

Company : BITOLagertechnik

Contact : Zietek Marlon

Email : zma@bito.com

PO : PO0176124-05 du 18/07/2025

Project : Thermal analysis study

History:

→ **V01 : 08/18/2025 by : GLIONNA Magali**

→ **V02 : 08/27/2025 by : GLIONNA Magali ,**

Revision nature : Modification of the legend of the graph : "4L - 4 cold packs" instead of "4L - 8 cold packs"

Revision reason : Mistake during excel table filling

This version cancels and replaces the previous version(s). The destruction of the previous version(s) is the responsibility of the customer.

Writing and validation :

Written and signed by : METZGER Camille, Engineer, on, 08/27/2025 electronically.
(camille.metzger@metropack.fr)

Validated and signed by : GLIONNA Magali, Quality manager, on, 08/27/2025 electronically.
(magali.glionna@metropack.fr)

Company : BITOLagertechnik

Contact : Zietek Marlon

Email : zma@bito.com

PO : PO0176124-05 du 18/07/2025

Protocol reminder :

- 1 - Tests specimen(s)
- 2 - Test specimens preparation
- 3 - Climatic conditioning
- 4 - Conclusions
- 5 - Certifications

Company : BITOLagertechnik

Contact : Zietek Marlon

Email : zma@bito.com

PO : PO0176124-05 du 18/07/2025

1 - Tests specimen(s)

Description:

The test is performed on the following samples.

On receipt of the samples, a visual check is carried out on each item, based on the following points:

→ General condition of the test item

1 . 1 Tests parameters :

Batch	Type	Value
9937-V02-01-A	Sample type	1 box 4 L
		2 boxes 15 L
	Samples quantity	1 box 4 L with 4 cold packs
		1 box 15 L with 8 cold packs
		1 box 15 L with 12 cold packs

→ **Delivery control** : No visible degradation.



1. 1 : Box 4 L



1. 2 : Box 15 L

Not to be reproduced, except in its entirety, without the permission of METROPACK

Company : BITOLagertechnik

Contact : Zietek Marlon

Email : zma@bito.com

PO : PO0176124-05 du 18/07/2025

2 - Test specimens preparation

Description:

Pack-out performed according to customer recommendation.

For box 4 L with 4 cold packs :

- 1 cold pack is placed in the bottom of box
- 2 cold packs are placed upright behind the inner shell
- 1 data logger is placed in the center of the box
- 1 cold pack is placed on top on the inner lid shell

For box 15 L with 8 cold packs :

- 4 cold packs are placed in the bottom of box
- 1 data logger is placed in the center of the box
- 4 cold packs are placed on top on the inner lid shell

For box 15 L with 12 cold packs :

- 4 cold packs are placed in the bottom of box
- 2 cold packs are placed upright behind the inner shell
- 1 data logger is placed in the center of the box
- 4 cold packs are placed on top on the inner lid shell

2 . 1 Equipment :

Internal Number	Name	Next metrology
M-00372	Data Logger ISTA	06/18/2026
M-00373	Data Logger ISTA	06/18/2026
M-00374	Data Logger ISTA	06/18/2026

Not to be reproduced, except in its entirety, without the permission of METROPACK

Test report PR9937 - 00843 on 08/18/2025

Company : BITOLagertechnik
Contact : Zietek Marlon
Email : zma@bito.com
PO : PO0176124-05 du 18/07/2025

2 . 2 Tests parameters :

Batch	Type	Value
9937-V02-01-A	Quantity of probe	1 probe per box centered in the middle of the box
	Recording Interval	10 minutes
	Specific requirements	- Box 4 L with 4 cold packs, temperature must be between 2 °C and 8 °C during 43 hours
		- Box 15 L with 8 cold packs, temperature must be between 2 °C and 8 °C during 37 hours
	- Box 15 L with 12 cold packs, temperature must be between 2 °C and 8 °C during 48 hours	

2 . 3 Results :

Observations:

Probes are placed according to the following picture.

Test report PR9937 - 00843 on 08/18/2025

Company : BITOLagertechnik

Contact : Zietek Marlon

Email : zma@bito.com

PO : PO0176124-05 du 18/07/2025



2. 1 : Probe

Company : BITOLagertechnik
Contact : Zietek Marlon
Email : zma@bito.com
PO : PO0176124-05 du 18/07/2025

3 - Climatic conditioning

Description:

Cold packs are stored in a conditioning atmosphere below before pack out.

Climatic conditioning performed according to NF S 99-700 Appendix E profile Winter 48d.

Cold packs are stored in a conditioning atmosphere below before pack out.

Climatic conditioning performed according to NF S 99-700 Appendix E profile Summer 48a

3 . 1 Equipment :

Internal Number	Name	Next metrology
M-00144	CS-70/1000-5 - Climatic chamber	09/26/2025
M-00725	C-65/100 Climatic chamber (M-00208)	07/17/2026

3 . 2 Tests parameters :

→ **Duration** : 24 Hour(s)

→ **Temperature** : 0 °C

→ **Humidity** : NA % RH

→ **Specific requirements** :

Climatic conditioning performed according to NF S 99-700 Appendix E profile Winter 48d.

Climatic conditioning performed according to NF S 99-700 Appendix E profile Summer 48a.

3 . 3 Results :

Observations:

Test report PR9937 - 00843 on 08/18/2025

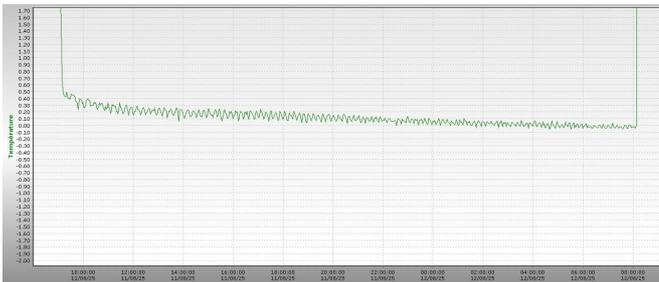
Company : BITOLagertechnik

Contact : Zietek Marlon

Email : zma@bito.com

PO : PO0176124-05 du 18/07/2025

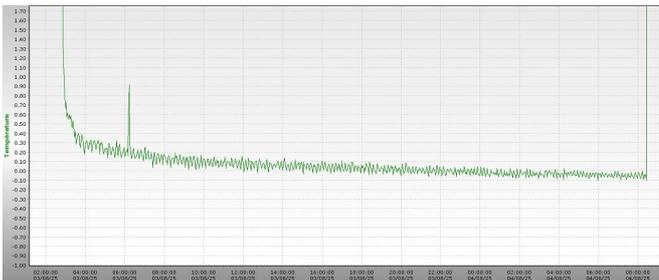
Before inserting cold packs in the boxes, cold packs stay 15 minutes at ambient temperature.



3. 1 : Cold packs winter pre conditioning



3. 2 : Winter conditioning



3. 3 : Cold packs summer pre conditioning



3. 4 : Summer conditioning

Company : BITOLagertechnik

Contact : Zietek Marlon

Email : zma@bito.com

PO : PO0176124-05 du 18/07/2025

4 - Conclusions

Description:

Datas are send to the customer by email.

According to customer criteria :

- Box 4 L with 4 cold packs, temperature must be between 2 °C and 8 °C during 43 hours
- Box 15 L with 8 cold packs, temperature must be between 2 °C and 8 °C during 37 hours
- Box 15 L with 12 cold packs, temperature must be between 2 °C and 8 °C during 48 hours

NF S 99-700 Appendix E profile Winter 48d results :

Box 4 L with 4 cold packs, temperature is included between 2 °C and 8 °C during 46 hours. The result is in compliance with customer criteria.

Box 15 L with 8 cold packs, temperature must be between 2 °C and 8 °C during 46 hours. The result is in compliance with customer criteria.

Box 15 L with 12 cold packs, temperature must be between 2 °C and 8 °C during 47 hours. The result is not in compliance with customer criteria as the temperature inside the box needs 1 hour to reach 8 °C after the placement of cold packs.

NF S 99-700 Appendix E profile Summer 48a results :

Box 4 L with 4 cold packs, temperature is included between 2 °C and 8 °C during 47 hours. The result is in compliance with customer criteria.

Box 15 L with 8 cold packs, temperature must be between 2 °C and 8 °C during 46 hours. The result is in compliance with customer criteria.

Box 15 L with 12 cold packs, temperature must be between 2 °C and 8 °C during 47 hours. The result is not in compliance with customer criteria as the temperature inside the box needs 1 hour to reach 8 °C after the placement of cold packs.

Company : BITOLagertechnik
 Contact : Zietek Marlon
 Email : zma@bito.com
 PO : P00176124-05 du 18/07/2025

5 - Certifications

Description:

List of certifications :



This recognizes that the company listed below is a Certified Thermal Transport Laboratory member of the International Safe Transit Association (ISTA).

Metropack

Reims, France

Member ID: 9218

Certification valid through 08/31/2026

A.J. Gruber
 ISTA President

Eric Hiser
 ISTA Vice President - Technical



N° 2013/53419.6

Certificat

Certificate

Page 1 / 1

AFNOR Certification certifie que le système de management mis en place par :
 AFNOR Certification certifies that the management system implemented by:

METROPACK

pour les activités suivantes :
 for the following activities:

REALISATION DE TESTS ET D'ESSAIS DE CONTRAINTES PHYSIQUES, MECANIQUES ET CLIMATIQUES SUR PRODUITS, EMBALLAGES ET MATERIAUX.

PHYSICAL, MECHANICAL AND CLIMATIC CONSTRAINT AND OTHER TESTS ON PRODUCTS, PACKAGING AND MATERIALS.

a été évalué et jugé conforme aux exigences requises par :
 has been assessed and found to meet the requirements of:

ISO 9001 : 2015

et est déployé sur les sites suivants :
 and is developed on the following locations:

ZAC CROIX BLANDIN 30-32, RUE DU CAPITAINE GEORGES MADON FR-51100 REIMS

Ce certificat est valable à compter du (arrêté/mois/jour)
 This certificate is valid from (year/month/day)

2025-03-02

Jusqu'au
 Until

2028-03-01



Julien NZR
 Directeur Général d'AFNOR Certification
 Managing Director of AFNOR Certification



Flâchez ce QR
 Code pour vérifier la
 validité du certificat

Test report PR9937 - 00843 on 08/18/2025

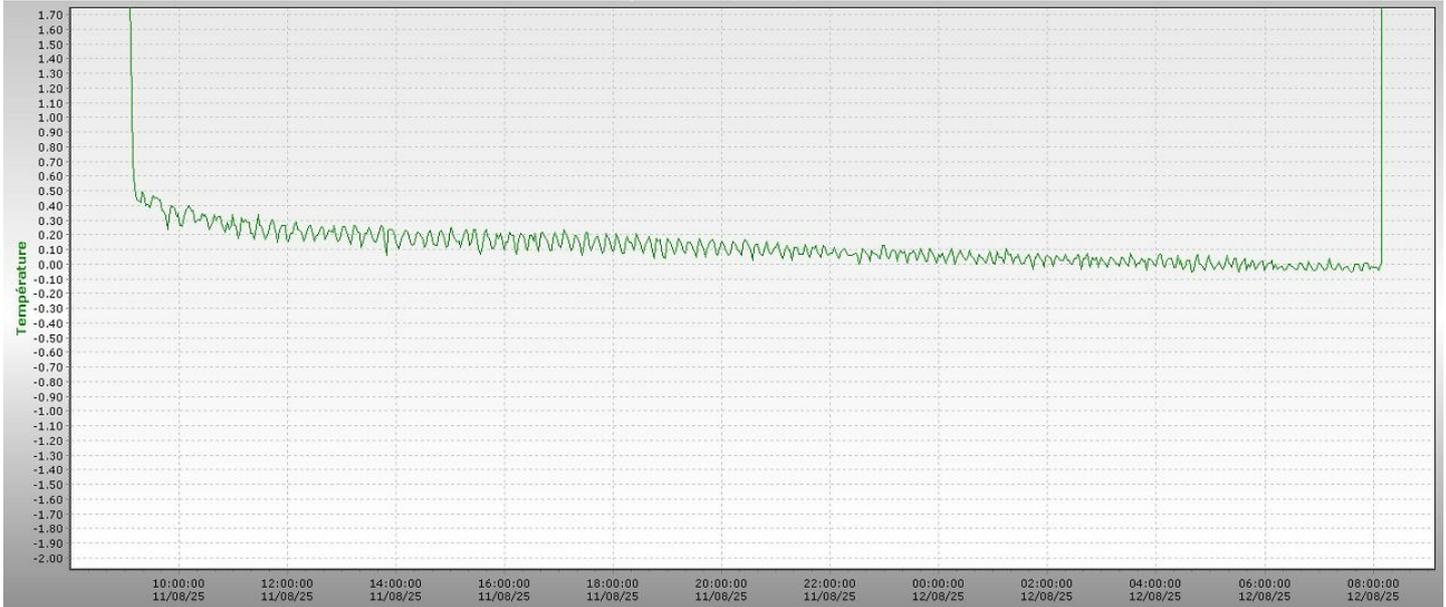
Company : BITOLagertechnik

Contact : Zietek Marlon

Email : zma@bito.com

PO : PO0176124-05 du 18/07/2025

**ANNEXE : 3 . 1 Climatic conditioning
Cold packs winter pre conditioning**



Test report PR9937 - 00843 on 08/18/2025

Company : BITOLagertechnik

Contact : Zietek Marlon

Email : zma@bito.com

PO : PO0176124-05 du 18/07/2025

**ANNEXE : 3 . 2 Climatic conditioning
Winter conditioning**



Test report PR9937 - 00843 on 08/18/2025

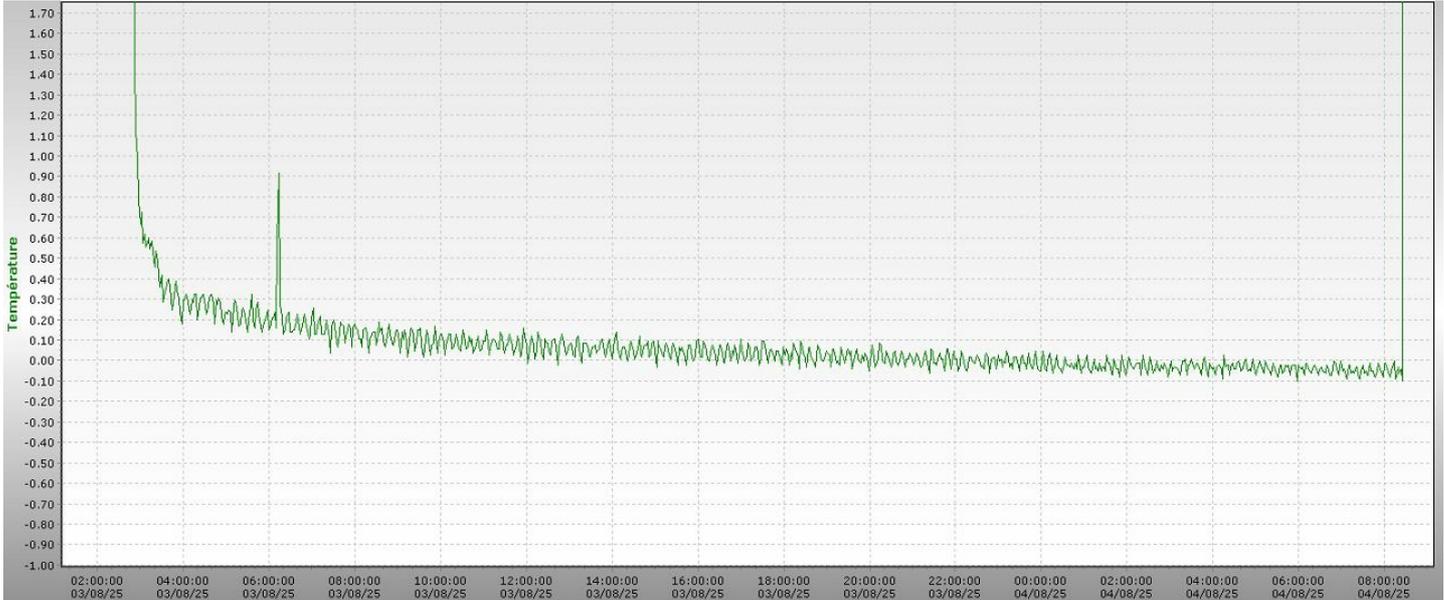
Company : BITOLagertechnik

Contact : Zietek Marlon

Email : zma@bito.com

PO : PO0176124-05 du 18/07/2025

**ANNEXE : 3 . 3 Climatic conditioning
Cold packs summer pre conditioning**



Test report PR9937 - 00843 on 08/18/2025

Company : BITOLagertechnik

Contact : Zietek Marlon

Email : zma@bito.com

PO : PO0176124-05 du 18/07/2025

**ANNEXE : 3 . 4 Climatic conditioning
Summer conditioning**



Company : BITOLagertechnik

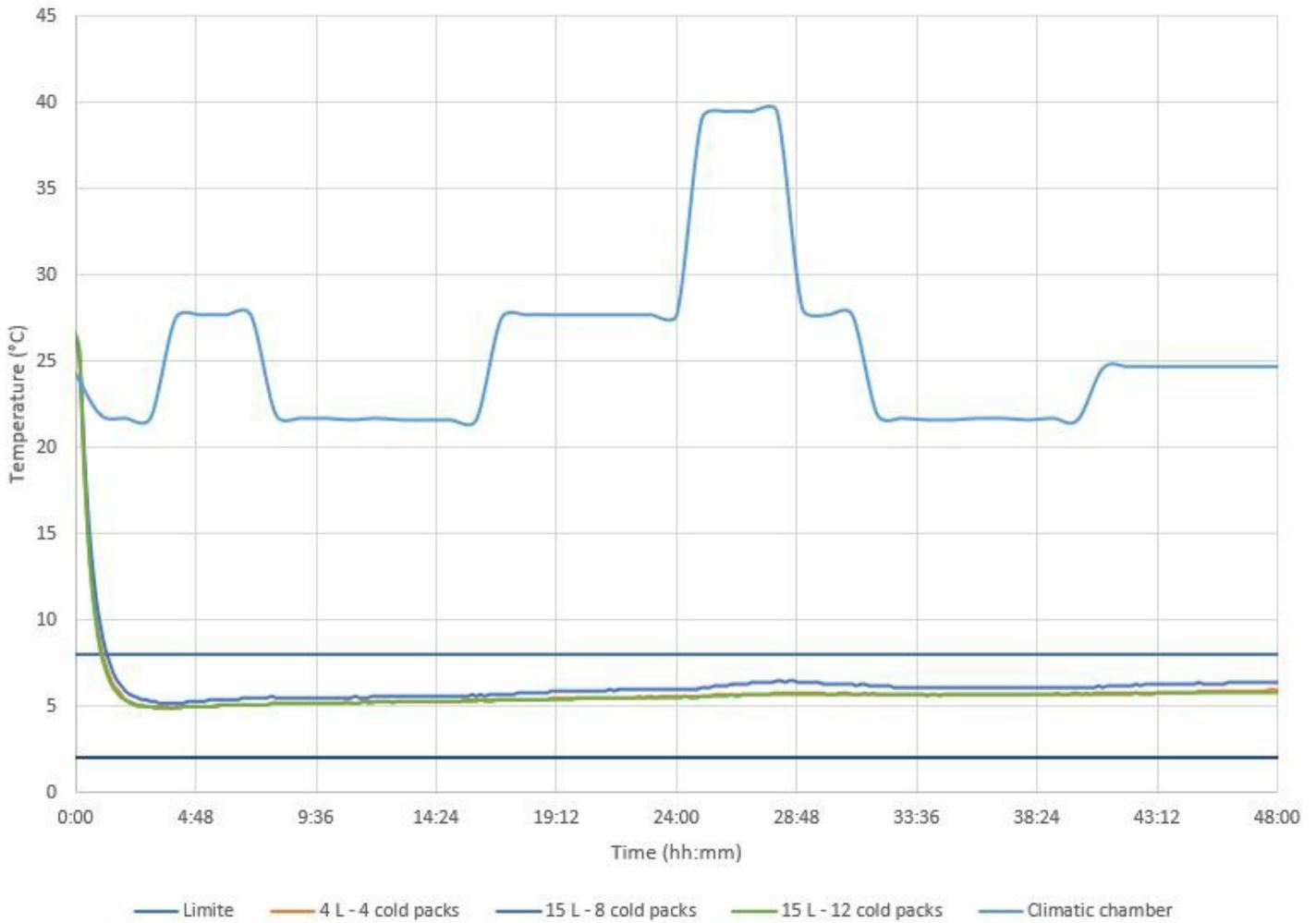
Contact : Zietek Marlon

Email : zma@bito.com

PO : PO0176124-05 du 18/07/2025

ANNEXE : 4 . 1 Conclusions
Summer recording

Summer profile



Company : BITOLagertechnik

Contact : Zietek Marlon

Email : zma@bito.com

PO : PO0176124-05 du 18/07/2025

ANNEXE : 4 . 2 Conclusions
Winter recording

Winter profile

