Convention N° 268

Section Laboratoires

ATTESTATION D'ACCREDITATION

ACCREDITATION CERTIFICATE

N° 1-0579 rév. 10

Le Comité Français d'Accréditation (Cofrac) atteste que :
The French Committee for Accreditation (Cofrac) certifies that :

MICHAUD
N° SIREN : 314634338

Satisfait aux exigences de la norme **NF EN ISO/IEC 17025 : 2017**
Fulfils the requirements of the standard

et aux règles d'application du Cofrac pour les activités d'analyses/essais/étalonnages en :
and Cofrac rules of application for the activities of testing/calibration in :

ELECTRICITE / ACCESSOIRES ET CABLES UTILISES POUR LES RESEAUX DE TRANSPORT DE L'ENERGIE - APPAREILLAGE INDUSTRIEL BASSE TENSION
ELECTRICITY / ACCESSORIES AND CABLES USED FOR THE ENERGY TRANSPORT NETWORKS - LOW VOLTAGE INDUSTRIAL APPARATUS

réalisées par / *performed by* :

MICHAUD
Unité de Recherche - ZI Le Blanchon
490, rue Georges Convert - CS 90100
01160 PONT D'AIN

et précisément décrites dans l'annexe technique jointe
and precisely described in the attached technical appendix

L'accréditation suivant la norme internationale homologuée NF EN ISO/IEC 17025 est la preuve de la compétence technique du laboratoire dans un domaine d'activités clairement défini et du bon fonctionnement dans ce laboratoire d'un système de management adapté (cf. communiqué conjoint ISO-ILAC-IAF en vigueur disponible sur le site internet du Cofrac www.cofrac.fr)

Accreditation in accordance with the recognised international standard NF EN ISO/IEC 17025 demonstrates the technical competence of the laboratory for a defined scope and the proper operation in this laboratory of an appropriate management system (see current Joint ISO-ILAC-IAF Communiqué available on Cofrac web site www.cofrac.fr) .

Le Cofrac est signataire de l'accord multilatéral d'EA pour l'accréditation, pour les activités objets de la présente attestation.
Cofrac is signatory of the European co-operation for Accreditation (EA) Multilateral Agreement for accreditation for the activities covered by this certificate.

Date de prise d'effet / *granting date :* **01/03/2023**
Date de fin de validité / *expiry date :* **29/02/2028**

Pour le Directeur Général et par délégation
On behalf of the General Director

Le Responsable du Pôle Bâtiment-Electricité,
Pole manager - Building-Electricity,

Kerno MOUTARD

La présente attestation n'est valide qu'accompagnée de l'annexe technique.
This certificate is only valid if associated with the technical appendix.

L'accréditation peut être suspendue, modifiée ou retirée à tout moment. Pour une utilisation appropriée, la portée de l'accréditation et sa validité doivent être vérifiées sur le site internet du Cofrac (www.cofrac.fr).
The accreditation can be suspended, modified or withdrawn at any time. For a proper use, the scope of accreditation and its validity should be checked on the Cofrac website (www.cofrac.fr).

Cette attestation annule et remplace l'attestation N° 1-0579 Rév 9.
This certificate cancels and replaces the certificate N° 1-0579 Rév 9.

Seul le texte en français peut engager la responsabilité du Cofrac.
The Cofrac's liability applies only to the french text.

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Section Laboratoires

Laboratory Part

ANNEXE TECHNIQUE

à l'attestation N° 1-0579 rév. 10

TECHNICAL ANNEXURE
To agreement N° 1-0579 revision 10

L'accréditation concerne les prestations réalisées par :

The accreditation is based on the following services provided by :

MICHAUD
Unité de Recherche - ZI Le Blanchon
490, rue Georges Convert - CS 90100
01160 PONT D'AIN

Dans son unité technique :

Within the technical unit :

LABORATOIRE D'ESSAIS

Elle est accordée selon le périmètre suivant :

It is provided according to the following scope :

Electricité / Appareillage industriel basse tension
/ Essais de sécurité et de performance (13)

Electricity / Low Voltage industrial equipment
/ Safety and performance tests (13)

Electricité / Accessoires et câbles utilisés pour les réseaux de transport de l'énergie
/ Essais de sécurité et de performance (44)

Electricity / Accessories and cables used for energy networks
/ Safety and performance tests (44)

Pour tous les essais concernant cette accréditation :

(*) Le laboratoire est reconnu compétent pour adopter toute méthode reconnue dans le domaine couvert par la portée générale (FLEX2).

La liste exhaustive des normes mises en œuvre est tenue à jour par le laboratoire.

For all these tests within the scope of the present accreditation :

(*) The laboratory is recognised qualified to use any recognised method in the area covered by the general scope (FLEX2).

The standards settled down exhaustive list is up-dated by the laboratory.

MICHAUD Independent Type Test Laboratory COFRAC accredited *(English translation made by MICHAUD)*
General scope :

Electricity / Low voltage industrial equipment (13) ***Electricity / Accessories and cables used for energy networks (44)***				
N°	***Test type***	***Tested item***	***Measured characteristic***	***Method principle***
1	*Electrical ageing tests*	*LV industrial equipment* *Overhead accessories* *Underground accessories*	*Electrical resistance, temperature, distance, time, cycles number*	*Thermal cycles are applied on connectors and accessories (heating period of time, flowing current with cooling sequences) and can sometimes face short circuit of small duration according to usage (see overcurrent test).*
2	*Thermal cycling tests*	*Overhead accessories* *Underground accessories*	*Temperature, voltage, time, immersion/buried depth, cycles number, check of good test behaviour, dielectric test at the end of sequence*	*Thermal cycles are applied on connectors and accessories (heating period of time, flowing current with cooling sequences). Cycles are performed in the air, under water or buried, under a 2 kV three phase AC current.*
3	*Electrical contact measure*	*LV industrial equipment* *Underground accessories*	*Electrical resistance*	*The electric contact resistance is defined when measuring voltage drop at equipment or accessory terminal blocks when DC current flows through.*
4	*Heating and consumption test*	*LV industrial equipment* *Overhead accessories* *Underground accessories*	*Temperature, current*	*Heating is applied on equipment, flowing AC current with defined level. Sometimes short circuit of small duration can be applied (see overcurrent test).*
5	*Overload running test*	*LV industrial equipment*	*Temperature, current, time, cycles number*	*Heating is applied on equipment, flowing AC current. Each cycle comprises a period with defined test current, followed with a period of overcurrent. These heating tests are separated by cooling period of time.*
10	*Overcurrent test*	*LV industrial equipment* *Overhead accessories* *Underground accessories*	*Electrical resistance, temperature, current, time, overcurrent number*	*Short period of time of overcurrent are applied on connectors and associated cables during the electrical ageing test or heating test.*
11	*Under load opening/closing test*	*LV industrial equipment*	*Voltage, current, COS Phi, time, actions number, running ability to operate under normal conditions*	*Under voltage and under load opening/closing operations are performed on equipment fitted with fuse cartridge or solid link.*
20	*Dielectric test under industrial frequency*	*LV industrial equipment* *Overhead accessories* *Underground accessories*	*Voltage, time, immersion depth (pressure), no leakage*	*Alternative current to industrial frequency is applied between equipment active parts and earth (water, aluminium sheet, steel balls,...).*
21	*Test for dielectric strength at shock voltage*	*LV industrial equipment* *Overhead accessories* *Underground accessories*	*Voltage, pulse width, time, immersion depth (pressure), no leakage*	*Voltage shock is applied between equipment active parts and earth (water, aluminium sheet,...).*
22	*Insulation resistance test*	*LV industrial equipment* *Overhead accessories* *Underground accessories*	*Electric resistance, voltage, time, immersion depth (pressure),*	*Insulation resistance measure under direct current is applied between equipment active parts and earth (water, aluminium sheet,...).*
23	*Watertightness test*	*Overhead accessories*	*Immersion depth (pressure), Visual water penetration*	*Connectors fitted on conductors are immersed in water.*
30	*Climatic ageing test*	*Overhead accessories*	*Temperature, humidity, light, time, cycles number, dielectric test, watertightness, mechanical load or mechanical tightening after exposure*	*Accelerated climatic ageing cycles are applied on equipment, comprising period of time of UV exposure (through xenon arc lamp), high temperature with humidity, low temperature and water spray.*
31	*UV exposure*	*LV industrial equipment*	*Temperature, time, No degradation, voltage measurements, IP degree of protection or mechanical shock withstanding after exposure*	*Accelerated climatic ageing cycles are applied on equipment, comprising period of time of UV exposure through mercury steam lamp and sometimes temperature changes.*
32	*Low temperature assembly test*	*LV industrial equipment* *Overhead accessories*	*Temperature, tightening torque, dielectric test or mechanical load test after exposure*	*Equipment installation is performed at low temperature.*
33	*Moist heat test*	*LV industrial equipment*	*Temperature, humidity, time, cycles number, no degradation, dielectric test, contact resistance test, IP degree of protection or mechanical shock withstanding after exposure*	*Temperature and humidity cycles are applied to the equipment.*
34	*Dry heat test*	*LV industrial equipment*	*Temperature, time, no degradation*	*Thermal ageing is applied to the equipment.*
40	*Salt spray corrosion test*	*LV industrial equipment* *Overhead accessories*	*Temperature, humidity, time, salt concentration, no visual rust*	*Salt spray is applied to the equipment.*

Electricity / Low voltage industrial equipment (13) Electricity / Accessories and cables used for energy networks (44)				
N°	**Test type**	**Tested item**	**Measured characteristic**	**Method principle**
41	Sulphur dioxide corrosion test	Overhead accessories	Temperature, humidity, time, sulphur dioxide concentration, no visual rust Mechanical tightening test or mechanical load test after exposure	Humid environment including sulphur dioxide is applied to the equipment.
42	Corrosion test with withstanding to soda	Overhead accessories	Soda concentration, immersion depth, no visual rust	Connectors and conductors are immersed under soda solution.
50	IP degree of protection test for envelopes	LV industrial equipment Underground accessories	Non access to internal part, protection against object or water penetration	Envelope protection check is performed against dangerous part access with solid foreign elements penetration, water penetration.
51	IK degree of protection test for envelopes	LV industrial equipment	Shock energy, distance, no degradation, IP degree of protection check after exposure	Energy shocks are applied on envelopes thanks to hammer with rounded surface at ambient temperature after potential exposure to specific temperature.
52	Resistance to mechanical shocks caused by sharp edge objects	LV industrial equipment	Shock energy, distance, penetration force	Energy shocks are applied on envelopes using sharp shaped hammers at ambient temperature after potential exposure to specific temperature.
53	Resistance to mechanical shocks	Underground accessories	Shock energy, distance, dielectric test after shocks	Energy Shocks are applied on envelopes using wedge shaped hammers at ambient temperature.
54	Resistance to mechanical shocks at low temperature	Overhead accessories	Temperature, shock energy, no degradation	Mechanical shocks are applied to connectors when kept at low temperature.
55	Resistance to mechanical shock of replacement elements fixing pad	LV industrial equipment	Shock energy, distance, no degradation	Energy shock are applied on replacement elements fixing pad thanks to hammers. Shock are applied at ambient temperature after potential exposure to specific temperature.
60	Mechanical tightening test	Overhead accessories Underground accessories	Temperature, tightening torque, contact torque, breaking torque	Tightening test and mechanical resistance test are applied to connectors tightening screws and nuts.
61	Tightening screws and nuts check-up	LV industrial equipment	Tightening torque, mechanical resistance of tested parts, traction load, time, distance, visual inspection	Mechanical resistance tests are applied on tightening screws and nuts to check behaviour, mechanical resistance and conductors tightening quality.
62	Metal inserts mechanical strength check-up	LV industrial equipment	Tightening torque, traction load, visual inspection	Tightening tests and pull-out tests from housing are applied on metal inserts.
63	Crimping test	Overhead accessories	Check-up of die closing under wedges mechanical load	Crimping tests are applied on compression connectors.
64	Mechanical load test	Overhead accessories Underground accessories	No breaking, measurement of sliding or deformation under specific mechanical load	Mechanical load is applied on equipment.
65	Elastic clamping jaws mechanical strength check-up	LV industrial equipment	Mechanical load	Mechanical load is applied on replacement elements fitted in elastic clamping jaws.
66	Arrow test	LV industrial equipment	Force, distance, temperature	Mechanical load is applied on envelope side after potential exposure to specific temperature.
67	Rollover test	LV industrial equipment	Force, distance	Mechanical load is applied on envelope top wall to check resistance to deformation.
68	Endurance test under mechanical and thermal load	Overhead accessories	Temperature, traction load, time, sliding, dielectric test and mechanical load measurements after exposure	Heating period of time, flowing current with cooling sequences are applied to materials and conductors associated. Mechanical loads are applied simultaneously (with/without cycles).
69	Behaviour checking at abnormal heat (hot balls test)	LV industrial equipment	Temperature, time, compressive strength, distance	Synthetic materials resistance behaviour to heat is checked by applying a weight through a spheric end at a specific temperature.
70	Marking indelibility and data	LV industrial equipment Overhead accessories	Marking resistance and durability	Marking indelibility is checked by rubbing the surface with a cloth soaked with water and then with hexane.

Accreditation is mandatory according to the French rules as mentioned in the COFRAC document AB INF 99 available on ***www.cofrac.fr***

Effective date : 01/03/2023 ; Validity date : 29/02/2028

This Technical Annexure cancels and replaces the Technical Annexure 1-0579 Rév. 9.