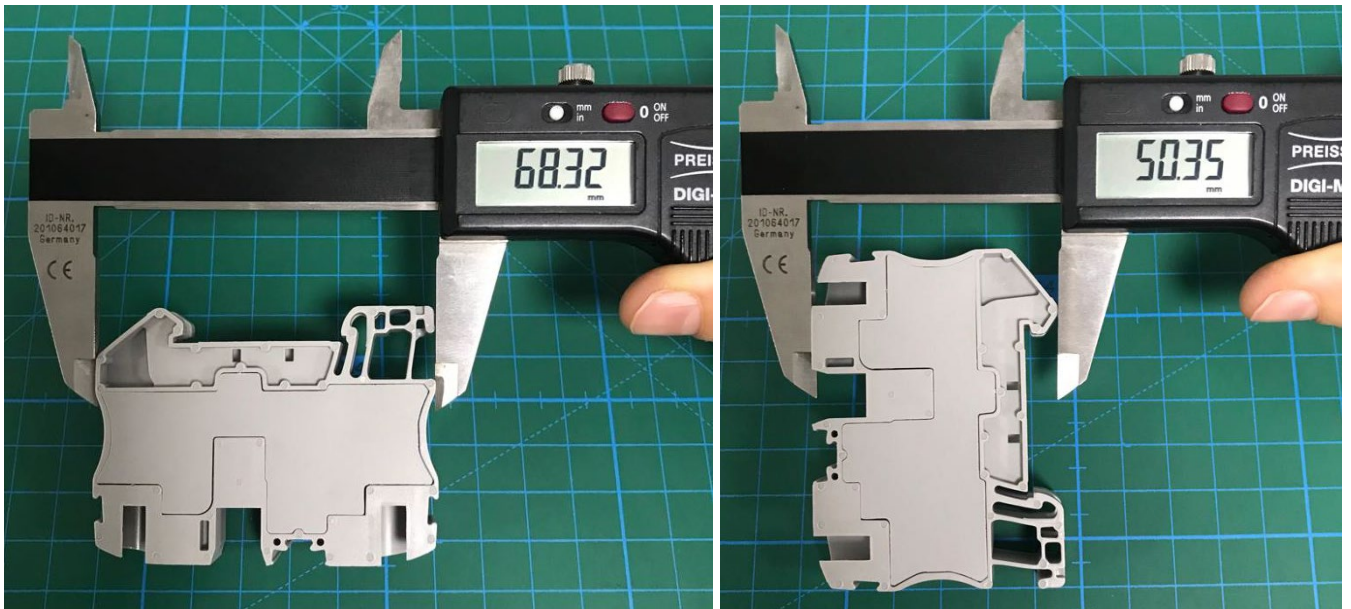
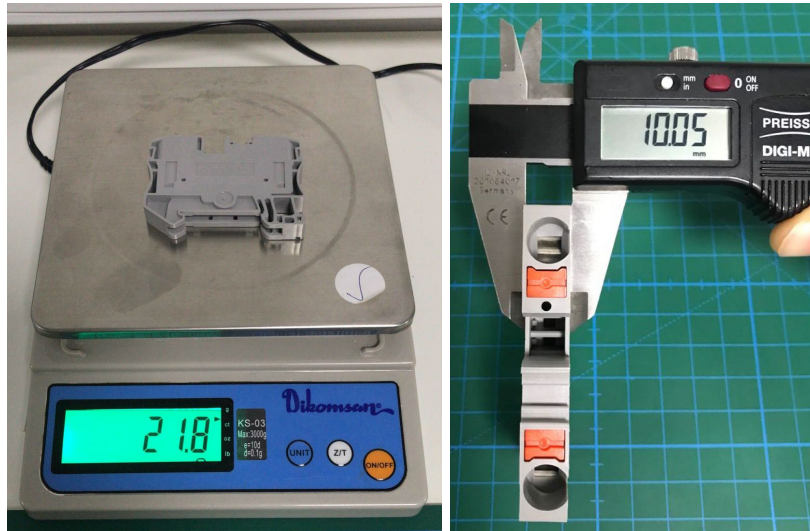
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**Table 1.2.8: Sample Components (PFT 10)**

<i>Product Description:</i>	Push-in Terminal Blocks/Feed Through Terminal Blocks
<i>Manufacture Part Nr:</i>	PFT 10
<i>Rated Values:</i>	800 V / 57 A
<i>Cross-Section:</i>	10 mm <sup>2</sup>
<i>Rated Impulse Voltage:</i>	8 kV
<i>Pollution Degree / Voltage Category / Material Group:</i>	3 / III / I
<i>Mass:</i>	21.8 g
<i>Dimensions (w-l-h):</i>	10 mm x 61.8 mm x 50.54 mm



**Photo 1.2.8: Pictures of the DUT (PFT 10)**

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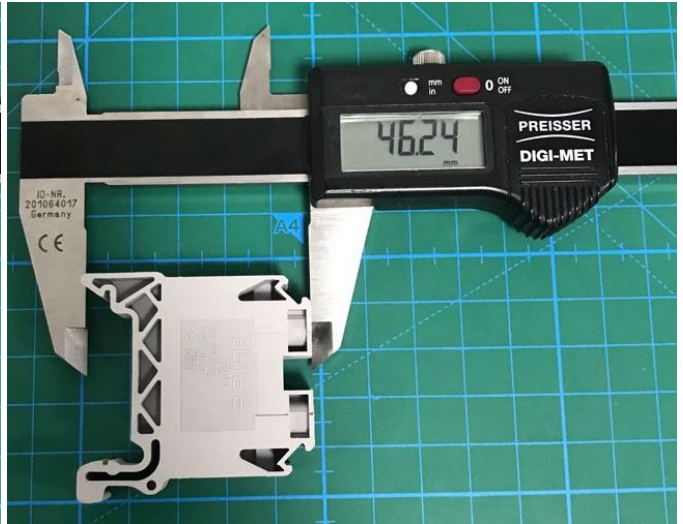
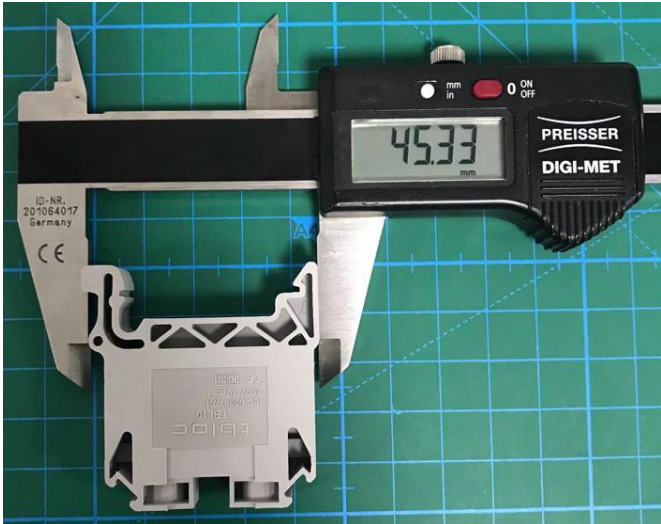
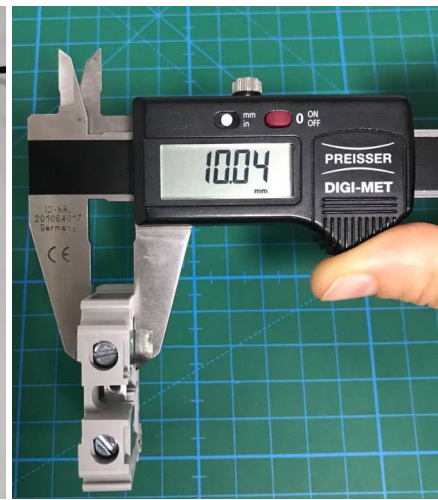
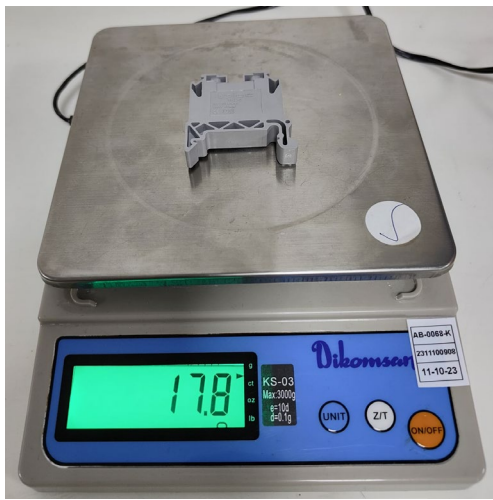
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**Table 1.2.9: Sample Components (TBL 10)**

<i>Product Description:</i>	Screw Type Terminal Blocks / TBL Series Feed Through Terminal Block
<i>Manufacture Part Nr:</i>	TBL 10
<i>Rated Values:</i>	800 V / 57 A
<i>Cross-Section:</i>	10 mm <sup>2</sup>
<i>Max. Tightening Torque:</i>	1.5 Nm
<i>Screw Diameter:</i>	M4
<i>Rated Impulse Voltage:</i>	8 kV
<i>Pollution Degree / Voltage Category / Material Group:</i>	3 / III / I
<i>Mass:</i>	16.3 g
<i>Dimensions (w-l-h):</i>	10 mm x 45.3 mm x 47.4 mm



**Photo 1.2.9: Pictures of the DUT (TBL 10)**

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## 2. List of the Applied Tests

**Table 2.1: List of the Applied Tests**

Test No.	ISO 16750-4 Clause No.	Name of the Test	Sample No.
4.1	5.1.1.1	Low Temperature Storage	10 samples from each 9 different models

Test No.	IEC/EN 60068-2-1 Clause No.	Name of the Test	Sample No.
4.1	5.2	Test Ab: Cold for non heat-dissipating specimens with gradual change of temperature	10 samples from each 9 different models

## 3. Test and Requirements

The specimen is introduced into the chamber which is at the temperature of the laboratory. The temperature is then adjusted to the temperature appropriate to the degree of severity, as specified in the relevant specification. After temperature stability of the test specimen has been reached, the specimen is exposed to these conditions for the specified duration. For specimens that are required to be operational (even though they do not meet the requirements of being heat dissipating), power shall then be applied to the specimen and a functional test is performed as necessary. A further period of stabilization may be necessary and the specimen shall then be exposed to the low temperature conditions for a duration as specified in the relevant specification. Specimens under test are normally in non-operating conditions. High air velocity circulation is normally used for this test.

### Environmental Conditions:

<b>Temperature:</b>	<b>Humidity:</b>	<b>Air Pressure:</b>
23 ± 5°C	45 - 75%	860 - 1060 mbar

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## 4. Tests

### 4.1. Low Temperature Storage Test ( Cold Test )

#### 4.1.1. Initial Measurements

##### 4.1.1.1. Mass and Dimensions

It is specified in section "1.2. Technical Information".

##### 4.1.1.2. Conductor Resistance

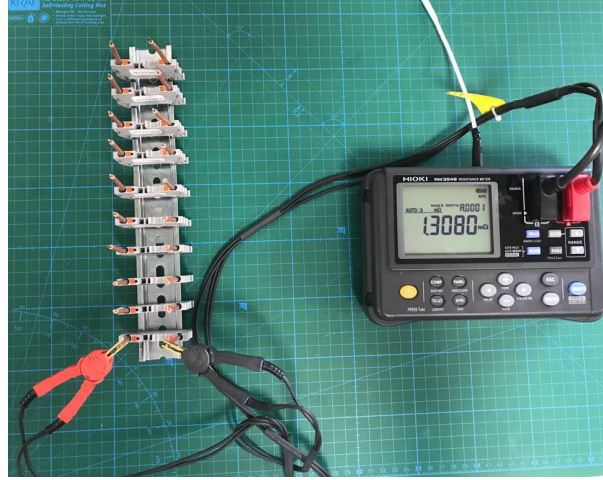


Photo 4.1.1.2.1: Conductor Resistance Measurement Before the Test (PFT 2,5)

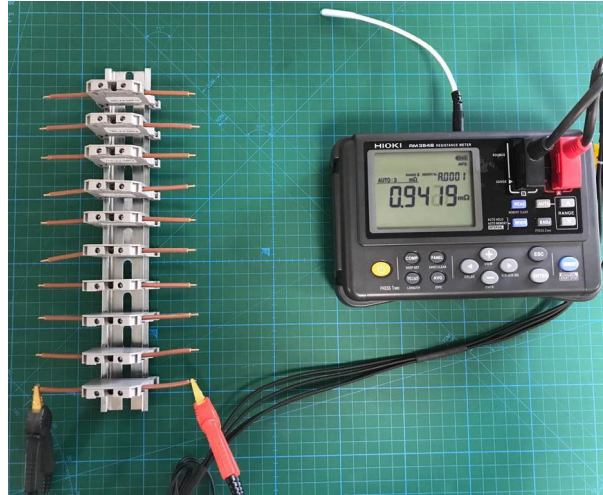
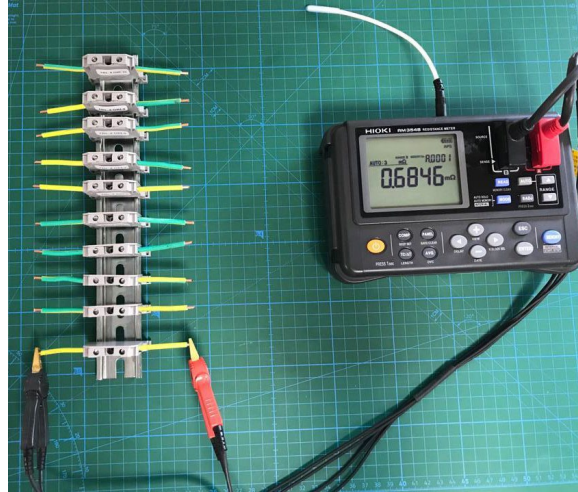


Photo 4.1.1.2.2: Conductor Resistance Measurement Before the Test (TBL 2,5)

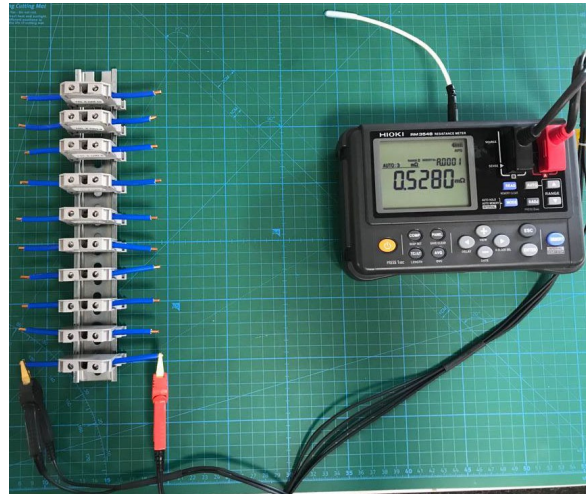
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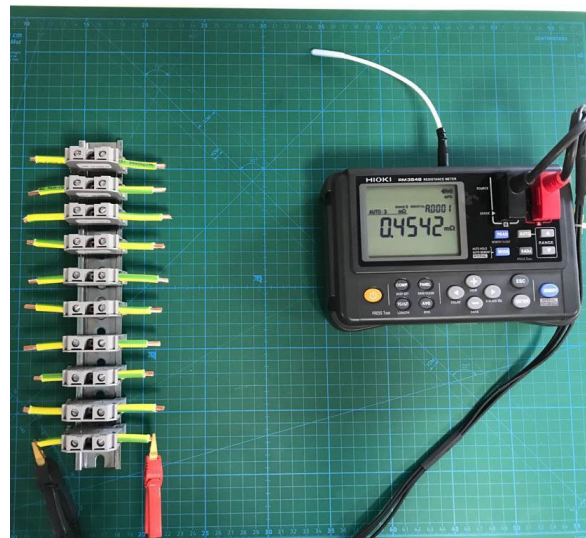
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**Photo 4.1.1.2.3: Conductor Resistance Measurement Before the Test (TBL 4)**



**Photo 4.1.1.2.4: Conductor Resistance Measurement Before the Test (TBL 6)**



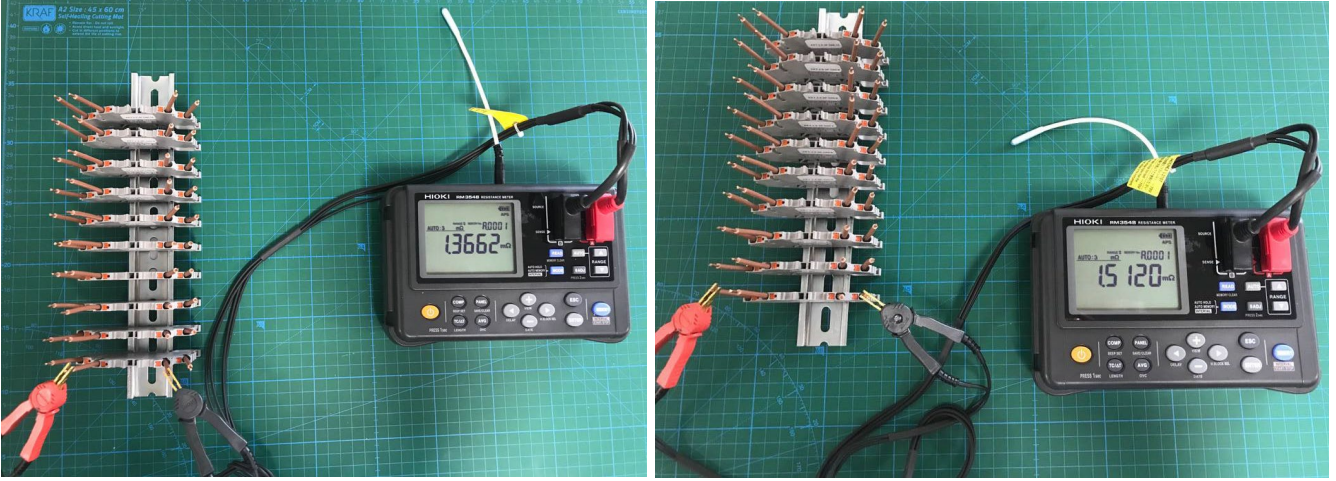
**Photo 4.1.1.2.5: Conductor Resistance Measurement Before the Test (TBL 10)**

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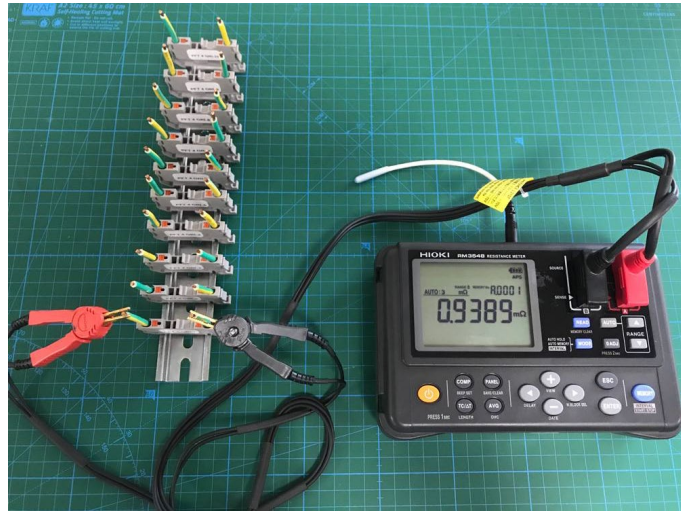
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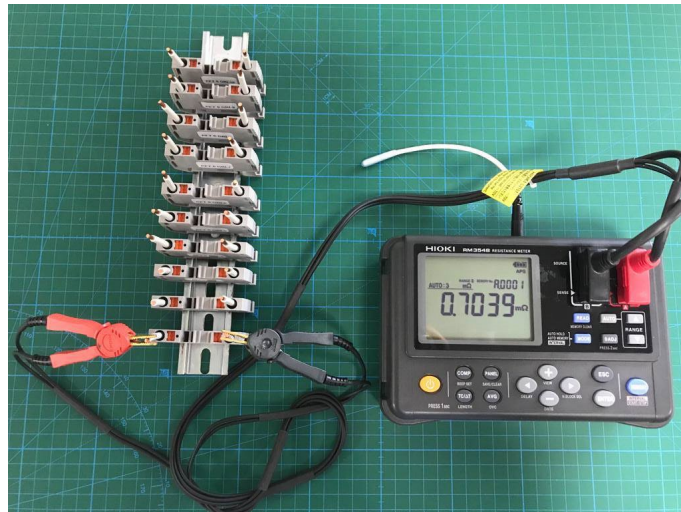




**Photo 4.1.1.2.6: Conductor Resistance Measurement Before the Test (PFT 2,5 2P)**



**Photo 4.1.1.2.7: Conductor Resistance Measurement Before the Test (PFT 4)**

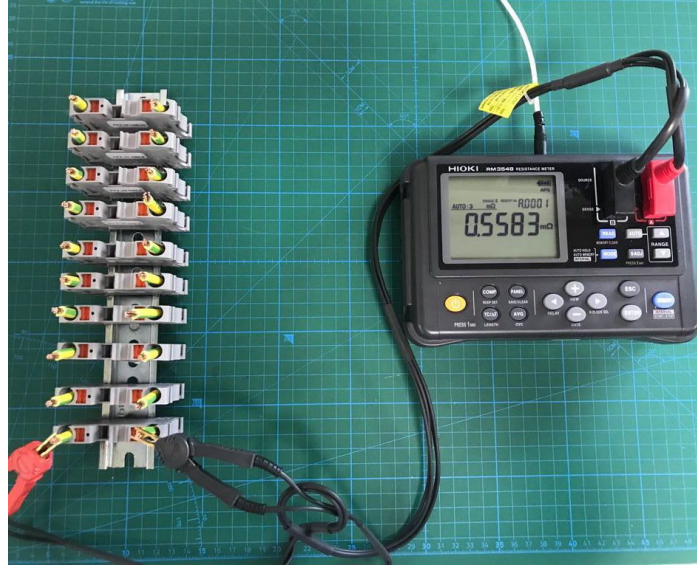


**Photo 4.1.1.2.8: Conductor Resistance Measurement Before the Test (PFT 6)**

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**Photo 4.1.1.2.9: Conductor Resistance Measurement Before the Test (PFT 10)**

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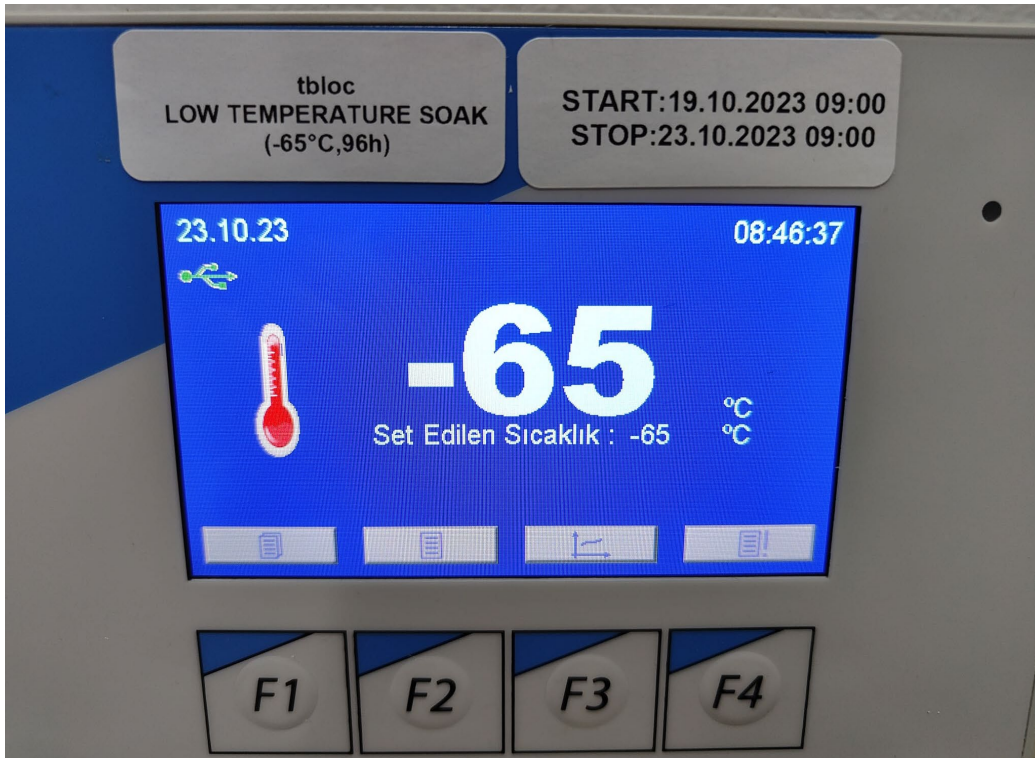


#### 4.1.2. Testing

**Test Method:** The specimen shall be exposed to the low temperature conditions for the duration, as detailed in the relevant specification. ( Table 4.1.2.2 )

**Table 4.1.2.1: Test Parameters**

T <sub>test</sub>	-65°C
Duration	96 h
Sample No	10 samples from each 9 different models
Test Date(s)	19.10.2023-23.10.2023



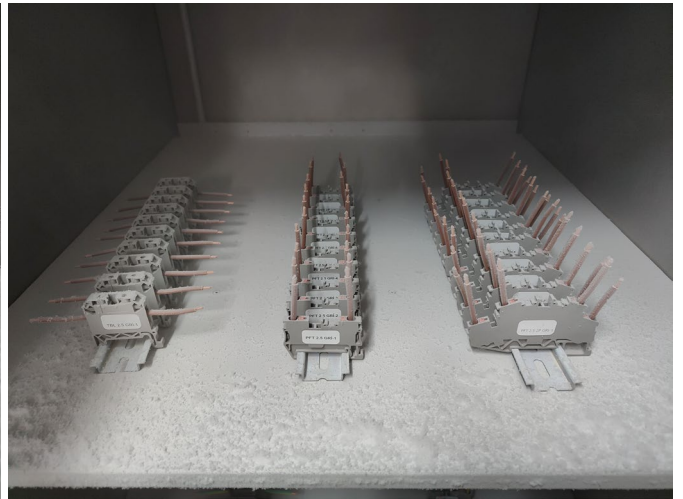
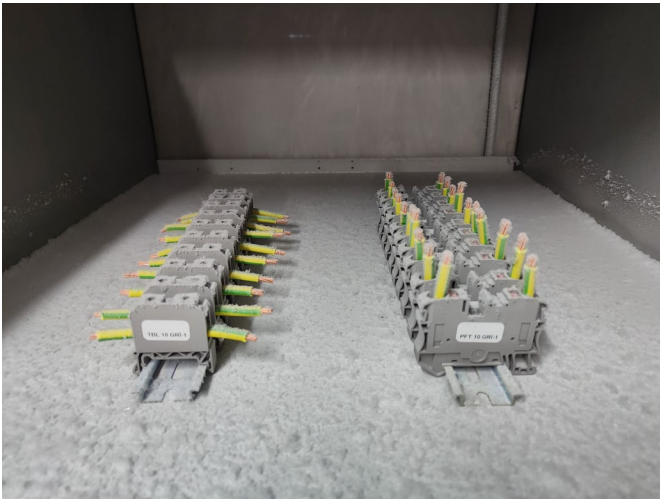
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**Photo 4.1.2.1: Pictures of the Test Setup**



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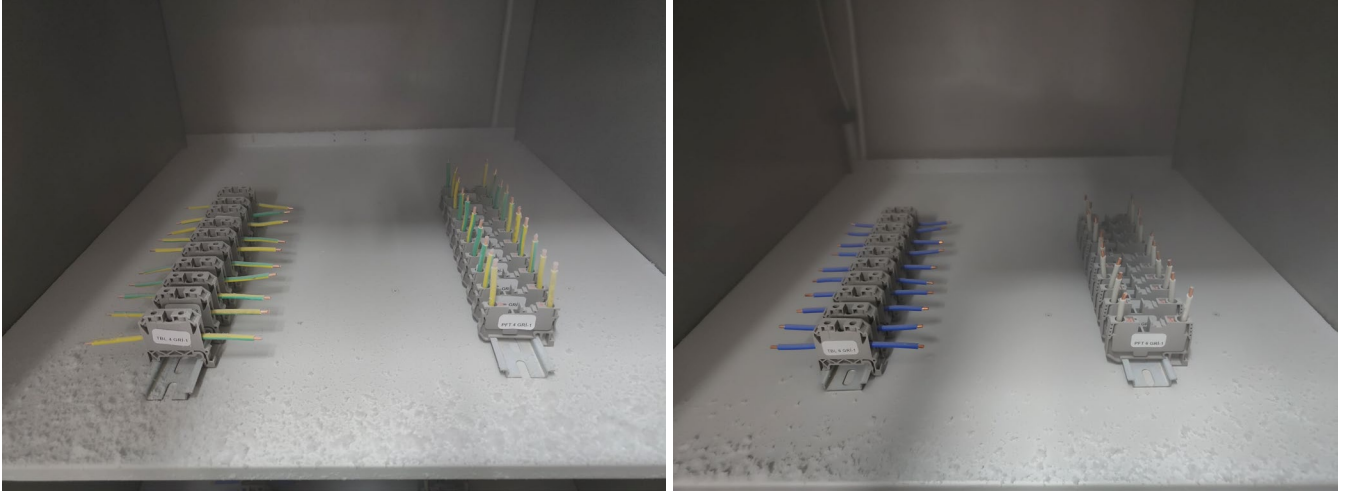


Photo 4.1.2.2: Pictures of the DuTs in the Test Cabinet

### 4.1.3. Final Measurements

#### 4.1.3.1. Mass and Dimensions

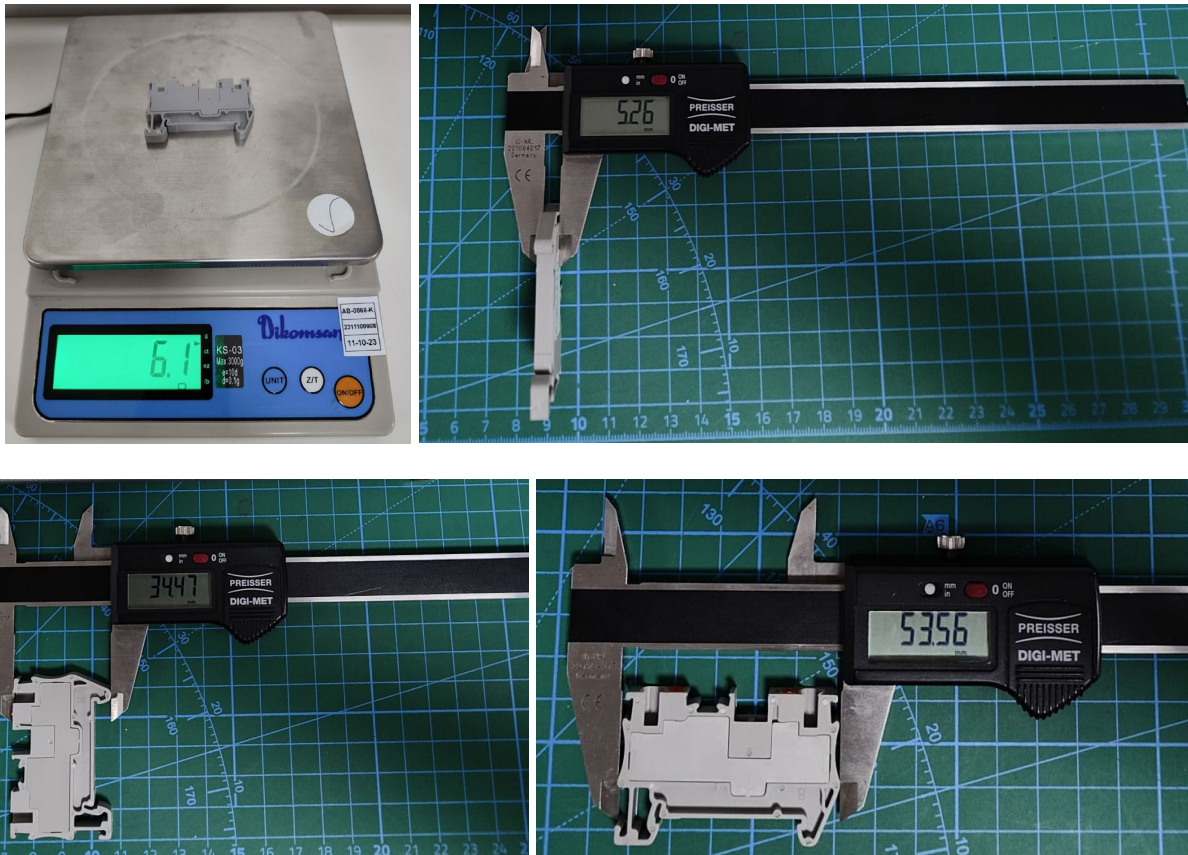


Photo 4.1.3.1.1: Pictures of the DUT (PFT 2.5)

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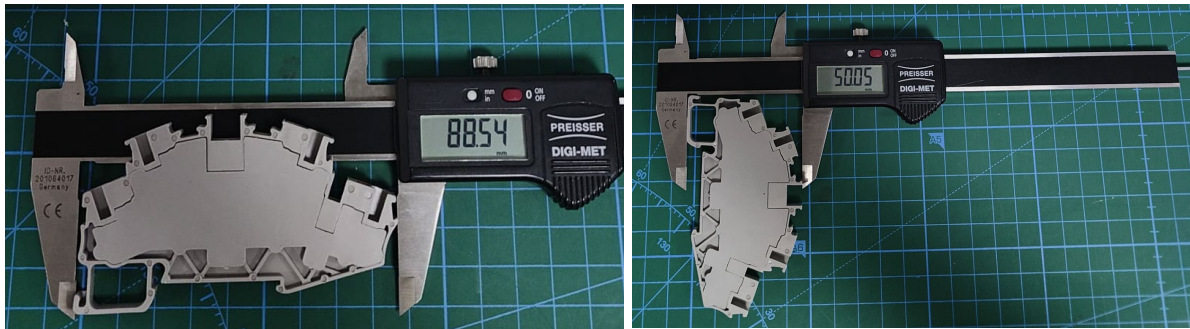
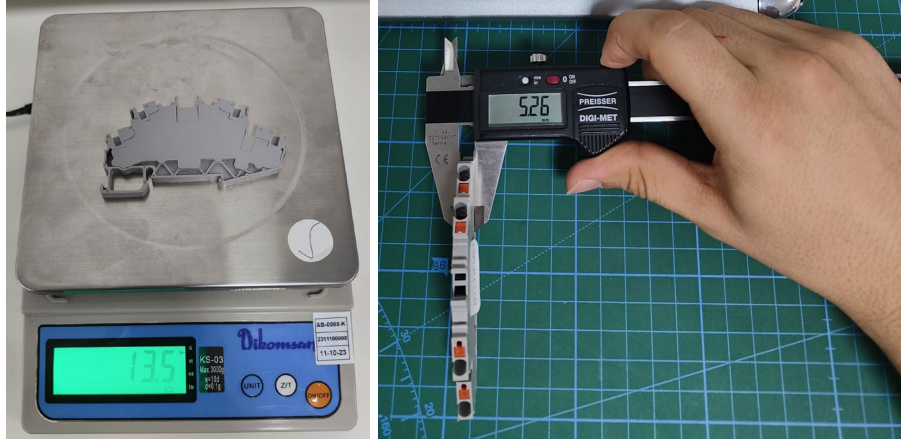


Photo 4.1.3.1.2: Pictures of the DUT (PFT 2.5 2P)

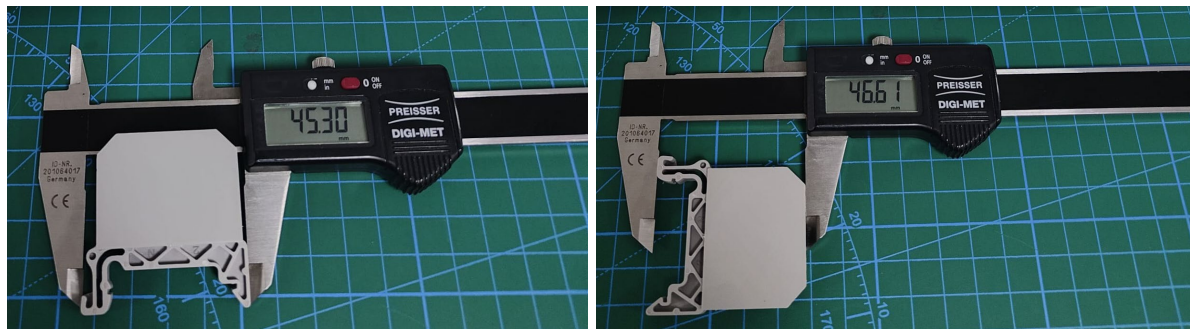
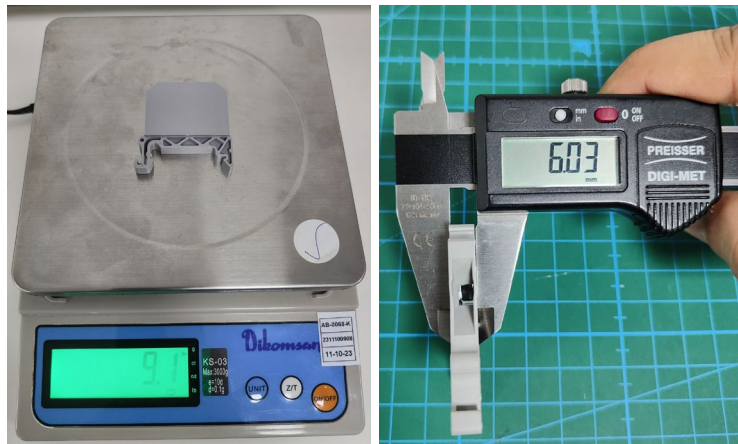


Photo 4.1.3.1.3: Pictures of the DUT (TBL 2.5)

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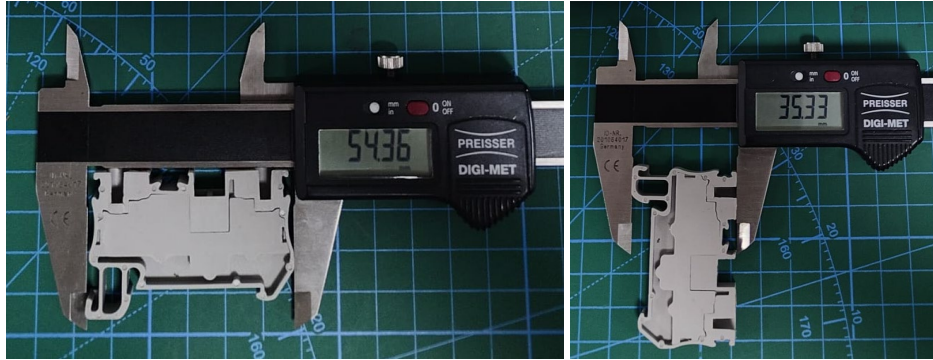


Photo 4.1.3.1.4: Pictures of the DUT (PFT 4)



Photo 4.1.3.1.5: Pictures of the DUT (TBL 4)

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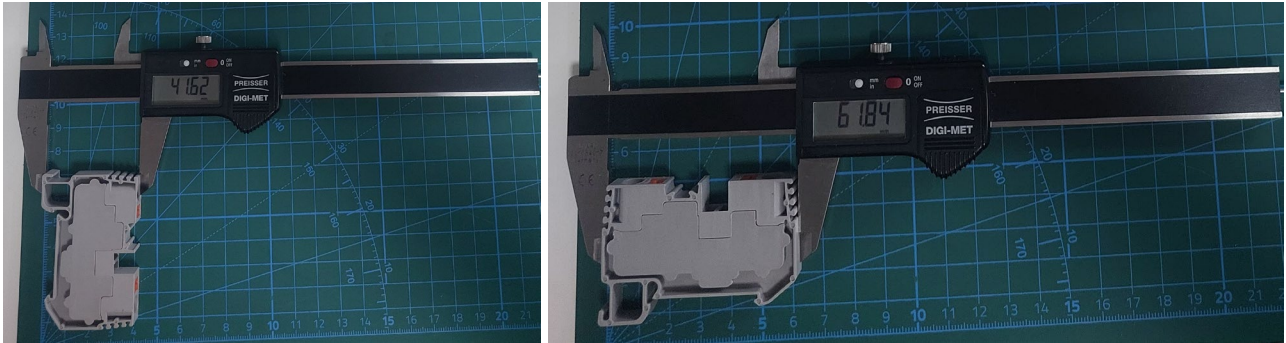


Photo 4.1.3.1.6: Pictures of the DUT (PFT 6)



Photo 4.1.3.1.7: Pictures of the DUT (TBL 6)

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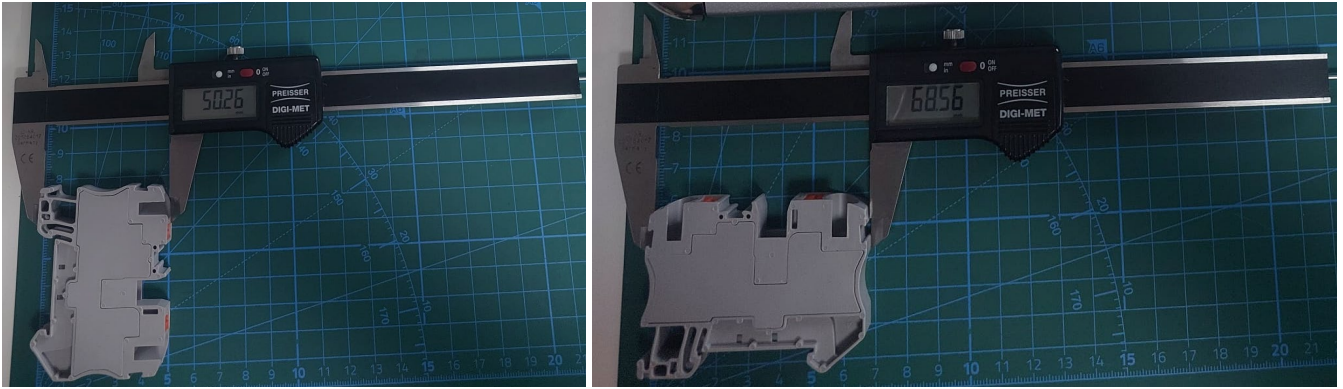
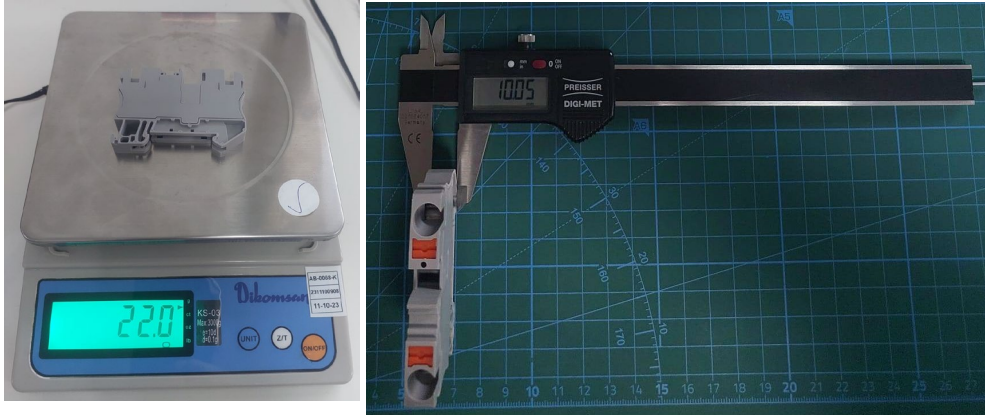


Photo 4.1.3.1.8: Pictures of the DUT (PFT 10)

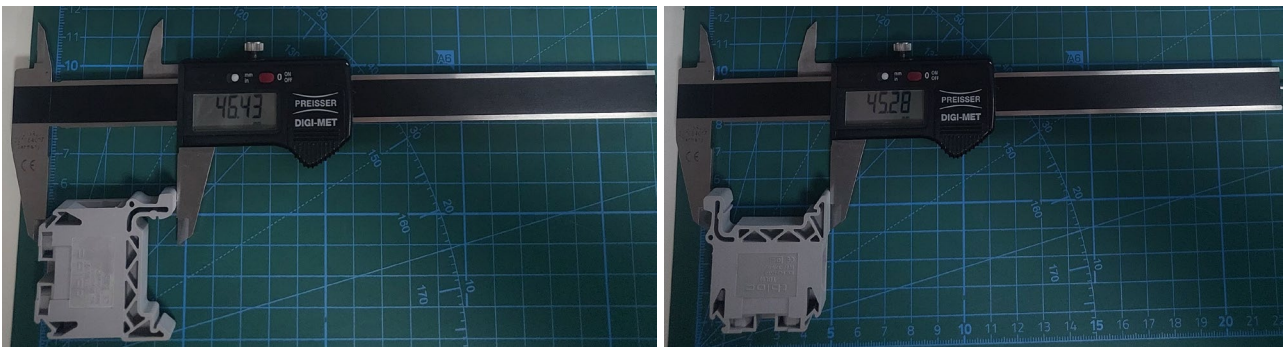
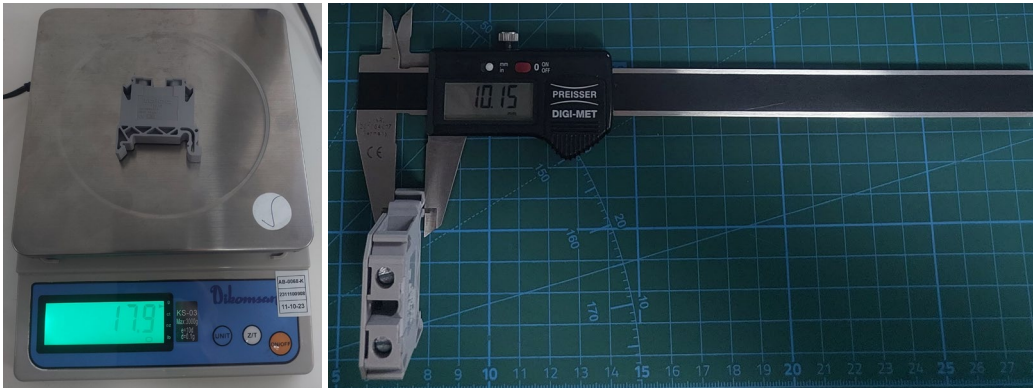


Photo 4.1.3.1.9: Pictures of the DUT (TBL 10)

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#### 4.1.3.2. Conductor Resistance

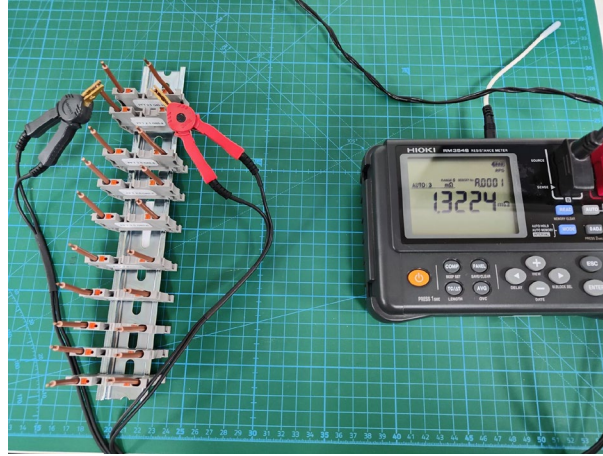


Photo 4.1.3.2.1: Conductor Resistance Measurement After the Test (PFT 2,5)

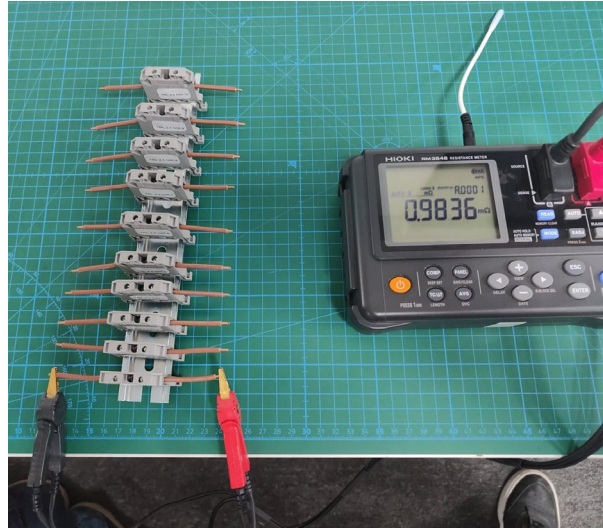


Photo 4.1.3.2.2: Conductor Resistance Measurement After the Test (TBL 2,5)

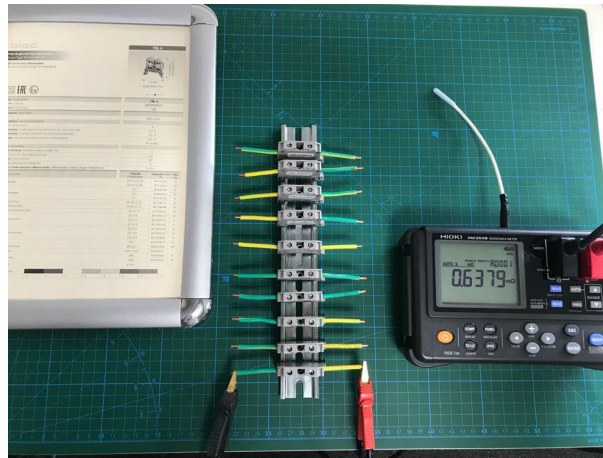
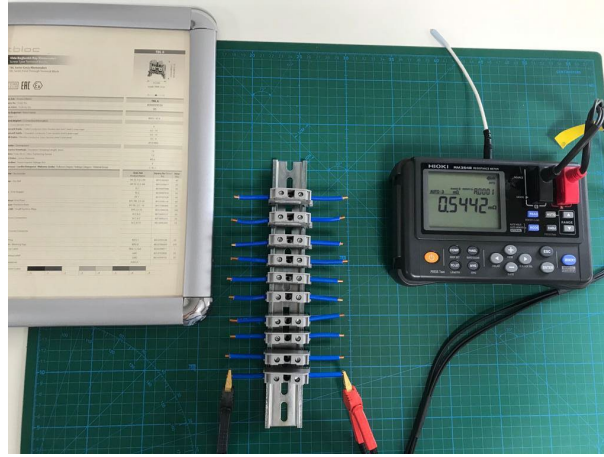


Photo 4.1.3.2.3: Conductor Resistance Measurement After the Test (TBL 4)

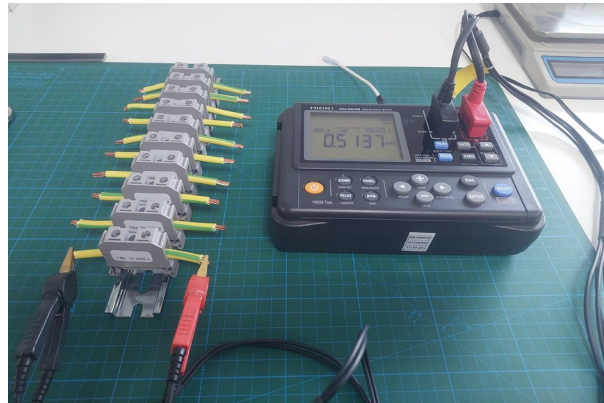
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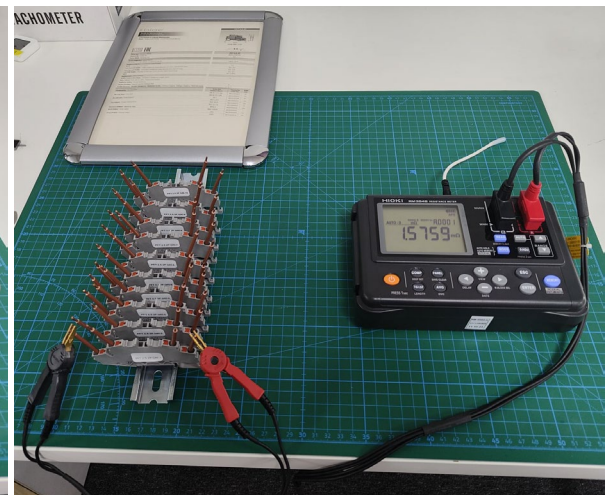
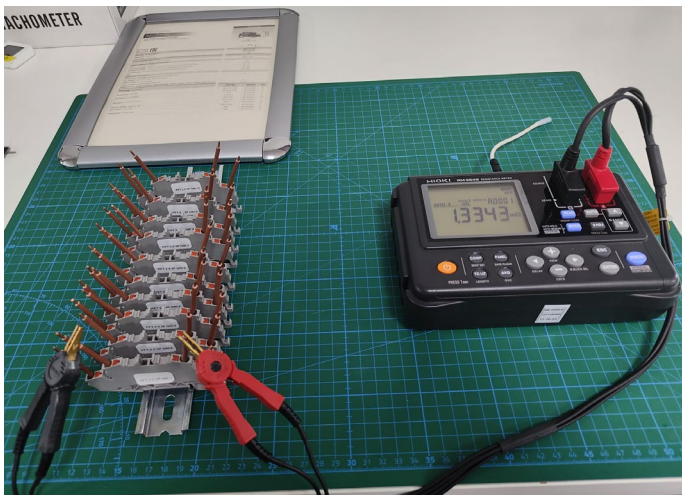
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**Photo 4.1.3.2.4: Conductor Resistance Measurement After the Test (TBL 6)**



**Photo 4.1.3.2.5: Conductor Resistance Measurement After the Test (TBL 10)**



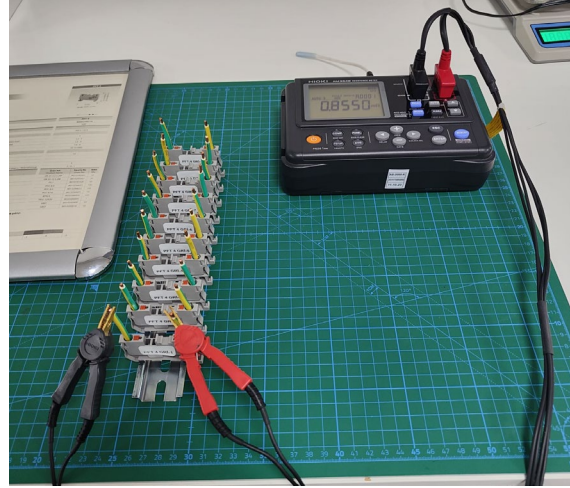
**Photo 4.1.3.2.6: Conductor Resistance Measurement After the Test (PFT 2.5 2P)**

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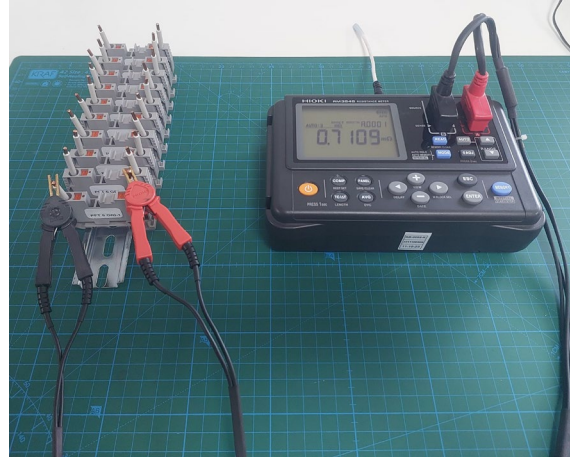
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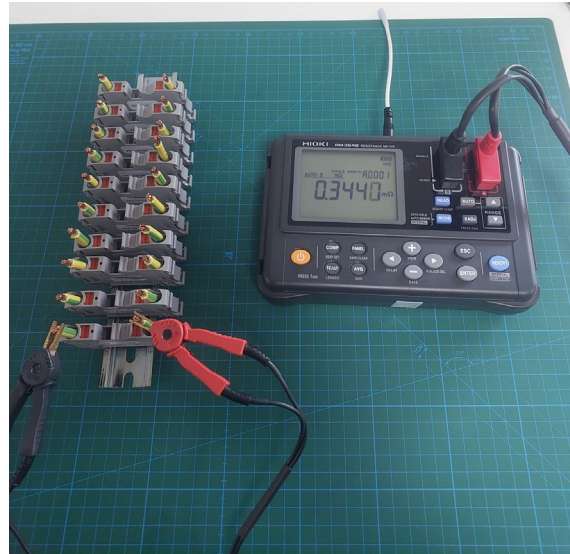




**Photo 4.1.3.2.7: Conductor Resistance Measurement After the Test (PFT 4)**



**Photo 4.1.3.2.8: Conductor Resistance Measurement After the Test (PFT 6)**



**Photo 4.1.3.2.9: Conductor Resistance Measurement After the Test (PFT 10)**

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**Table 4.1.3.2.1: Comparison Table of Mass and Dimensions Measurements**

	PFT 2.5		PFT 2.5 2P		TBL 2.5		PFT 4		TBL 4		PFT 6		TBL 6		PFT 10		TBL10	
	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final
<b>Mass (g)</b>	6	6.1	13.4	13.5	9.1	9.1	7.2	7.4	12.2	12.3	13.5	13.6	14.2	14.2	21.8	22	17.8	17.9
<b>Width (mm)</b>	5.24	5.26	5.24	5.26	6	6.03	6.04	6.11	6.46	6.40	8.02	8.05	8.03	8.02	10.05	10.05	10.04	10.15
<b>Lenght (mm)</b>	53.54	53.56	87.78	88.54	45.02	45.30	53.59	54.36	44.96	45.25	61.85	61.84	44.87	45.09	68.32	68.56	45.33	45.28
<b>Height (mm)</b>	34.49	34.47	50.13	50.05	46.65	46.61	35,49	35.33	46.08	46.21	41.87	41.62	46.12	46.18	50.35	50.26	46.24	46.43

**Table 4.1.3.2.2: Comparison Table of Conductor Resistance (mOhm) Measurements**

Initial Measurements											Date: 16.10.2023-17.10.2023										
Group	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	Sample 7	Sample 8	Sample 9	Sample 10	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	Sample 7	Sample 8	Sample 9	Sample 10	
PFT 2.5 Gray	1,3080	1,8380	1,3092	1,2894	1,2402	1,2840	1,2935	1,2561	1,4680	1,3489											
TBL 2.5 Gray	0,9419	0,8400	0,9495	0,9493	0,8027	0,8577	0,8516	0,8412	0,8443	0,9624											
TBL 4 Gray	0,6846	0,6273	0,6057	0,6240	0,6331	0,6195	0,6217	0,6230	0,5761	0,6018											
TBL 6 Gray	0,5280	0,6883	0,5254	0,5337	0,5772	0,5508	0,6885	0,6912	0,6912	0,5664											
TBL 10 Gray	0,4542	0,5363	0,1622	0,4330	0,2490	0,4045	0,7750	0,6470	0,1945	0,2845											
PFT 2.5 2P Gray Top Pin	1,3662	1,2766	1,6354	1,3368	1,2980	1,2851	1,4872	1,3474	1,4925	1,3231											
PFT 2.5 2P Gray Bottom Pin	1,5120	1,5954	1,7777	1,8074	1,7612	1,8493	1,7268	1,7971	1,5352	1,8693											
PFT 4 Gray	0,9389	0,8261	0,7807	0,8832	0,8232	0,8029	0,8749	0,8690	0,9654	0,8232											
PFT 6 Gray	0,7039	0,7304	0,9706	0,7773	0,8327	0,8078	0,8401	0,9631	1,0355	0,7331											
PFT 10 Gray	0,5583	0,4035	0,6320	0,5509	0,5145	0,6666	0,5015	0,7615	0,7837	0,5433											
Final Measurements											Date: 23.10.2023										
Group	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	Sample 7	Sample 8	Sample 9	Sample 10	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	Sample 7	Sample 8	Sample 9	Sample 10	
PFT 2.5 Gray	1,3224	1,3235	1,4499	1,2832	1,2201	1,3250	1,3323	1,3754	1,3224	1,6955											
TBL 2.5 Gray	0,9836	0,8516	0,8909	0,9728	0,8271	0,8818	0,8837	0,8366	0,8420	0,9874											
TBL 4 Gray	0,6379	0,6251	0,5994	0,6155	0,6284	0,6126	0,6308	0,6198	0,5791	0,6068											
TBL 6 Gray	0,5442	0,734	0,5364	0,5144	0,6521	0,553	0,7364	0,6714	0,6066	0,563											
TBL 10 Gray	0,5137	0,4375	0,1215	0,3185	0,1980	0,4657	0,7125	0,5705	0,1627	0,2787											
PFT 2.5 2P Gray Top Pin	1,3343	1,4556	1,3490	1,2740	1,3272	1,2179	1,3305	1,3245	1,4657	1,3751											
PFT 2.5 2P Gray Bottom Pin	1,5759	1,8851	1,6085	1,5150	1,6012	1,5735	1,6845	1,5462	1,5912	1,7540											
PFT 4 Gray	0,8550	0,8017	0,7820	0,8590	0,8273	0,8022	0,9242	0,8579	0,8671	0,8387											
PFT 6 Gray	0,7109	0,7368	1,0545	0,7861	0,7958	0,9664	0,7584	0,9915	0,9129	0,7245											
PFT 10 Gray	0,3440	0,3170	0,4785	0,5145	0,5815	0,4815	0,5295	0,6755	0,5695	0,5440											

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**Table 4.1.3.2.3: Check List**

	PFT 2.5	PFT 2.5 2P	TBL 2.5	PFT 4	TBL 4	PFT 6	TBL 6	PFT 10	TBL 10
After the experience, no issues such as fragmentation, cracking, swelling, color fading, blistering, or erasure of writings were observed in the samples. (Cover Closed)	OK.	OK.	OK.	OK.	OK.	OK.	OK.	OK.	OK.
There was no difference observed in unplugging and plugging the sample covers after the test.	OK.	OK.	OK.	OK.	OK.	OK.	OK.	OK.	OK.
After the experience, no issues such as fragmentation, cracking, swelling, color fading, blistering, or erasure of writings were observed in the samples. (Cover Opened)	OK.	OK.	OK.	OK.	OK.	OK.	OK.	OK.	OK.
There was no difference observed in the unplugging and plugging of the cables compared to before the experience.	OK.	OK.	OK.	OK.	OK.	OK.	OK.	OK.	OK.
No issues were encountered with the metal pins that the cables come into contact with after opening the sample covers.	OK.	OK.	OK.	OK.	OK.	OK.	OK.	OK.	OK.
No difference was observed in tightening and loosening the screws in screw models.	NA	NA	OK.	NA	OK.	NA	OK.	NA	OK.

<b>Requirements</b>	The specimen shall be visually inspected and such performance checks made as are required by the relevant specification.
<b>Result</b>	Inspections were made according to the check list given above. Specimen met the requirements.

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## 6. Comments

See test results. Further evaluations should be done by the client.

-emitel TR-

	
Prepared by Murat ÖZCAN	Approved by Ömer KOCABAŞ

## I. Attachment I: Equipment of the Measurements

Equipment No	Kind of equipment	Model Type	Manufacturer	Last Cal Date	Next Cal Date	Last Ver Date	Next Ver Date
03-03/45-18-001	Deep Freezer	DF 490	Nüve	13.12.2022	13.12.2023	---	---
03-03/32-19-001	Resistance Meter	RM3548	Hioki	11.10.2023	11.10.2024	---	---
03-03/50-07-001	Digital Calliper	Preisser Digi-Met 0-150mm	Conrad Elektronik GmbH	12.10.2023	12.10.2024	---	---
03-03/50-10-001	Digital Scale	KS-03	Dikomsan	11.10.2023	11.10.2024	---	---

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