





**TECHNICAL SPECIFICATIONS FOR
LAMINATED TUBES & PLASTIC
CAPS**

Code	E.00.00001
Version	06
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Edited	Quality Technical Ramos Ander	
Revised	Technical Director CTL-TH Engineering Valpuesta Juan Ignacio	
Approved	Managing Director, Global Head of Innovation and Technology Fdz de Mendiola Javier	

Summary of modifications	<ul style="list-style-type: none"> • NG 211: Selection of raw materials • NG 212: Appearance test <ul style="list-style-type: none"> - New defects and specific details in the appearance of the tube and introduce a new definition of the frustoconical plugs of NOTE - 5 - Eliminate everything related to Dositube and Beautytube distribution pump tubes • NG 213: Dimensional check <ul style="list-style-type: none"> - Modify the Perpendicularity formula • NG 215: Seal Tightness Test → Eliminate everything related to Dositube and Beautytube distribution pump tubes • NG 216: Torque unscrewing → Enter in the values table the unscrewed values for Ø50 in the XS18 head • NG 217: Stress Cracking Test → Eliminate everything related to Dositube and Beautytube distribution pump • NG 226: Assembly strength test → Eliminate everything related to Dositube and Beautytube distribution pump • NG 230: Priming and dosage test for dispensing pumps → Delete standard • NG 232: Article cleanness test → Modify the table of results
Replace	E.00.00001 V05

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1. GENERAL CONDITIONS

1.1 Scope

The present list of technical specifications defines the contractual good quality framework concerning manufactured by the CTL-TH Packaging Group, representing a baseline for relations with our customers without affecting any particular written agreements that may be adopted as standard procedure and which will alter or modify the present terms.

At the beginning of a business relationship with the customer, the CTL-TH Packaging Group employs the following quality control procedures relating to the product:

1. Prior approval and signing of the customer's quality standards by the CTL-TH Packaging Group.
2. Should no signed agreements exist with regard to the customer's specific standards, or in case that some of the customer's quality norms do not contemplate some aspects, the present technical specifications for products manufactured by the CTL-TH Packaging Group will apply.

1.2 Commitments of the CTL-TH Packaging Group

The CTL-TH Packaging group is committed to:

- Respect the raw materials that are defined in the product technical data sheet CTL-TH Packaging group.
- Report changes of plans that may affect the functionality of the final product herein.
- Its goods do not contravene patents or any regulations regarding intellectual or commercial property rights.

The CTL-TH Packaging Group selects according to its own criteria the **suppliers** of items and raw materials, the **subcontractors** and **production means** as long as they comply with these technical specifications.

1.3 Storage conditions product

In following with ETMA (European Tube Manufacturers Association) guidelines the CTL-TH Packaging Group estimates that the shelf life of a laminated tube, as from the date of manufacture, is 12 months in the following conditions:

- Stored under normal temperature conditions (>10° C and < 35 ° C).
- In a dry place (between 40 and 60% humidity).
- In a dark place (protected against direct light).
- In a clean place free of contamination.

- Stacking the cartons containing the tubes does not involve crushing thereof.
- Preserved in the original packaging for the transport (pallets, boxes and stretch film).

Therefore no claim will be accepted once the time limit expires, or if the conditions above are not followed, whatever the date has passed or not, the conditions are not guaranteed.

2 QUALITY CONTROL REQUIREMENTS

This document describes the various General Standards used for quality control in the CTL-TH Packaging Group, for plastic tubes, caps and other components.

2.1 Conditions for trials

Application of each test and general standard described in this list of specifications will have to be carried out after a minimum of four hours following manufacture (except standard 129 which has to be done at least 48 hours after manufacture), leaving the tubes to settle for at least 12 hours at a temperature of between 18°C to 25°C.

2.2 Average Quality Levels

Product quality will be defined in terms of the results obtained from carrying out the methods described in the ISO 2859, with the following premises:

Batch (test batch): The total number of units manufactured by the CTL-TH Packaging Group under the same MO (manufacturing order) N° and/or shipment order will be considered as a batch.

The CTL-TH Packaging Group guarantees that the following Acceptable Quality will be applied:

GENERAL STANDARD	CHARACTERISTIC	A.Q.L
211	Raw materials	Not applicable. For information only
212	Appearance of plastic tubes	Cr 0,1 Ma 1 me 6,5
213	Dimensional	Cr 0,1 Ma 1 me 6,5
214	Resistance of decoration	Cr 0,65 Ma 2,5 me 10
215	Seal tightness	0,1
216	Torque unscrewing	1
217	Stress cracking	0,1
218	Head-body weld strength	0,1

219	Tube seal weld strength	0,1
220	Barcode reading	Cr 0,1 Ma 1
221	Tamper evidence force	1
222	Resistance to side seam	0,1
223	Copper sulphate contact	1
224	Packaging and labelling. Number of units	Not applicable. For information only
226	Assembly strength	1
229	Decoration-treatment strength of caps	Cr 0,65 Ma 2,5 me 10
231	Inter-tube sliding	1
232	Article cleanness	Cr 0,1 Ma 1 me 6,5
233	Weight tubes	See Standard

2.3 Special Requirements Control


1. In the case of items which are not manufactured by the CTL-TH Packaging Group and which form part of the final product, this document is not applicable. Standards and tolerances will be defined in the technical specifications of the CTL-TH Packaging's supplier. Those specifications might be requested by the client if necessary.

2. In the case of items requested, supplied, furnished or purchased by the final customer, the quality of the said items will be determined by any existing agreements between the said supplier and the final customer.

In these cases, the CTL-TH Packaging Group is not responsible for the quality of item.

It is absolutely crucial that the quality standards for such items be defined by the final customer before initial production starts.

3. In the case of printed labels, due to verification difficulties for the supplier (especially if no automatic detection or segregation system is used), as well as the reception inspection and process control at CTL-TH Packaging, there may be a randomly accumulated sub-batch of defective units (faulty and/or poorly defined printed material). This doesn't mean the rejection of the sub-lot. The decision of rejection will therefore be taken according to the total number of units for the manufacturing or shipping order and according to the AQL defined on the previous page.

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2.4 Non conformities management

All customer complaints or claims must be accompanied at least by:

- Samples of the nonconforming items
- Information regarding any tests done in order to qualitatively and quantitatively define the nonconformity.
- The traceability label(s) from the tray(s) in order to assist the CTL-TH Packaging Group in its investigations and analysis of the causes.

The absence of any of the requested items will make impossible investigation and corrective actions. As a consequence, customer will assume that the same no-quality issue might occur in further production runs.

The aforementioned information and samples will be passed on to our Commercial Service in order to initiate internal proceedings. The CTL-TH Packaging Group will provide the customer with an explanation of the causes and the corresponding actions.

Goods will not be returned before previous agreement between CTL-TH Packaging Group and the Customer.

2 CONTROL & DISTRIBUTION OF MODIFICATIONS MADE TO THIS DOCUMENT

The following specifications, the certificate for systems (like quality, environment, health and safety ...), the compromises and certificates for legal matters applicable to the CTL-TH Packaging Group (norms, laws ...) are available on our website www.tuboplastctl.com.

The latest modifications on this document are highlighted with a line on the margins.



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3 GENERAL NORMS (NG)

NG 211: SELECTION OF RAW MATERIAL

OBJECT

The purpose of this standard is define the methods of selection of raw materials

FIELD OF APPLICATION

This standard covers those raw materials used in the manufacture of tubes and caps that are in direct contact with the product contained therein as well as the lacquers.

OPERATING MODE

The CTL-TH Packaging Group employs various methods to establish agreements for defining the raw materials to be used in the manufacture of its articles:

A. Raw materials proposed by the customer


If the customer proposes us raw materials or send us an existing container wants to manufacture with the CTL-TH Packaging Group, the CTL-TH Packaging group analyzes the raw materials, if you differ from the already approved by the group, intends to raw materials approved equivalent.

Such alternatives must be validated and accepted by the customer. Therefore, the CTL-TH Packaging Group recommends the use of the system described in point B to check the compatibility of container - product of commodity raw materials selected

B. Raw materials proposed by the CTL-TH Packaging Group after carrying out the corresponding product-container compatibility test

The CTL-TH Packaging Group has the necessary means to carry out the product-container compatibly tests. To undertake these tests the customer must supply a sample of the product that will be contained in the tube. The corresponding tests will be carried out with the said sample and, based on the results; the CTL-TH Packaging Group will issue a formal proposal regarding the raw materials that it will be possible to use. In all cases, the customer must approve and confirm acceptance of the said proposal before production of the item can commence. Bearing in mind that the control on the contained product (bulk) is responsibility of the client.

Should the customer make slight modifications to the composition of a specific product, it is advisable to request the CTL-TH Packaging Group to carry out a new compatibility test, given that the previous results will not be considered valid for new product formulas.

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C. Stock breach

In case of raw material breach on the market, CTL-TH Packaging reserves the right to change to an alternative raw material previously homologated by the group without previous notification.

NG 212: APPEARANCE TEST

OBJECT

The purpose of this standard is to check the appearance (attributes) of tubes, caps and other components manufactured by the CTL-TH Packaging Group.

OPERATING MODE

The appearance test consists of visually inspecting the tubes and their components. The said inspection is carried out under bright well lit conditions.

DEFINITIONS

The quality of the product is checked against the conditions described in the ISO 2859.

LIST OF DEFECTS

The defects are considered and classify as following:

1. Critical defects are the ones that:

- Make dangerous the use of the article or the finished good.
- Make impossible the use of the article or the finished good for its purpose.
- Generate a legal no-conformity.

2. Major defects are the ones that:

- Reduce considerably the commercial value of the article or the finished good.
- Might reduce the use of the article or finished good.

3. Minors defects are the ones that slightly reduce the commercial value of the article or the finished good and that are not perceptible by the consumer.

APPEARANCE OF LAMINATED TUBES:

Appearance of laminated tubes	
CRITICAL	A.Q.L = 0,1
MAJOR	A.Q.L = 1
MINOR	A.Q.L = 6,5
ACCEPTABLE	

DEFECT CODE	DESCRIPTION OF DEFECT	SPECIFIC DETAILS	A.Q.L
<u>10</u>	<u>CAP DEFECTS</u>		
10.1	Broken cap, Missing or excess material	If it hinders air tightness - operation – use	0,1
		If defect visible at more than 40cm away for 5s	1
		If defect visible at less than 40cm and over 20cm away for 15s	6,5
10.2	Creased, deformed cap	If it hinders air tightness - operation – use	0,1
		If the defect is seen more than 40cm away for 5s	1
		If defect visible at less than 40cm and over 20cm away for 15s	6,5
10.3	Missing seal		0,1

DEFECT CODE	DESCRIPTION OF DEFECT	SPECIFIC DETAILS	A.Q.L
<u>10</u>	<u>CAP DEFECTS</u>		
10.4	Colour – Tone - Opacity (see note-4)	Out of colour card if exists	1
		If $\Delta E > 5$ in comparison with standard	1
		If ΔE is between 5 and 3 in comparison with standard	6,5
		If $\Delta E < 3$ in comparison with standard	Acceptable
10.5	Scratches, marks	If defect visible at more than 40cm away for 5s	1
		If defect visible at less than 40cm and over 20cm away for 15s	6,5
10.6	Sink marks	If defect visible at more than 40cm away for 5s	1
		If defect visible at less than 40cm and over 20cm away for 15s	6,5
10.7	External inclusions (burnt material, bursts, gels, unmolded material). (see note-2)	SEE ACCORDING TO THE TABLE DEFINED IN NG: 232 - CONTROL OF THE CLEANING OF ITEMS	
10.8	Internal inclusions (burnt material, bursts, gels, unmolded material). (see note-2)	SEE ACCORDING TO THE TABLE DEFINED IN NG: 232 - CONTROL OF THE CLEANING OF ITEMS	
10.9	Thread	Discontinuous thread	0,1
		Smudged thread	1
10.10	Rough edges	> 1mm	1
		> 0,5 to \leq 1mm	6,5
		\leq 0,5mm	Acceptable
10.11	Outside injection point	> 1mm with risk of injuring consumer	0,1
		> 1mm without risk of injuring consumer	6,5
		\leq 1mm	Acceptable

DEFECT CODE	DESCRIPTION OF DEFECT	SPECIFIC DETAILS	A.Q.L
<u>10</u>	<u>CAP DEFECTS</u>		
10.12	Inside injection point	Affects functionality	1
		Do not affect functionality	Acceptable
10.13	Stretched thread	If it hinders air tightness - operation – use	0,1
		> 1mm	1
		> 0,5 to ≤ 1mm	6,5
		≤ 0,5mm	Acceptable
10.14	Bursts / Gases / Air bubble	If necessary, limits to be defined with a range board.	Acceptable

DEFECT CODE	DESCRIPTION OF DEFECT	SPECIFIC DETAILS	A.Q.L
<u>20</u>	<u>DECORATION DEFECTS</u>		
20.1	Mixed references		0,1
20.2	Total absence of decoration on the tube		0,1
20.3	Legal text (countenance, composition, society name, ...)	Text missing	0,1
		Incomplete text intuitively unreadable	1
		Incomplete text intuitively readable	Acceptable

DEFECT CODE	DESCRIPTION OF DEFECT	SPECIFIC DETAILS		A.Q.L
<u>20</u>	<u>DECORATION DEFECTS</u>			
20.4	Aspect defects of decoration (badly defined, partial lacks of decoration, marks, scratch, dots, stripe, chicken eye, pore, ink running).	Main side	If defect visible at more than 40cm away for 5s	1
			If defect visible at less than 40cm and over 20cm away for 15s	6,5
		Posterior side	If defect visible at more than 40cm away for 5s	6,5
			If defect visible at less than 40cm and over 20cm away for 15s	Acceptable
20.5	Colour – tone (see note-4)	Out of colour card if exists		1
		If $\Delta E > 5$ in comparison with standard		1
		If ΔE is between 5 and 3 in comparison with standard		6,5
		If $\Delta E < 3$ in comparison with standard		Acceptable

DEFECT CODE	DESCRIPTION OF DEFECT	SPECIFIC DETAILS		A.Q.L
<u>30</u>	<u>VARNISH DEFECTS</u>			
30.1	Lack of varnish	Total absence		0,1
30.2	Wrong effect of the varnish	If defect visible at more than 40cm away for 5s		1
		If defect visible at less than 40cm and over 20cm away for 15s		6,5

DEFECT CODE	DESCRIPTION OF DEFECT	SPECIFIC DETAILS	A.Q.L
<u>30</u>	<u>VARNISH DEFECTS</u>		
30.3	Marks and scratches of the varnish	If defect visible at more than 40cm away for 5s	1
		If defect visible at less than 40cm and over 20cm away for 15s	6,5
30.4	Shiny-satin-mat effect	If necessary, limits to be defined with a range board	Acceptable

DEFECT CODE	DESCRIPTION OF DEFECT	SPECIFIC DETAILS	A.Q.L
<u>40</u>	<u>CONFORMING DEFECTS (SLEEVE)</u>		
40.1	Sleeve broken, with wrong material, missing material, deformed or pierced.	If it hinders operation – use	0,1
		If it only affects machinability	1
		If it only affects the aesthetics	6,5
40.2	External inclusions (burnt material, bursts, gels, unmolded material). (see note-2)	SEE ACCORDING TO THE TABLE DEFINED IN NG: 232 - CONTROL OF THE CLEANING OF ITEMS	
40.3	Internal inclusions (burnt material, bursts, gels, unmolded material). (see note-2)	SEE ACCORDING TO THE TABLE DEFINED IN NG: 232 - CONTROL OF THE CLEANING OF ITEMS	
40.4	Other defects on the tube skirt (creases, marks, lines, dots, dirt, etc.).	If defect visible at more than 40cm away for 5s	1
		If defect visible at less than 40cm and over 20cm away for 15s	6,5
40.5	Rough edges – irregularities on the end cut of the tube	Affects filling	1
		Affect aspect of the filled product	6,5
		Do not affect the aspect of the filled product	Acceptable

DEFECT CODE	DESCRIPTION OF DEFECT	SPECIFIC DETAILS	A.Q.L
<u>40</u>	<u>CONFORMING DEFECTS (SLEEVE)</u>		
40.6	Colour – Tone - Opacity (see note-4)	Wrong colour	0,1
		If $\Delta E > 5$ in comparison with standard	1
		If ΔE is between 5 and 3 in comparison with standard	6,5
		If $\Delta E < 3$ in comparison with standard	Acceptable
40.7	Small marks, undulation, deformations on the side seam		Acceptable

DEFECT CODE	DESCRIPTION OF DEFECT	SPECIFIC DETAILS	A.Q.L
<u>50</u>	<u>INJECTION/MOULDING OF HEAD-SLEEVE DEFECTS</u>		
50.1	Rough edges – marks on joint between head/body	> 1mm	1
		> 0,5 to \leq 1mm	6,5
		\leq 0,5mm	Acceptable
50.2	Defects and deformations on the head of the tube	If it effects air tightness	0,1
		If defect visible at more than 40cm away for 5s	1
		If defect visible at less than 40cm and over 20cm away for 15s	6,5
50.3	No opening (product outlet) on tube		0,1
50.4	Collar	If defect visible at more than 40cm away for 5s	1

DEFECT CODE	DESCRIPTION OF DEFECT	SPECIFIC DETAILS	A.Q.L
<u>50</u>	<u>INJECTION/MOULDING OF HEAD-SLEEVE DEFECTS</u>		
		If defect visible at less than 40cm and over 20cm away for 15s	6,5
50.5	Thread	Discontinuous thread	0,1
		Smudged thread	1
50.6	Head's colour (see note-4)	Wrong colour	0,1
		If $\Delta E > 5$ in comparison with standard	1
		If ΔE is between 5 and 3 in comparison with standard	6,5
		If $\Delta E < 3$ in comparison with standard	Acceptable
50.7	Beaded (union body and head)	Low (affects sealing)	0,1
		If defect visible at more than 40cm away for 5s	1
		If defect visible at less than 40cm and over 20cm away for 15s	6,5
50.8	Injection "tears"	If defect visible at more than 40cm away for 5s	1
		If defect visible at less than 40cm and over 20cm away for 15s	6,5
50.9	External inclusions (burnt material, bursts, gels, unmolded material). (see note-2)	SEE ACCORDING TO THE TABLE DEFINED IN NG: 232 - CONTROL OF THE CLEANING OF ITEMS	
50.10	Internal inclusions (burnt material, bursts, gels, unmolded material). (see note-2)	SEE ACCORDING TO THE TABLE DEFINED IN NG: 232 - CONTROL OF THE CLEANING OF ITEMS	
50.11	Small marks, undulation, deformations on the head-sleeve seal		Acceptable
	Stretched thread	If it hinders air tightness - operation – use	0,1

DEFECT CODE	DESCRIPTION OF DEFECT	SPECIFIC DETAILS	A.Q.L
<u>50</u>	<u>INJECTION/MOULDING OF HEAD-SLEEVE DEFECTS</u>		
50.12		> 1mm	1
		> 0,5 to ≤ 1mm	6,5
		≤ 0,5mm	Acceptable

DEFECT CODE	DESCRIPTION OF DEFECT	SPECIFIC DETAILS	A.Q.L	
<u>60</u>	<u>TAMPER EVIDENCE DEFECTS</u>			
60.1	Tamper evidence position	Tamper evidence missing	0,1	
		perforated seal (with leakage to water or compressed air at 0.5 bar)	0,1	
		Safe seal out of center or partially detached with perforation uncovered	1	
		Safe seal out of center or partially detached with perforation covered	Acceptable	
60.2	Burnt or scratched	If defect visible at more than 40cm away for 5s	1	
		If defect visible at less than 40cm and over 20cm away for 15s	6,5	
60.3	Broken tab	Makes difficult to remove tamper evidence	1	
		Do not make difficult to remove tamper evidence	6,5	
60.4	Delamination	Total absence	Affects functionality	0,1
		Partial absence	Others	6,5
			Small threads	Acceptable

DEFECT CODE	DESCRIPTION OF DEFECT	SPECIFIC DETAILS	A.Q.L
<u>70</u>	<u>CAPPING DEFECTS</u>		
70.1	Cap missing		0,1
70.2	Broken cap	If it hinders air tightness - operation – use	0,1
		If defect visible at more than 40cm away for 5s	1
		If defect visible at less than 40cm and over 20cm away for 15s	6,5
70.3	Creased, deformed cap	If it hinders air tightness - operation – use	0,1
		If defect visible at more than 40cm away for 5s	1
		If defect visible at less than 40cm and over 20cm away for 15s	6,5
70.4	Twisted cap	If it hinders air tightness - operation – use	0,1
		If defect visible at more than 40cm away for 5s	1
		If defect visible at less than 40cm and over 20cm away for 15s	6,5
70.5	Reference mix of caps		1
70.6	Space between tube and cap (see note-5)	> 2mm	1
		> 1 to ≤ 2mm	6,5
		≤ 1mm	Acceptable

NOTE-1: *THE GREEN COLOUR REPRESENT SUBJECTIVE CRITERIAL.* The definition of appearance defects is for guideline purposes only. Major and minor defects can be classified and defined with the aid of a quality range-board card.

The above list of defects may be modified, both qualitatively and quantitatively, subject to agreement between customer/supplier, to accommodate any characteristics that are deemed necessary, such as the product to be contained, specific standards from the customer, level of difficulty in the production process, type of printing, materials used, etc.

NOTE-2: There are a series of gels, particles or remnants that pertain to the polymeric materials used that mainly affect the application of the printing inks, possibly causing printing faults as described by our suppliers of materials but at a percentage of less than 15% of units per order. These will not be considered as a fault as long as it does not interfere with the functionality of the container.

NOTE-4: The colour model used to measure the Delta E is the **CIE L*a*b* (CIELAB)**. The Delta E results do not apply in case of pearly or metallic effects.

NOTE-5: Except the assembly tube-cap formed by the conical caps like:

- TRUNCATED CONE CAP THREAD XS18 (S13) (STRANDED)
- 13.18 / 01C / TRUNCATED CONE CAP THREAD XS18 (S13) (STRANDED)
- TRUNCATED CONE CAP THREAD XS18 (S13) (STRANDED)
- FLIPTOP CAP Ø16 THREAD XS18 (S13) (STRANDED)
- SCREW ON CAP Ø22 XS18 (S13) (GLOSS)

NG 213: DIMENSIONAL CHECK

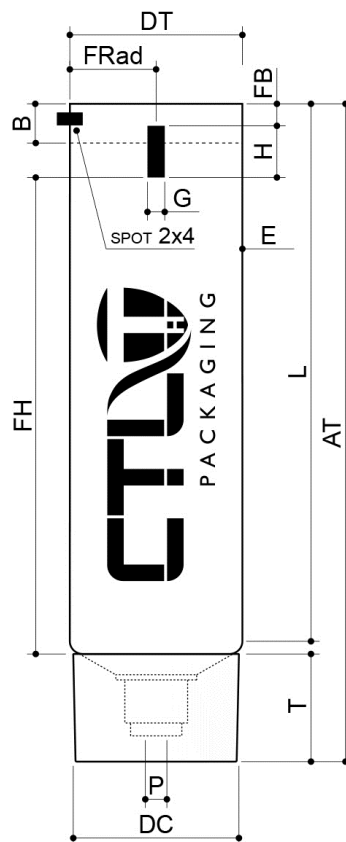
OBJECT

The purpose of this standard is to determine the measurements and tolerances of laminated tubes, plastic caps and other components manufactured by the T.H. Group against their functional dimensions

Functional dimensions are those that allow the finished product to be used, designed and handled without causing problems for either the manufacturer or the customer. These dimensions can be classified as:

- Dimensions that guarantee the seal integrity of the container
- Dimensions that allow the product to be processed without problems in dosing and sealing machines.
- Dimensions that guarantee the correct use of the product.

DIMENSIONAL SKETCH



X: Thickness of side seam (mm)

Figure 1: Dimensional sketch for a laminated tube

ADMISSIBLE TOLERANCES

AT: Total height.

L: Sleeve length of tube.

	TOLERANCES (mm)
AT (mm)	±1,5
L (mm)	

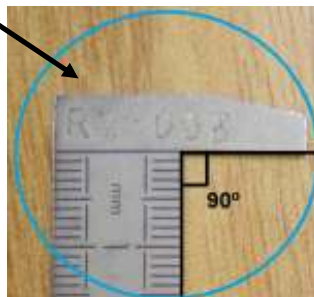
To check the total height (AT) of the tube, 2 methods can be uses:

- With a ruler.
- With a vertical gauge.

• **OPERATING MODE**

To check the conformity of the total height of the tube (AT) **with a ruler**:

1. Take a ruler with an angle of 90°.
2. Put the ruler on the surface of the cap and measure until the end of the sleeve of the tube.



To check the conformity of the total height of the tube (AT) with the **vertical gauge**:

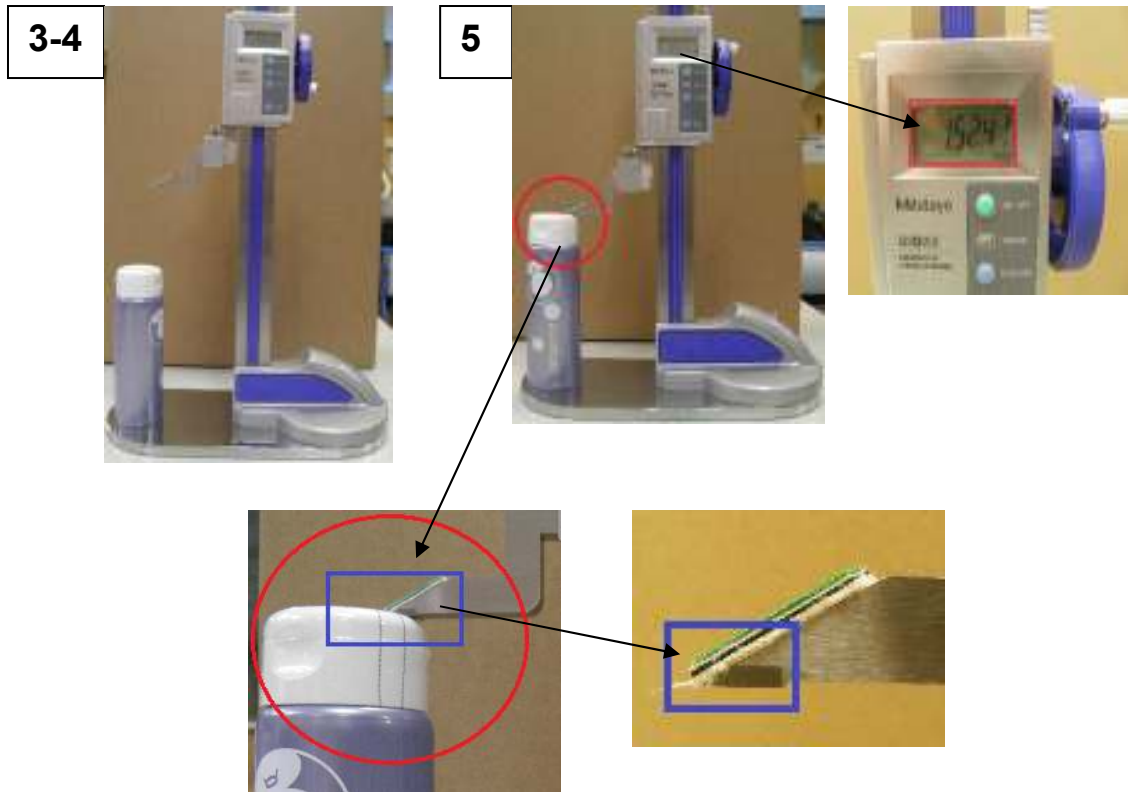
1. Take the vertical gauge as shown below.



2. Set the device to "0", supporting the flange on the surface where the tube will be supported.

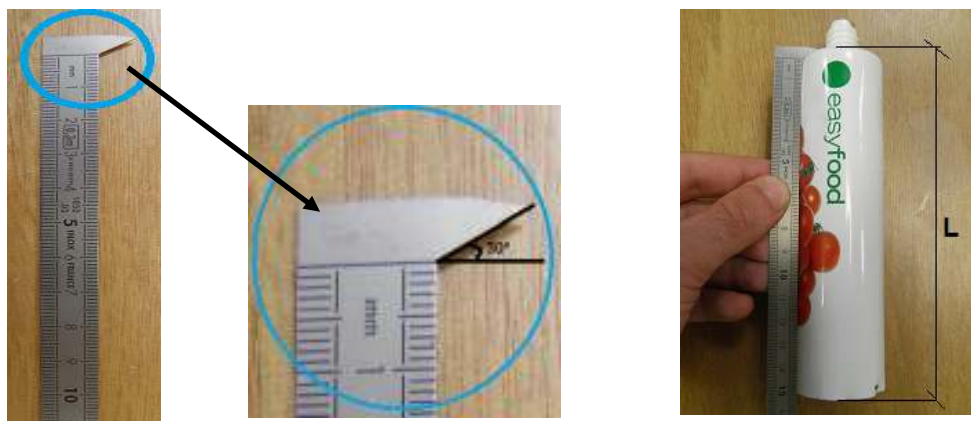


3. Lift the flange with the height regulator for measurement.
4. Support the tube on the base on a flat surface (marble, glass, plate ...) to avoid irregularities in the positioning of the tube and in the measure.
5. Lower the flange with the height regulator up to the highest point of the cap, supporting the planar area of the flange (the polished area of the flange) and measure.



To check the conformity of the length sleeve of the tube (L):

1. Take the ruler with an angle of 30° (respect to the horizontal).
2. Put the ruler on the shoulder of the tube and measure until the end of the sleeve of the tube.



DT: Outer diameter of the tube (in mm).

Dt: Inner diameter of the tube (in mm).

DIAMETERS (mm)			TOLERANCES (mm)
\varnothing nominal	\varnothing outer	\varnothing inner	
$\varnothing 22$	$\varnothing 22$	$\varnothing 21,3$	$\pm 0,2$
$\varnothing 25$	$\varnothing 25$	$\varnothing 24,3$	
$\varnothing 28$	$\varnothing 28$	$\varnothing 27,3$	
$\varnothing 30$	$\varnothing 30$	$\varnothing 29,3$	
$\varnothing 32$	$\varnothing 32$	$\varnothing 31,3$	
$\varnothing 35$	$\varnothing 35$	$\varnothing 34,3$	
$\varnothing 40$	$\varnothing 40$	$\varnothing 39,3$	
$\varnothing 50$	$\varnothing 50$	$\varnothing 49,3$	

The diameter check is made by using a calibrated mandrel, with the maximum tolerance for the inner diameter and a ring for measuring the maximum tolerance of the outer diameter. These must comply with the values described in the table above.

Example for 28 mm diameter tube:

- \varnothing Inner for test mandrel. 27.1 mm
- \varnothing Outer for ring: 28.2 mm

• **OPERATING MODE**

To check the conformity of the internal (Dt) and external diameter of the tube:

1. Select the gage corresponding to the theoretical internal diameter.
2. Select the gage (ring) corresponding to the theoretical external diameter.
3. Check if the tube slides on the calibre without forcing.
4. Once the tube is introduced in the internal diameter calibre, move the ring alongside the tube and check that the ring slides without forcing.



E: Thickness of the tube.

Type of product	Nominal Value (in microns)	Tolerances (in microns)
COMPLEX LAMINATE WITH ALUMINIUM	250	±25
	275	±27,5
	310	±31
	320	±32
COMPLEX LAMINATE WITHOUT ALUMINIUM	275	±27,5
	300	±30

X: Side seam

Measurement of the side seam is done by measuring the thicknesses of the complex laminate on either side of the seam and then adding the two measurements. Next, the thickness of the seam itself is measured. The value obtained is subtracted from the first sum. The result should be:

- $0.18 \text{ mm} \geq x \geq 0.04 \text{ mm}$

The result of this operation gives us the level of compression produced by the weld.

$$X1 + X2 - X3 = L$$

X1: Thickness measured on one side of the weld

X2: Thickness measured on the other side of the weld

X3: Thickness measured on the weld

L: Result of the compression lateral seam.



X1



X2



X3

Example:

- **X1:** 0,275 mm
- **X2:** 0,275 mm
- **Added total (X1+X2):** 0,275 + 0,275 mm = 0,55 mm
- **X3:** 0,44 mm
- **L:** 0,55 – 0,44 = 0,11 mm compression.

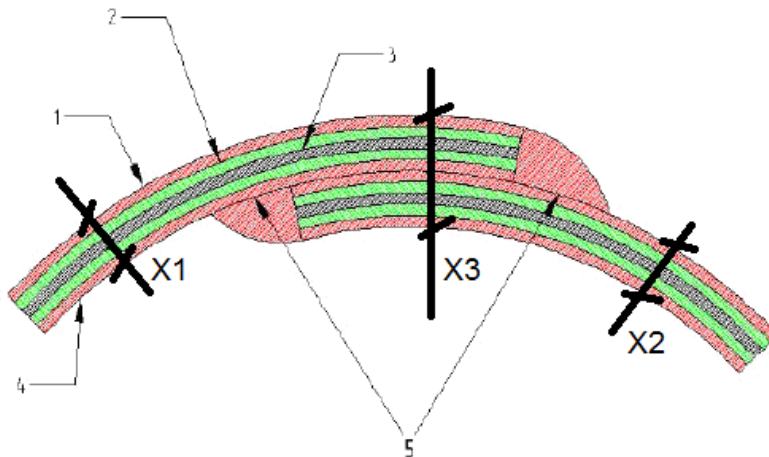



Figure 2: Side seam.

- 1 External layer
- 2 Adhesive
- 3 Barrier
- 4 Inner layer
- 5 Overlap

P: Perforated outlet opening for the product.

Type of product	Admissible tolerance (mm)
<p><u>Laminated tube</u></p> 	<p>±0.25 for those holes that correspond to product outlet for tubes.</p>

• **OPERATING MODE**

To check the conformity of the perforation of the orifice (P):

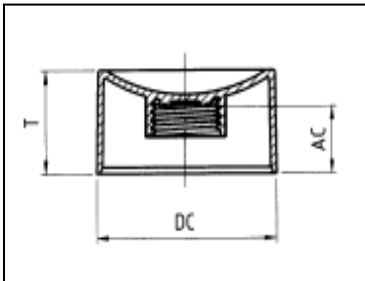
1. Select the gauge corresponding to the perforation of the theoretical orifice of the tube.
2. Check if the perforation of the orifice sliding the Pass-No pass gauge through the orifice.



DC: Cap diameter.

T: Cap height.

AC: Closing height of cap.

Type of product		Nominal Value (mm)	Tolerances (mm)
<p><u>PLASTIC CAPS</u></p> 	Cap diameter	Ø Cap ≤ 30	± 0,3
		Ø Cap > 30	± 0,4
	Cap height	Ø Cap ≤ 30	± 0,3
		Ø Cap > 30	± 0,4
	Closing height of cap	According to plan	±0,3

- **OPERATING MODE**

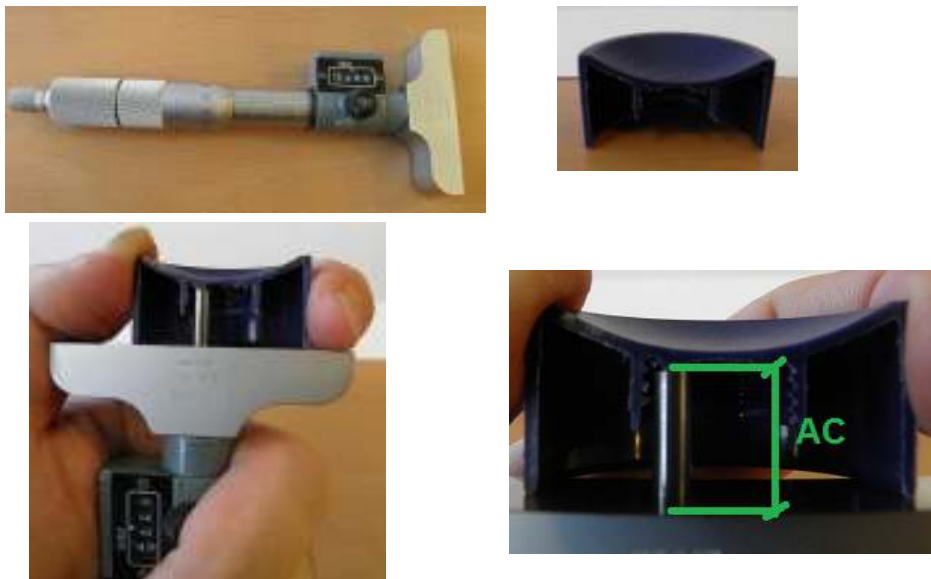
To check the conformity of the diameter (DC) and height (T) of the cap:

1. Use the calliper.
2. Measure the diameter and height of the cap respectively.



To check the conformity of the closing height cap (AC):

1. Take the “depth” micrometer and place it at the base of the cap.
2. Turn the micrometer manually until the pin touches the area where the cap leans on.
3. Check the measure (AC) when the pin reaches on the thread of the cap.

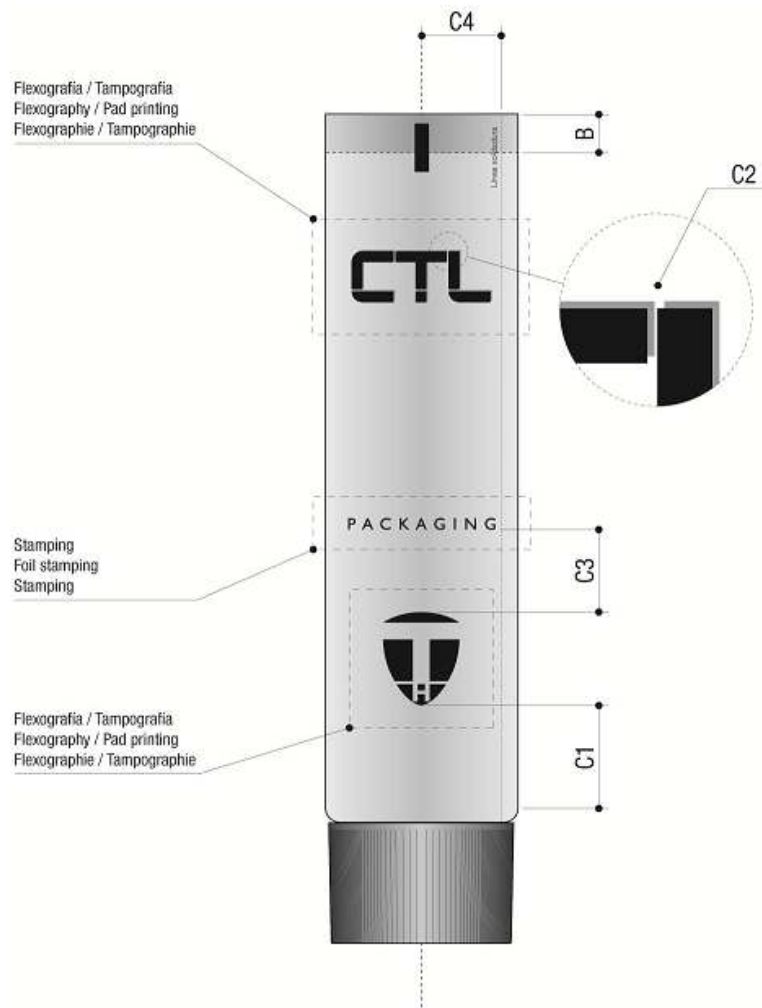


C: Print position.

B: Unlacquered area.

Variables to control	Tolerances (mm)
Print position to base or shoulder (C1)	± 1 with regard to specified value
Positioning between inks (overlapped inks or not) (C2)*	$\pm 0,3$
Position between stamping and printing (C3)	$\pm 0,8$ radial $\pm 0,5$ longitudinal
Position between the eyemark and the side seam (C4)	± 1
Unlacquered area (B)	± 1 with regard to specified value

*With certain decoration layouts, overlapping may occur between colours or, in the opposite case, a slight gap between them.



DEFORMATIONS:

Ovality

The following table shows in percentage (%) the complementary to the diameter size relative to the nominal size of the external diameter of the tube.

Type of product	Tolerances
Laminated tubes	10% of the outer diameter

- **OPERATING MODE**

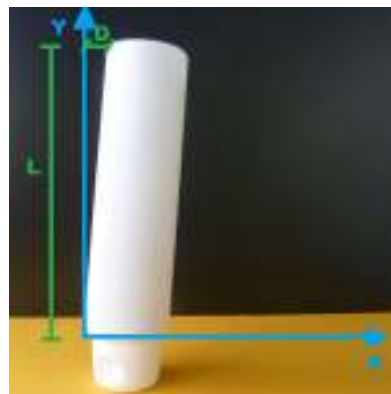
To check the conformity of the tubes when they suffer deformation:


1. Select the calibre corresponding to the theoretical external diameter.
2. Check if tubes Pass-No pass by letting it slide by itself inside the gauge.
3. Check if the tube slides without forcing it, by itself.



Perpendicularity:

$$\frac{D}{L} \leq 2\%$$



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The results of each of the characteristics mentioned in NG - 213 norm and dimensionally controlled are categorized as follows:

DESCRIPTION OF DEFECT	SPECIFIC DETAILS	A.Q.L
Dimensional control	If out of tolerance and prevents the use or functionality	0,1
	If out of tolerance but does not prevent the use or functionality	1
	If only affects the appearance preventing use or functionality.	6,5

General Note:

The said tolerances are applicable to products manufactured by the CTL-TH Packaging Group. In the case of outsourced components (eg caps) requested and/or supplied by the customer, the dimensions or characteristics in question will be defined and agreed at the beginning of production.

There are illustrative drawings available for each component manufactured by the CTL-TH Packaging Group that can be added to the technical specifications. These define the main characteristics for the purposes of Quality Control. The remaining measurements are provided for information purposes only.

The dimensions and tolerances, in the case of non-cylindrical geometries, which are not included in this standard are stated on the corresponding drawings for the product.

NG 214: RESISTANCE TEST FOR TUBE DECORATIONS

OBJECT

The purpose of this standard is to determine the durability of the decoration on a tube when subjected to various tests.

TESTS:

The following tests form part of this standard:

- **Decoration adherence test using adhesive tape**
- **Dry rubbing test of the decoration.**
- **Water resistance test of the decoration.**

ADHERENCE TEST USING ADHESIVE TAPE

• **Material:**

The material employed in this test includes:

- An adhesive tape (scotch) with an adhesion strength of 350 to 450 CN/Cm² (e.g. Ref. 616, 3M or similar).
- An adhesive tape (scotch), (e.g. Ref.: 810, 3M or similar).
- Chronometer.
- Samples of finished plastic tubes with caps fitted.

• **Operating mode:**

For all the decorations that may appear in a tube, except for hot-foil stamping the paper 3M tape, Ref: 616 (or similar) is used.

For hot-foil stamping, according to the hot-foil used for manufacturing the tube, the assay is performed with different adhesive tape (Scotch):

- **ADHESIVE TAPE 3M, REF. 616:** Adhesive tape used for standard hot-foil homologated and with alternative foil (shiny gold, mat gold, shiny silver, mat silver).
- **ADHESIVE TAPE 3M, REF. 810:** Adhesive tape used for specific hot-foil and customer hot-foil (copper, colour, ...).

- 1- A strip of Scotch tape, 6 cm long, is affixed along the main axis of the tube over the printed surface.
- 2- Press manually along the entire length of the decoration. It is very important that there is full contact between the surface of the tape and the entire area where it sticks, so that there is no air bubbles between the tape and the sample surface.
- 3- The time between affixing the adhesive tape and its removal should be no more than 1 minute (\pm 5 sec).
- 4- The tape is then pulled at one end to remove it quickly and abruptly, with an angle of 45°C.



Tubes manufactured with transfer printing over stamping will be exempt from this test (is not applied).

• **Results:**

The test is considered conform if none of the decorated elements are transferred to the adhesive tape (no lack of printing or coating, no loosening of varnishes, no attenuation of colours, not shown transfers print on the tape, no signs of deterioration or strips in the printing).

DRY RUBBING TEST

• **Material:**

The material employed in this test includes:

- Samples of finished plastic tubes with caps fitted.

• **Operating mode:**

- 1- The samples are taken in pairs and placed opposite each other along their side axes.
- 2- Sliding one across the other, backwards and forwards in an axial direction, five times.



This test is only valid for tubes with offset printing and shiny lacquer finished. Those decoration elements that are not coated by the lacquer finish are not included in this test.

• **Results:**

The test is considered conform if no wear is detected on the printed area or none of the decoration elements are transferred from one product to the other.

WATER RESISTANCE TEST

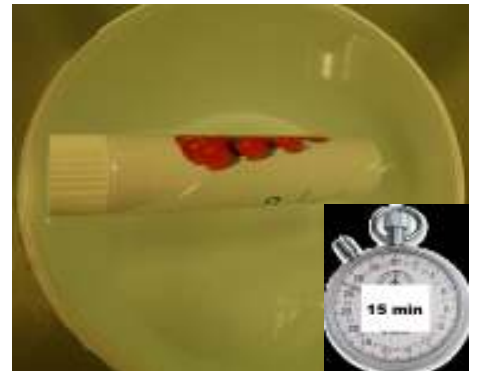
• **Material:**

The material employed in this test includes:

- Water at a temperature of 25°C
- Samples of finished plastic tubes with caps fitted.
- Cotton.
- Chronometer.

• **Operating mode:**

- 1- The samples are immersed in water at a temperature of 25°C \pm 3°C for 15 minutes (\pm 1 minute).



- 2- The printed surface of the samples is then rubbed with cotton.

• **Results:**

The tests are considered conform if no wear is detected on the printed surface.

The different decoration's defects will be classified as follows:

DESCRIPTION OF DEFECT	SPECIFIC DETAILS	A.Q.L
Tube decoration	Legal text Missing Full text o decoration missing.	0,65
	If defect visible at more than 40cm away for 5s Incomplete text, intuitively unreadable.	2,5
	If defect visible at less than 40cm and over 20cm away for 15s	10
	Small lacks Incomplete text, intuitively unreadable.	Acceptable

NOTE: For decorative elements that are not printed on the varnish and that are not protected by the varnish, the decoration might not meet the requirements of the method NG-114.

The customer bears the consequences in the event that the decoration does NOT meet the above condition concerning the protection.

Example:

A clear example is the section of the photocell NOT covered by the varnish.

Generally, during transport, the tubes suffer friction between them, vibrations ..., which can generate:

- Risk of ink dirtiness.
- Risk of blur of the decoration.
- Risk of non-adherence of the decoration.

NG 215: SEAL TIGHTNESS TEST

OBJECT

The purpose of this standard is to check the seal tightness of the tube-cap assembly, both with and without tamper evidence, in relation to the product being contained.

TESTS:

The following tests form part of this standard:

- **Tube with cap:**
 - *Tube without tamper evidence*
 - *Tube with tamper evidence*

TUBES WITH CAP:

• **Material:**

The material employed in this test includes:

- Truncated cone adapter.
- Compressed air supply equipped with a pressure regulator (0.5 bar).
- Vessel containing water.
- Samples of finished plastic tubes with caps fitted.
- Chronometer.

• **Operating mode:**

Tube without tamper evidence

- 1- The tube-cap assembly is placed into the vessel of water, ensuring that cap is completely immersed.
- 2- There is a certain amount of air trapped between the cap and the shoulder, that must be removed before the test begins. This air tends to escape suddenly, so allowances should be made for this when doing the test.




- 3- Once it is certain that there is no air escaping, the truncated cone adapter is inserted onto the outlet of the compressed air supply.
- 4- This pressure is then set to 0.5 bar ($\pm 0,05$ bar) for 10 seconds (± 1 sec).

Tube with tamper evidence

- 1- Firstly, the same test as described before is done with both the tamper evidence and the cap.
- 2- Secondly, the tamper evidence is removed.
- 3- Then the cap is screwed on at the minimum torque setting, defined in the table in standard 216, with an additional 1 kpxcm*.
- 4- Finally, the same trial is done again without the tamper evidence and with the cap...



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* This sum is applied to cylindrical tubes, with the exception of elliptical tubes as a different system is employed to insure tightness. In this case the torque values are given in Standard 216.

NOTE: The tamper evidence without a cap does not guarantee the seal tightness of the tube.

• **Results:**

The test is considered conform if there is no continuous stream of air bubbles from the moment that the compressed air is introduced inside the tube.

NG 216: TORQUE UNSCREWING

OBJECT

The purpose of this standard is to determine the unscrewing values for the cap with respect to the head of the tube, to guarantee use of the item by the customer.

Those tube-cap designs where the unscrewing torque does not determine the seal tightness of the assembly are not subject to this standard; instead standard NG 215 “seal tightness” is applicable.

MATERIAL

The material employed in this test includes:

- Torque meter
- Samples of finished plastic tubes with caps fitted.
- Chuck.

OPERATING MODE

1- A chuck is fitted into the torque meter and a tube is placed so that it is attached to the appliance.



2- The value is set to zero.

3- The unscrewing operation is done by manually unscrewing the cap, in a continuous way and without blows.

RESULTS

Special attention should be paid to transportation, storage conditions and time between manufacture and testing any of these factors could alter the particular characteristics being tested.

Values have been established for each tube-cap assembly (based on diameter and head). This is why values lower than those specified may occasionally be detected, depending on the seal tightness obtained (tubes with tamper evidence, highly viscous products, etc.) and the cap is never removed until the moment of use.

The standard does not apply to tubes with a set opening torque (elliptical tubes).

The test is considered conform if values are inside tolerances defined in the following table.

TABLE OF UNSCREWING VALUES (kgf x cm)					
<u>Laminated Tubes</u>					
Cabeza	XS18	M11	M15	M17	M17/01
Ø22	1 6				
Ø25	1 6	1 6			
Ø28	1 6				
Ø30	1 6		2 10		
Ø32	1 6				
Ø35	1 6		2 10		
Ø40			2 10	2 10	2 10
Ø50	1 6				

NG 217: STRESS CRACKING TEST

OBJECT

The purpose of this standard is to determine the tube's resistance to stress cracking.

TESTS

The following tests form part of this standard:

- **Stress cracking test of the head-shoulder seal**
- **Stress cracking test of the sleeve's seal.**

MATERIAL

The material employed in this test includes:

- A surfactant solution (eg TRIDECYL ETHER (TRIDECETH-12)) at $0.5\% \pm 0.05\%$ in demineralized water.
- Samples of finished plastic tubes with caps fitted.
- Hot air sealing machine.
- Drying oven (at 55°C).
- Chronometer.
- Vessel.

OPERATING MODE

- 1- Half of the samples are coated both externally (covering the cap completely) and internally (up to half their capacity) with the solution.





- 2- Fill in the rest of the tube with the solution (until the half of the capacity) and seal the base of the tube according to method NG 219

Put the tubes upside-down so that the seal is in contact with the solution.

Do **not** immerse the outside of the seal in contact with the solution.

- 3- The prepared products are placed inside a drying oven at $55^{\circ}\text{C} \pm 2^{\circ}\text{C}$ for 24 hours ± 1 hour.



Note: The solution must not be reused after it has been tested in the oven.

RESULTS

For the assembly tube-cap, the test is considered conform if, on later inspection, none of the material shows any signs of cracking. The seals should also be in good condition, with no signs of cracking.

NG 218: HEAD BODY WELD STRENGTH TEST

OBJECT

The purpose of this standard is to determine the strength of the head/body welded joint on tubes.

MATERIAL

The material employed in this test includes:

- Samples of plastic tube without caps
- Safety knife for cutting the tube.

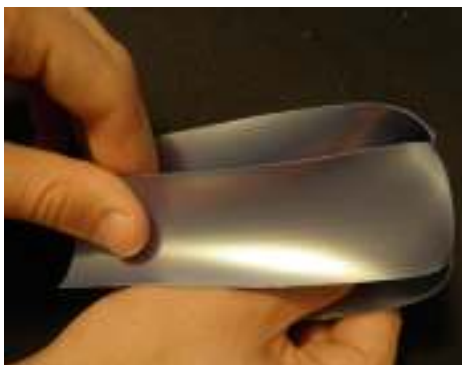
OPERATING MODE

1- Take a sample capless tube. Then cut the tube in the following way:

• $\varnothing < 40\text{mm}$ → 2 cuts



• $\varnothing \geq 40\text{mm}$ → 3 cuts



2- Bend the body of the tube outward up to the head so that the inner part is visible. Later pull manually between the head and the body of the tube using the thumb (trying to pull the visible head/body weld seam apart).

A second test is done afterwards, with capless sample tubes, using the thumb to apply an inward force on the head/body joint.



RESULTS

The test is considered conform if the head/body joint does not come apart during the test.

NG 219: TUBE SEAL WELD STRENGTH TEST

OBJECT

The purpose of this standard is to determine the strength of the tube seal weld.

MATERIAL

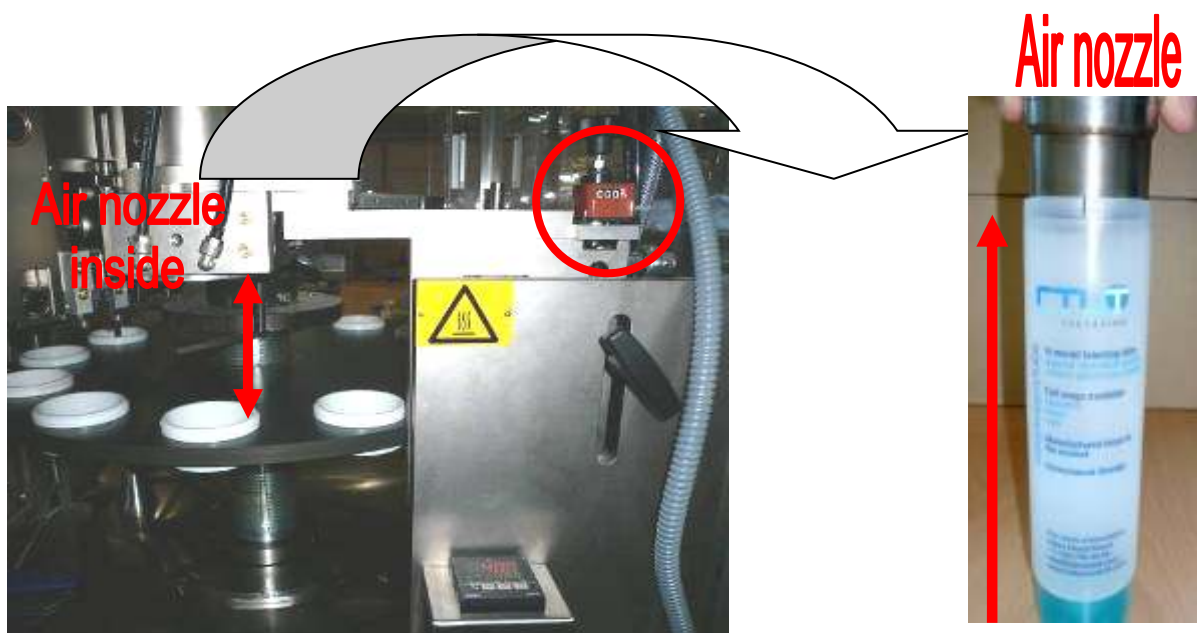
The material employed in this test includes:

- Hot air sealing machine.
- Samples of finished tubes.
- Air pressure (3 bar).
- Truncated cone adapter.
- Chronometer.

OPERATING MODE

Before performing this test, it is important to check the cleanliness of the inner area of the weld. Indeed, a dirty area can generate a false interpretation of the result.

- 1- Seal the samples at the base using the sealing machine.





2- Then pump air inside the tube for 10 seconds (± 5 sec) to the pressure define in the following table

Type of product	\varnothing Nominal (cm)	Complex thickness (μm)	Pressure(bar)
Complex laminate <i>with</i> aluminium	≤ 40	≥ 250	2.0
	> 40	≥ 250	1.8
Complex laminate <i>without</i> aluminium	≤ 40	< 250	1.5
	> 40	< 250	1.5

NOTA: The CTL-TH Packaging Group can provide to the customer some recommendations for sealing with hot air in its guide “X.00.00009 – Recommendation– Hot Air Sealing”.

RESULTS

The test is considered conform if the weld withstands the test without yielding.

NG 220: BARCODE READING TEST

OBJECT

The purpose of this standard is to determine the integrity of the barcode printed on the product by means of a barcode reading.

MATERIAL

The material employed in this test includes:

- Appliances from the QUICK-CHECK and AXICON range, these will provide the reading

OPERATING MODE


Read the barcode with the device.

RESULTS

The test is considered conform if the number read is the same as the barcode impressed.

The classification of non-conform results will be achieved in the following manner:

DESCRIPTION OF DEFECT	SPECIFIC DETAILS	A.Q.L
The barcode read is different from the one on the product (number under the barcode).		0,1
The barcode is not read or is difficult to read.		1

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NOTE

Bar code reading may be influenced by different aspects such as:

- The contrast between the colour of the barcode and the base on which it is printed.
- The size, layout, margins, cut-off, gain / widening, etc., of the code.
- The type of print method used for the code (Offset, transfer, stamping), etc.
- The possible influence of the product being contained (transparent, translucent tubes) etc.

Due to the numerous variables that may influence the integrity of the barcode, the customer must make one last reading before launching the product by way of a final check.

The influence of the product being contained (in natural or semi-natural tubes) is subject to testing before it is launched by the customer.

NG 221: TAMPER EVIDENCE FORCE TEST

OBJECT

The purpose of this standard is to measure the joint strength between the tamper evidence and the head of the tube.

MATERIAL

The material employed in this test includes:

- Dynamometer set at an established range between 0 and 5 kgf.
- Tubes with tamper evidence.



OPERATING MODE

- 1- Proceed with the separation by pulling the tamper evidence steadily in an upward direction along the longitudinal axis of the tube.



RESULTS

The test is considered conform if values are inside tolerances defined in the following table:

TAMPER EVIDENCE	MINIMUM (Kgf.)	MAXIMUM (Kgf.)
All	0.1	1.5

NG 222: RESISTANCE OF THE SIDE SEAM

OBJECT

The purpose of this standard is to determine the laminated tube's resistance of the side seam.

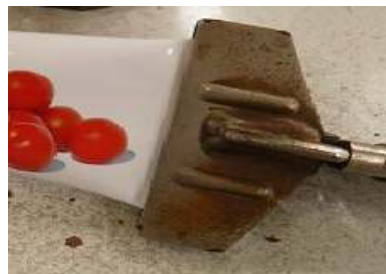
MATERIAL

The material employed in this test includes:

- Air pressure machine.
- Tip according to head
- Finished laminated complex tubes not sealed at the base and without caps

OPERATING MODE

- 1- Fold the sleeve at the base of the tube; apply pressure to the fold with the help of the pliers while avoiding the loss of air inside.



- 2- Adjust the head tube to the machine using the tip adapted for this purpose (as shown on picture)



3- Close the security door and, for 10 seconds (± 1 sec), set to the air pressure defined in the following table



Type of product	\varnothing Nominal (cm)	Complex thickness (μm)	Pressure (bar)
Complex laminate <i>with</i> aluminium	≤ 40	≥ 250	2.0
	> 40	≥ 250	1.8
Complex laminate <i>without</i> aluminium	≤ 40	< 250	1.5
	> 40	< 250	1.5

RESULTS

The test is considered conform if there is no sign of seal weakness neither on the side seam nor on the head-body seal.

NG 223: COPPER SULPHATE CONTACT TEST

OBJECT

The purpose of this standard is to check that there are no areas on the inside of the tube where the aluminium is left unprotected, as these may come into direct contact with the product being contained.

MATERIAL

The material employed in this test includes:

- Copper sulphate 5 H₂O: 1,00%
- Hydrochloric acid 37% solution 6,00%
- Water 93%
- Mixing the above elements will form the solution needed for the reactive contact.
- Finished tubes.
- Support utensils for carrying out the test.
- Chronometer.

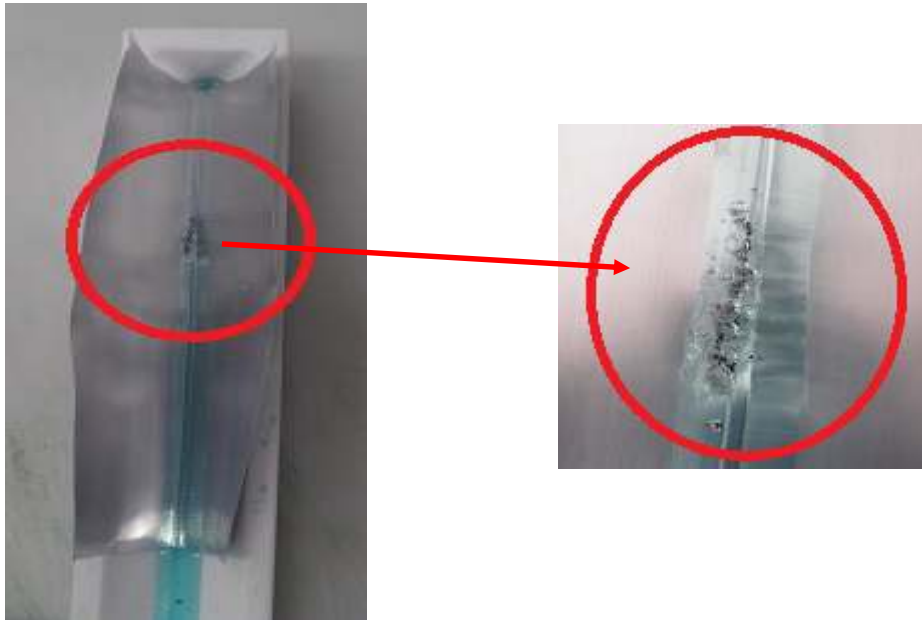
OPERATING MODE

1. Cut the body of the tubes on the side opposite to the side seam.
2. Bend the body inside out along the side seam to give it the shape of the utensil and then place it with the side seam face down onto the support utensil.
3. Cover the side seam with the aforementioned solution for at least 2 minutes (\pm 5 seconds).
4. Examine the side seam without moving or changing the solution applied or the tube being tested.



RESULTS

The test is considered satisfactory if no black dots or lines appear on the inside of the tube. The presence of dots or lines indicates that the solution has attacked the aluminium, revealing the existence of areas where the aluminium is not totally covered.



NG 224: PACKAGING & LABELLING CHECK. NUMBER OF UNITS

OBJECT

The purpose of this standard is:

- To establish the maximum and minimum tolerances with regard to quantities supplied to the customer, based on amounts ordered.
- To consider the packing that guarantees the integrity (to avoid deformation or damage), the correct conservation and the hygiene of the product as describe in the norm 232.
- To consider the labelling of shipments to guarantee the products' traceability.


In case of customer specific requirements, the customer will assume the no-quality risks for the product.

PERCENTAGE OF VARIATION FOR PRODUCT UNITS TO BE SUPPLIED

Our manufacturing system produces deviations between the amounts requested by the customer and the actual amounts manufactured.

These deviations vary based on the number of units requested in the order, as shown in the table below.

Number of tube units	Percentage of variation
From 25,000 to 30,000	-2% + 10%
From 30,001 to 50,000	-2% + 8%
From 50,001 to 80,000	-2% + 8%
From 80,001 to 100,000	-1,5% + 6%
From 100,001 to 200,000	-1,5% + 6%
From 200,001 to 500,000	-1,5% + 4%
From 500,001 to 1,000,000	±1%

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STANDARD PACKAGING COMPONENTS

<i>PALLET</i>	800 x 1200 EUR
<i>TRAY</i>	Made up of a base and cover, the outer dimensions of which must not exceed 600 x 400 mm. It is obligatory to pack laminated tubes in an ordered fashion.
<i>PLASTIC BAG</i>	Placed on the inside of the tray and the box.
<i>PLASTIC SHEET</i>	Covering the pallet
<i>PLASTIC SHEET</i>	Covering the trays or boxes stacked on the pallet.
<i>STRETCH FILM</i>	Outer covering for the pallet + trays or boxes
<i>LABELLING</i>	1 label for identification and tracing purposes per tray/box 2 shipment labels (1 on the long side and 1 on the short side) * See Chapter 8, position of shipment label.

STANDARD HEIGHTS (The height of the pallet is included).

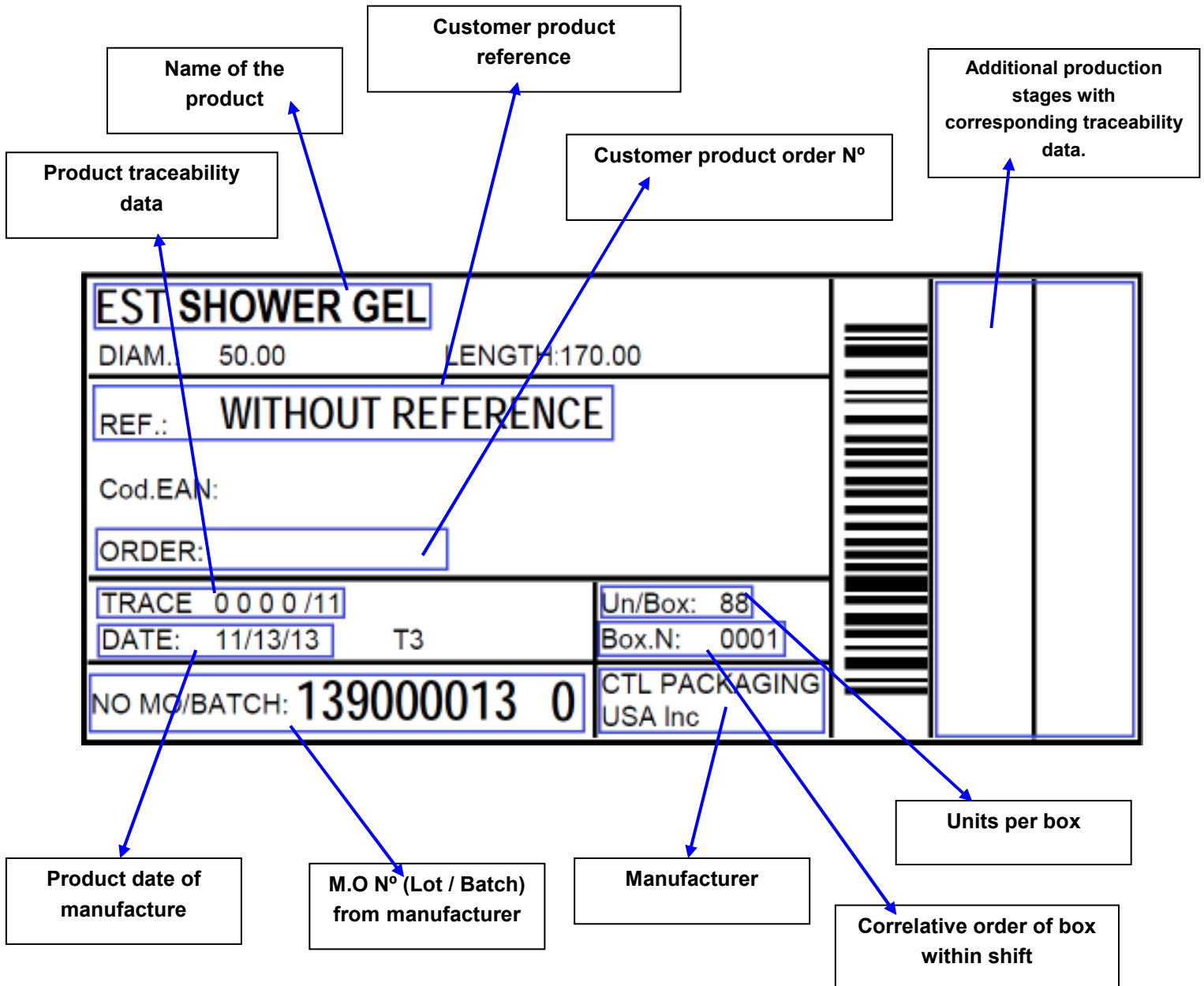
1,200 mm
2,150 mm

NOTE: For container shipment, the maximum height is 2,150 mm

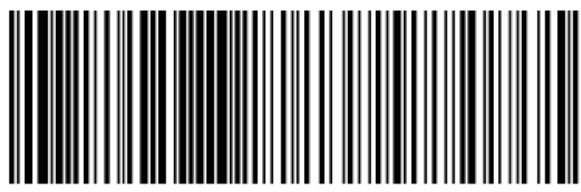
LABELLING OF THE PRODUCT

A) IDENTIFICATION & TRACEABILITY LABEL

Below are defined the various fields for the identification and traceability of the product label:



B) SHIPMENT LABEL

Sender:	CTL PACKAGING SAS ROUTE DE SAINT POURCAIN 03110 CHARMEIL	Goods:	T.PLAST.CILIND
		Warehouse date:	14/11/13 T1
		Production date:	11/02/08
		Production site:	2
N° OF (lot):	200711521 0		
Adresse:	TUBOPLAST HISPANIA, S.A		
Adress:	HERMANOS LUMIERE n°1, 01510 MINANO (ALAVA)		
Item:	04827		
Customer order:	9011		
SSCC:	384352236000046361		
DESIGN:	SOFTENER SHOWER GEL 150ML		
OEM: TUB	Tubes/Box: 88	Boxes/Palet: 30	
Content:		Quantity:	2640
 (11)080211(37)2640			
 (00)384352236000046361(10)2007115210			

Shipper

M.O N° = Lot /
Batch

Recipient

Product order N°
(from customer)

Palet
Identificator

Name of the
product

Number of units
per box

Goods

Date

Delivery address

Product reference
(from customer if
applicable)

AQP In case of
Quality Insurance.

Number of boxex
per pallet

Number units per
pallet

Barcode; has
defined in the GS1
- 128 standard

C) ACCEPTANCE LABEL

Each pallet is labelled with a label acceptance:



D) REMAINDER LABEL

Boxes that are not full are labelled with REMAINDER label and the number of units that it contains (manually written).



DELIVERY DOCKETS

The corresponding delivery docket will be included with each shipment; this will contain the following data.

<i>DELIVERY DOCKET</i>	<p>Delivery docket N°</p> <p>M.O N°</p> <p>Customer ID N°</p> <p>Delivery docket date</p> <p>Delivery address</p> <ul style="list-style-type: none"> - Customer - Address - City / Post Code - Province - Country <p>Form of shipment (transport)</p> <p>Carriage (paid/due)</p> <p>Product order N° (from customer)</p> <p>Product reference (from customer)</p> <p>N° of packages</p> <p>Quantity (tubes, boxes, pallets)</p> <p>Item (product, box, pallet)</p> <p>Invoice address</p> <ul style="list-style-type: none"> - Customer - Address - City / Post Code - Province - Country
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POSITION OF SHIPMENT LABEL ON PALLETS

Identified on two adjacent sides (long side and short side)

Pallets less than 400 mm

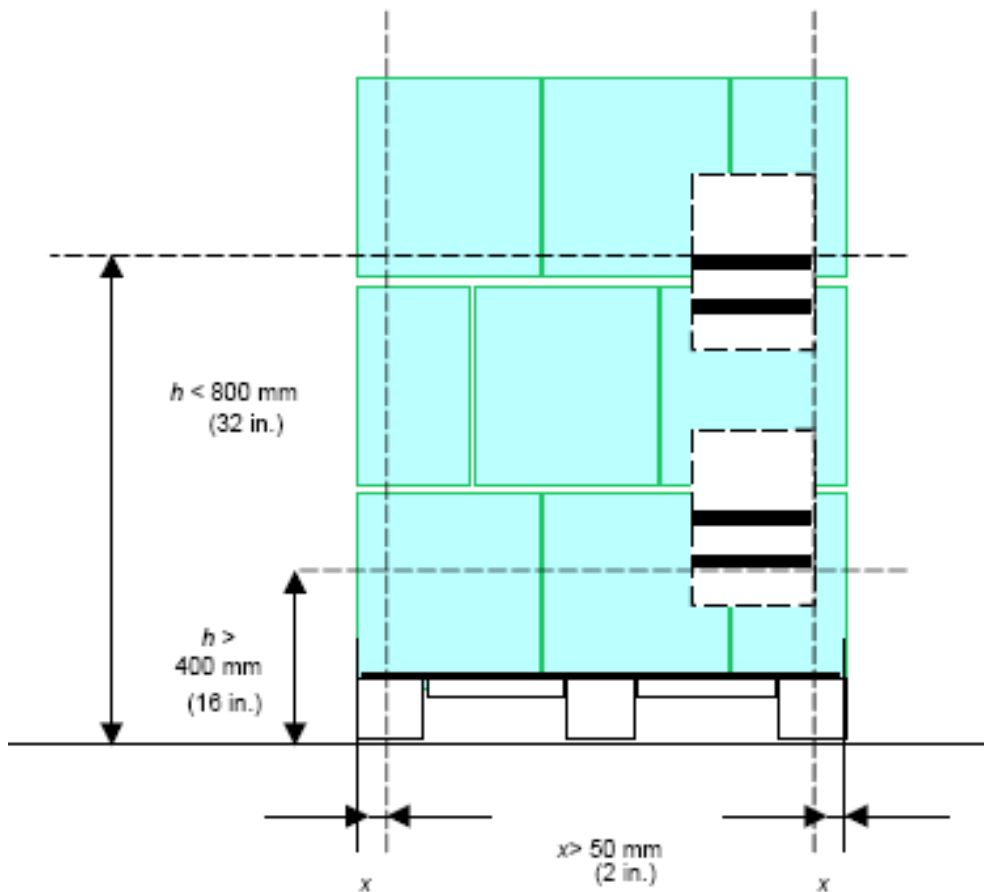
The labels must be positioned as high as possible, without the position hindering the reading of the labels.

They must not be placed less than 50 mm from the vertical edge.

Pallets greater than 400 mm

The labels must be placed at a height of 400 to 800 mm from the base of the pallet.

They must not be placed less than 50 mm from the vertical edge.



NG 226: ASSEMBLY STRENGTH TEST

OBJECT

The purpose of this standard is to measure the force necessary to pull off components that are assembled by pressure (like flip to caps, pumps, over-caps, dispensers, assembly cap-cover).

MATERIAL

The material employed in this test includes:

- Traction-compression tool.
- Dynamometer with a adapted charge cell (e.g. R100: 500Nx0.5N)
- Specific tools according to the component (pliers, tensile tester ...) to pull off.
- Samples of finished plastic tubes with caps fitted.
- Chuck.

Compression test:

Tubes with hinges

1. Place the tube-cap assembly into traction-compression tool.
2. Then align the carriage and the load arm on the same axis.
3. Once those elements are properly aligned, start the test. The load arm automatically vertically goes down to disassemble the parts.
4. Once the elements are positioned correctly, the test starts and the loading arm automatically performs a vertical movement until the piece is disassembled.
5. Read the value of the force disassembly on the screen.





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RESULTS

The test is considered conform if values are inside tolerances defined in the following table:

POSITOP TUBES and push on heads

	Disassembly force (N)	Trial speed (mm/min)
Flip-top lids on tubes (apply to push on heads)	≥ 80	300

NG 229: DECORATION-TREATMENT STRENGTH TEST FOR CAPS

OBJECT

The purpose of this standard is to determine the surface strength of the decoration / treatment of a cap when subjected to various tests. The said tests will be carried out no sooner than 48 hours after having been decorated / treated. The following are examples of what is considered as decoration / treatment: Metalized coating, lacquering, pad printing, painting, and transfer printing and stamping of caps.

TESTS

The following tests form part of this standard:

- **Decoration / treatment adherence test using adhesive tape.**
- **Decoration test with grid comb + adherence with adhesive tape** (only for metalized and galvanized caps).
- **Dry rubbing test of decoration / treatment.**
- **Water resistance test of decoration / treatment.**
- **Solvent resistance test (exclusive to metalized coating)**
- **Resistance to abrasion – linear abrasion testing machine.**

ADHERENCE TEST USING ADHESIVE TAPE

• **Material:**

The material employed in this test includes:

- An adhesive tape (scotch) with an adhesion strength of 350 to 450 CN/Cm² (e.g. Ref. 616, 3M or similar).
- An adhesive tape (scotch), (e.g. Ref.: 810, 3M or similar).
- Chronometer.
- Decorated caps (Stamping).

• **Operating mode:**

For all the decorations that may appear in a tube, except for hot-foil stamping the paper 3M tape, Ref: 616 (or similar) is used.

For hot-foil stamping, according to the hot-foil used for manufacturing the tube, the assay is performed with different adhesive tape (Scotch):

- **ADHESIVE TAPE 3M, REF. 616:** Adhesive tape used for standard hot-foil homologated and with alternative foil (shiny gold, mat gold, shiny silver, mat silver).
- **ADHESIVE TAPE 3M, REF. 810:** Adhesive tape used for specific hot-foil and customer hot-foil (copper, colour, ...)

- 1- A strip of Scotch tape, 6 cm long, is affixed along the main axis of the cap over the printed surface.
- 2- Press manually along the entire length of the decoration. It is very important that there is full contact between the surface of the tape and the entire area where it sticks, so that there is no air bubbles between the tape and the sample surface.
- 3- The time between affixing the adhesive tape and its removal should be no more than 1 minute (\pm 5 sec).
- 4- The tape is then pulled at one end to remove it quickly and abruptly, with an angle of 45°.



Tubes manufactured with transfer printing over stamping will be exempt from this test (is not applied).

• **Results:**

The test is considered conform if none of the decorated elements are transferred to the adhesive tape (no lack of printing or coating, no loosening of varnishes, no attenuation of colours, not shown transfers print on the tape, no signs of deterioration or strips in the printing).

TEST WITH GRID COMB + ADHERENCE WITH ADHESIVE TAPE

• Material:

The material employed in this test includes:

- An adhesive tape (Scotch) with an adhesion strength of 350 to 450 CN/Cm² (e.g. Ref. 616, 3M or similar).
- Grid comb (check the good state of the blades).
- Caps metalized or galvanized.
- Chronometer.

• Operating mode:

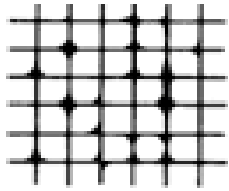
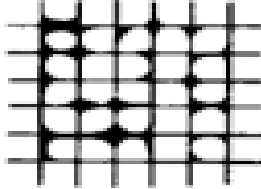
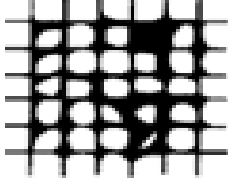
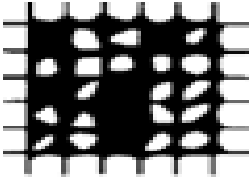
- 1- Utilising the grid comb, make both a radial and top grid pattern on the cap.
- 2- Use a clean cloth on the gridded surface to remove residue



- 3- Then place a strip of Scotch tape (by finger pressure) in a radial direction and at the top of the cap over the decorated / treated surface.
- 4- The time between placing the adhesive tape and its removal should be no less than 1 minute (± 5 sec). The tape is then pulled at one end to remove it quickly and abruptly at a 45° angle.

• **Results:**

The test is considered conform if values are inside tolerances defined in the following table:

	<i>Surface appearance after testing</i>
CONFORMITY	Absence of withdrawal
	
	
NO CONFORMITY	
	

DRY RUBBING TEST

- **Material:**

The material employed in this test includes:

- Decorated caps.

- **Operating mode:**

1- Two samples are taken in pairs and placed opposite each other, one pair along their side axes and the other pair across the top surfaces.

2- Then, slide one across the other backwards and forwards five times.



- **Results:**

The test is considered conform if no wear is detected on the decorated / treated elements or the decorated / treated elements are not transferred from one product to the other.

WATER RESISTANCE TEST

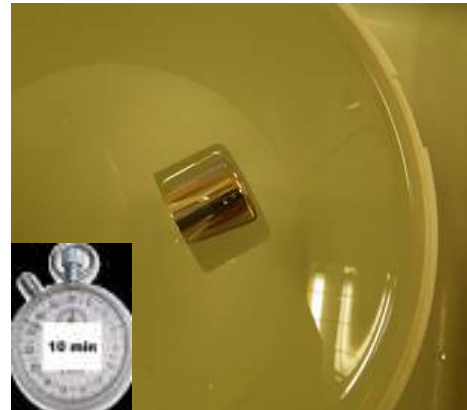
• **Material:**

The material employed in this test includes:

- Water at a temperature of 25°C.
- Cotton.
- Chronometer.

• **Operating mode:**

- 1- The samples are immersed in water at a temperature of 25°C \pm 3°C for 15 minutes (\pm 1 min) after which they are removed.



- 2- Then, the decorated / treated surface of the samples is then rubbed with cotton wool.

• **Results:**

The test is considered conform if no wear is detected on the decorated / treated surface.

SOLVENT RESITANCE TEST (Exclusive to metalized coating)

• **Material:**

The material employed in this test includes:

- Crystalliser
- Cotton
- Protective Film (Parafilm)

This is a solvent formula made up in weight by:

- 20% (+- 5%) essence of turpentine (CAS: 8006-64-2).
- 10% (+- 5%) ethyl phthalyl (CAS: 84-66-2).
- 70% (+- 5%) ethyl alcohol 95° (CAS: 64-17-5).

• **Operating mode:**

1. The samples are placed in a Petri dish.



2. Covered with hydrophilic cotton.



3. 5 ml of the formula is poured evenly over the cotton, preventing that the untreated surface of the cap being in contact with the solvent.





4. Cover the crystalliser with a layer of protective film (parafilm). Make sure the whole surface is covered to prevent evaporation.



5. Remove and check the item after 4 hours: remove the cotton and gently rub the printed area with a finger or with a soft cloth.

• **Results:**

The test is considered conform if, after 4 hours (\pm 3 minutes) of testing, no lines, no stains, no dots, no cracks, no blistering or no noticeable changes to the decorated / treated surface appear..

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RESISTANCE TO ABRASION – LINEAR ABRASION TESTING MACHINE.

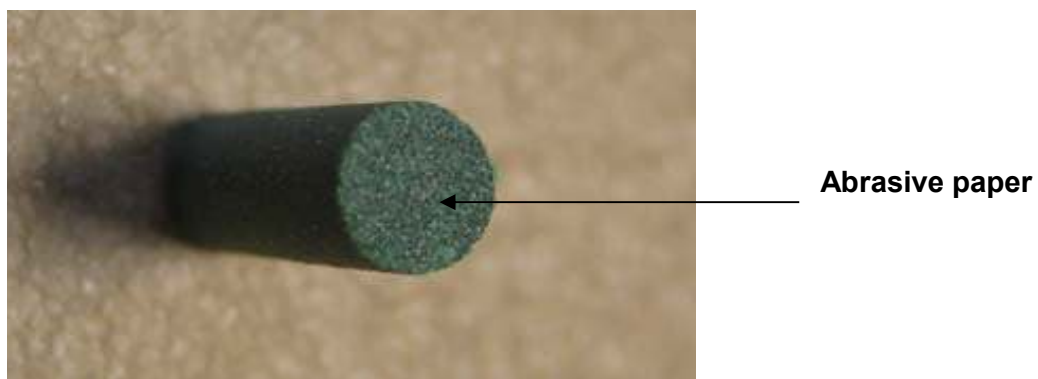
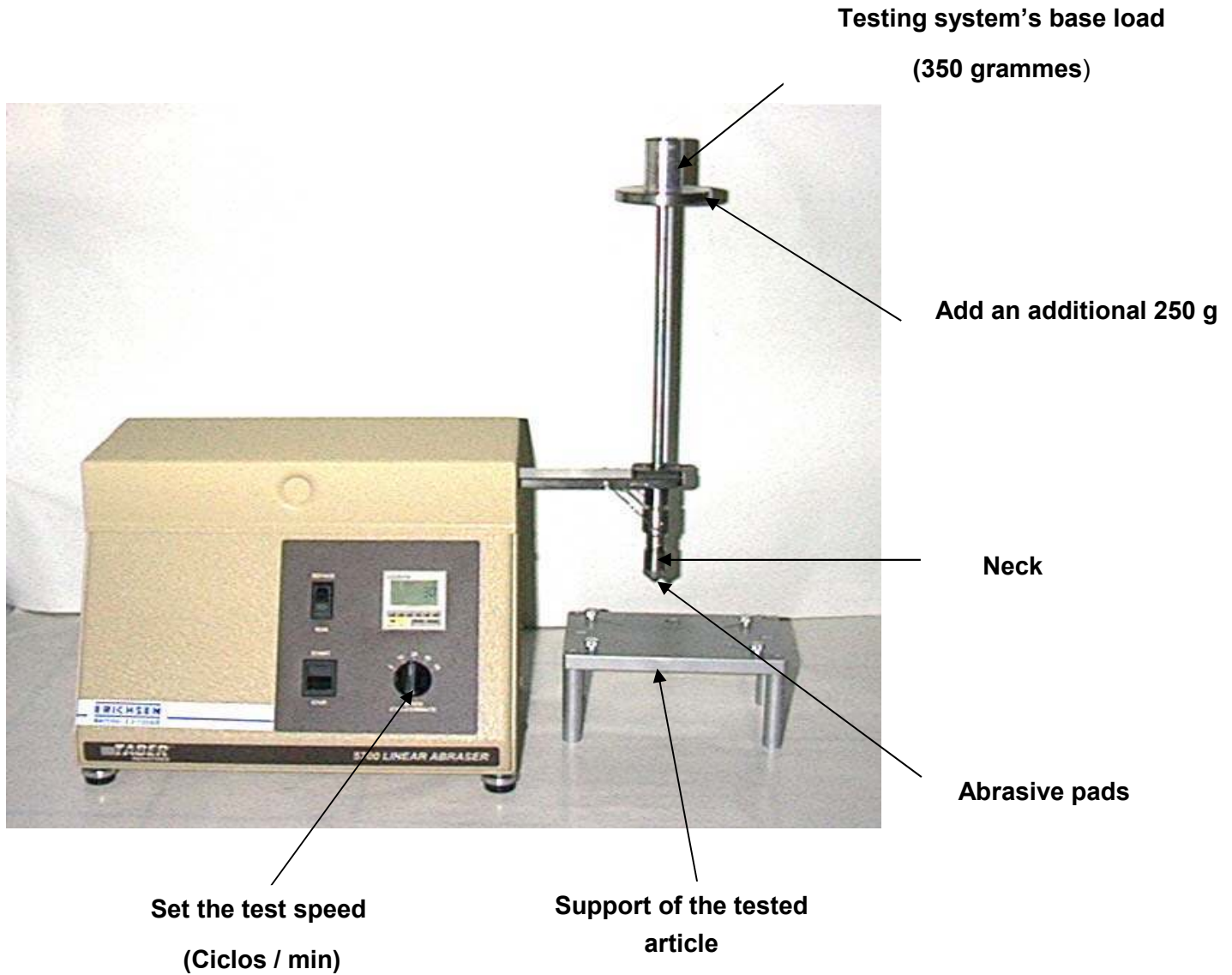
• **Material:**

The material employed in this test includes:

- Test instrument: Linear abrasion tester (e.g.: TABER INDUSTRIES distributed by ERICHEN)
- Add an additional 250 g .
- CS 10, 1/4 “ diameter abrasive pads.
- Abrasive paper for the pad.
- Decorated caps.

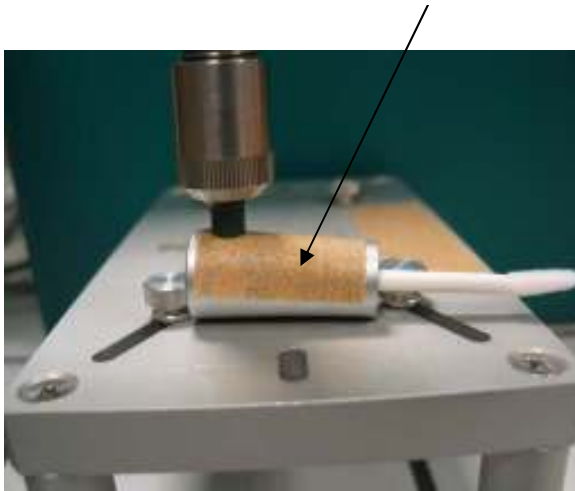
• **Operating mode:**

1. Add an additional 250 g to the testing system’s base load, which is 350 g, obtaining a total abrasive load of 600 g.
2. Adjust the length of the stroke based on the surface to be tested (if not specified).
3. Set the test speed to 25 cycles / minute.



- Adjust the pad with the abrasive paper so that it adapts to the shape of the item being tested (in the case of curved items, shape the pad by placing the abrasive paper over the item and the surface to be tested) and note the initial colour of the pad. This set-up is repeated before each operation or piece being tested.

Abrasive paper



**Rectify the pad on the abrasive paper
glued to the article**



Test

- Carry out 35 cycles (backwards and forwards).
- Check the item and the test surface.

RESULTS

The tests are considered conform if no wear is detected on the decorated / treated surface.

The different decoration's defects will be classified as follows:

DESCRIPTION OF DEFECT	SPECIFIC DETAILS	A.Q.L
Cap decoration	Legal text Missing Full text o decoration missing.	0,65
	If defect visible at more than 40cm away for 5s Incomplete text, intuitively unreadable.	2,5
	If defect visible at less than 40cm and over 20cm away for 15s	10
	Small lacks Incomplete text, intuitively unreadable.	Acceptable

NG 231: INTER-TUBE SLIDING TEST

OBJECT

The purpose of this standard is to check the gliding properties between finished tubes (save tubes with SOFT-TOUCH surface finish).

MATERIAL

The material employed in this test includes:

- CTL-TH Packaging Group internal testing appliance, basically an adjustable inclined plane equipped with an end holding stop on to which two finished tubes are placed.
- Samples of finished plastic tubes with caps fitted.

OPERATING MODE

- 1- Set the test appliance at an angle of $30^{\circ} (\pm 3^{\circ})$.
- 2- Next, put down tubes with the caps facing upward one beside the other in order to fill the base of the testing appliance.
- 3- Then place tubes, with the cap facing upward, on top of the others tubes and at the same level, allowing it to slide under its own weight over the gyniatrics of the two below.



RESULTS

The test is considered conform if the top tubes slide under its own weight.

NG 232: ARTICLE CLEANNESS TEST

OBJECT

The purpose of this standard is to evaluate visually the cleanliness of items, in the case of special requirements granted by contract with the client, to evaluate the microbial load of items (count of aerobic mesophilic microorganisms, molds and yeasts).

SCOPE

This method will be applied to plastic tubes and caps.

TESTS

The following tests form part of this standard:

- **Visual control.**
- **Microbiological control.**

VISUAL CONTROL

• **Material:**

The material employed in this test includes:

- The samples in accordance with standard sampling plan NG112.
- Sufficient light conditions (eg light cabin DL65).

• **Operating mode:**

Check the appearance of the exterior and interior of the tube at a distance of 40 cm for 15 seconds

Results:

The test is considered conform according to the table below:

DEFECT CODE	NAME OF DEFECTS		SPECIFIC DETAILS		A.Q.L	
			No. PARTICLES	PARTICLE SIZE		
<u>232</u>	<u>CLEANLINESS</u>					
232.1	INTERNAL CONTAMINATION	<u>Diameter of contamination</u> (grease, dust, cardboard particles, inclusions (gels, burned material, infused))	1 - 2 Particles	> 2 mm	0,1	
				1 mm > X ≤ 2 mm	1	
				0,2 mm > X ≤ 1 mm	6,5	
			≥ 3 Particles	≤ 0,2 mm	Acceptable	
				> 1 mm	0,1	
				0,2 mm > X ≤ 1 mm	1	
		<u>Length of the contamination</u> (grease, dust, cardboard particles, inclusions (gels, burned material, infused))	1 - 2 Particles	> 5 mm	0,1	
				2 mm > X ≤ 5 mm	1	
				1 mm > X ≤ 2 mm	6,5	
			≥ 3 Particles	≤ 1 mm	Acceptable	
				> 1 mm	0,1	
				1 mm > X ≤ 2 mm	1	
		Insects, foreign bodies				6,5
		Insects, foreign bodies				0,1
232.2	EXTERNAL CONTAMINATION	<u>Diameter of the contamination</u> (grease, dust, cardboard particles, inclusions (gels, burned material, infused))	1 - 2 Particles	> 2 mm	1	
				1 mm > X ≤ 2 mm	6,5	
				≤ 1 mm	Acceptable	
			≥ 3 Particles	> 1 mm	1	
				0,2 mm > X ≤ 1 mm	6,5	
				≤ 0,2 mm	Acceptable	
		<u>Length of the contamination</u> (grease, dust, cardboard particles, inclusions (gels, burned material, infused))	1 - 2 Particles	> 5 mm	1	
				2 mm > X ≤ 5 mm	6,5	
				≤ 2 mm	Acceptable	
			≥ 3 Particles	> 5 mm	0,1	
				2 mm > X ≤ 5 mm	1	
				1 mm > X ≤ 2 mm	6,5	
		Insects, foreign bodies				Acceptable
		Insects, foreign bodies				1

MICROBIOLOGICAL CONTROL

- **Material:**

The material employed in this test includes:

- Samples
 - Gloves and sterile bags for sampling.
 - 10 samples distributed over the production
- Equipment
 - Suitable microbiological safety cabinet.
 - A vacuum pump
 - Sterile membranes in cellulose derivatives of \varnothing 47 mm and a porosity of 0.45 μ .
 - Incubators (25 \pm 2 ° C)
 - clamps, containers, ... sterile for handling.
- Nutrient medium: Eugon LT100 liquid (g / L of purified water)
 - Pancreatic peptone of casein 15.0
 - Papain soy peptone 5.0
 - L-cystine 0.7
 - Sodium chloride 4.0
 - Sodium sulfite 0.2
 - Glucose 5.5
 - LT100 (egg lecithin 1.0 + Tween 80 5.0 + Triton X 100 1.0)
- Nutrient medium: tryptic soy agar (g / L of purified water)
 - Pancreatic peptone of casein 15.0 g
 - Papain soy peptone 5.0 g
 - Sodium Chloride 5.0 g
 - Agar 15.0 g

- **Operating mode:**

Principle: The micro-organisms are collected by rinsing with liquid nutrient medium Eugon and then concentrated by filtration. Later, they are counted after growth on nutrient medium Gelose until colonies are obtained.



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1. Fill in each item with the liquid nutrient medium Eugon LT100 to a quarter of its capacity and at least with 10 ml if the volume of the AC permits. If the article does not allow it, treat items as a whole.
2. Stir slowly by turning to rinse the sides and let stand 5 minutes.
3. Individually for each item, filter the entire liquid nutrient medium on a membrane of 0.45 microns. If the rinsing volume is less than 10 ml, filter the contents of all of the sampling.
4. Get the membrane and lay down aseptically on Trypticase soy agar
5. Incubate the Petri dishes, cover down, 5 days at 25 ± 2 ° C.

Reading: After incubation, count colonies (contamination) on the filter or on the agar. The result is expressed in CFU / Item (Colony Forming Unit) per item tested (in the case of articles of capacity <10ml rinsed jointly).

- **Results:**

The test is considered conform if each individual sample has less than 100 CFU / Item (Colony Forming Unit) and none belonging to the species *Candida albicans*, *Pseudomonas aeruginosa*, *Staphylococcus aureus* or *enterobacteria*.

NG 233: WEIGHT TUBES CONTROL

OBJECT

The purpose of this standard is to define the method of controlling the weight of the finished tubes.

MATERIAL

The material employed in this test includes:

- Samples of the finished tube.
- Scale (precision of 0.01g).



OPERATING MODE

1. Take the samples of the finished tubes.
2. Individually weigh the tubes.

RESULTS

The weight is measured as indicative and informative.

