






**TECHNICAL SPECIFICATIONS
FOR IML ESTube PLASTIC TUBES**

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Summary of modifications	<ul style="list-style-type: none"> • NG 311: Selection of Raw Materials • NG 312: Appearance test <ul style="list-style-type: none"> - New specific details and defects in the appearance of the tube. • NG 313: Dimensional check <ul style="list-style-type: none"> - Modification of drawing dimensions in the table "Positioning of the impression". - Included the elliptical tube and its tolerances in the table "Centering the cap or head with the impression" and introduce the control method - Modify the Perpendicularity formula • NG 316: Torque unscrewing → Enter unscrewing head values in the table of Sweet Line 16 and the values for Ø35. • NG 330: Priming and dosage test for dispensing pumps → Modify the weight values of 10 dosed from the table of result and enter a new motor reference for the pump "Motor PZ3 cream 250µl". • NG 332: Article cleanness test → Modify the table of results • NG 334: Control of the breaking strength of the first-use seal "SAFETOP" → Introduce new standard • NG 335: Drop Test → Introduce new standard
Replace	E.00.00002 V07

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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 plastic 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
311	Raw materials	Not applicable. For information only
312	Appearance of plastic tubes	Cr 0,1 Ma 1 me 6,5
313	Dimensional	Cr 0,1 Ma 1 me 6,5
314	Resistance of decoration	Cr 0,65 Ma 2,5 me 10

315	Seal tightness	0,1
316	Torque unscrewing	1
317	Stress cracking	0,1
318	Head-body weld strength	0,1
319	Tube seal weld strength	0,1
320	Barcode reading	Cr 0,1 Ma 1
321	Tamper evidence force	1
322	Resistance to fatigue for flip-top lids	Cr 0,1 Ma 1 me 6,5
323	Opening force for flip-top lids	1
324	Packaging and labelling. Number of units	Not applicable. For information only
325	Break strength through twisting of flip-top lids	1
326	Assembly strength	1
327	Plastiband positioning	Cr 0,1 Ma 1 me 6,5
329	Decoration-treatment strength of caps	Cr 0,65 Ma 2,5 me 10
330	Priming and dosage for dispensing pumps	1
331	Inter-tube sliding	1
332	Article cleanness	Cr 0,1 Ma 1 me 6,5
333	Weight tubes	See Standard
334	Control of the breaking strength of the first-use seal of the "SAFETOP" cap	1
335	Drop Test	0.1

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.

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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.

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.

3 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.

4 GENERAL NORMS (NG)

NG 311: SELECTION OF RAW MATERIAL

OBJECT

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

FIELD OF APPLICATION

This standard apply those raw materials used in the manufacture of tubes and caps that are in direct contact with the product contained, as a whole complex.

OPERATING MODE

A. 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 compatibility 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 inform the customer after the necessary tests if is compatible with the product to contain. 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.

B. 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 312: 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 lighted 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:

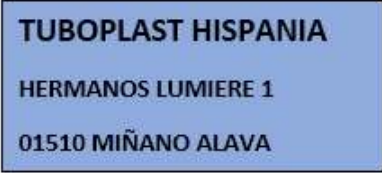
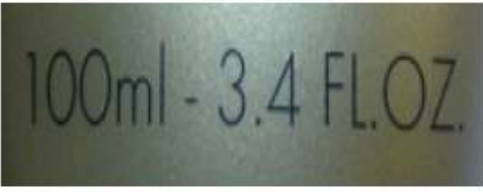

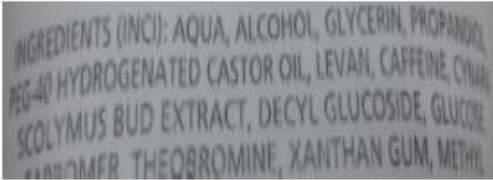
1. *0 defects* are defined using the following categories:

1.1 Decoration with legal texts

- Total absence
- Non-compliant according with BAG
- Mixed references

If there is a mixture of an article without decoration or legal text (example cap), it is not considered zero defect.

It is considered as a legal text the points defined in the following table:

Legal Information	Example
Marketing address	
Capacity	
Product Function	
List of ingredients	

1.2 Functional

- Missing cap

2. **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.
 - They generate a total absence of decoration in terms of following legal mentions are referred to: the period of use after the opening (if displayed), symbol which indicates that the material is recyclable, the symbol 'e' means "net quantity", and refers to the content of product excluding container, special precautions for use (if applicable), the name "Made in..." and the type of material used to manufacture the tube.

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 EST TUBES:

Appearance of EST Tubes	
0 DEFECTS	A.Q.L = 0
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, lids open	If it hinders air tightness - operation – use	0,1
		If defect visible at more than 40cm (1.31 foot) away for 5s	1
		If defect visible at less than 40cm (1.31 foot) and over 20cm (0.66 foot) away for 15s	6,5

DEFECT CODE	DESCRIPTION OF DEFECT	SPECIFIC DETAILS	A.Q.L
<u>10</u>	<u>CAP DEFECTS</u>		
10.2	Creased, deformed cap	If it hinders air tightness - operation – use	0,1
		If defect visible at more than 40cm (1.31 foot) away for 5s	1
		If defect visible at less than 40cm (1.31 foot) and over 20cm (0.66 foot) away for 15s	6,5
10.3	Missing seal		0,1
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	Sharp Edge of the over-cap	Can injure the consumer	0,1
		If defect visible at more than 40cm (1.31 foot) away for 5s	1
		If defect visible at less than 40cm (1.31 foot) and over 20cm (0.66 foot) away for 15s	6,5
10.6	Plastic cap visible under the over-cap	>1mm (0.039 inches)	6,5
		≤1mm (0.039 inches)	Acceptable
10.7	Presence of blue on the outsider of the sleeve		6,5
10.8	Scratches, marks	If defect visible at more than 40cm (1.31 foot) away for 5s	1
		If defect visible at less than 40cm (1.31 foot) and over 20cm (0.66 foot) away for 15s	6,5
10.9	Sink marks	If defect visible at more than 40cm (1.31 foot) away for 5s	1
			6,5

DEFECT CODE	DESCRIPTION OF DEFECT	SPECIFIC DETAILS	A.Q.L
<u>10</u>	<u>CAP DEFECTS</u>		
		If defect visible at less than 40cm (1.31 foot) and over 20cm (0.66 foot) away for 15s	
10.10	External inclusions (burnt material, bursts, gels, unmolten material).	SEE ACCORDING TO THE TABLE DEFINED IN NG: 332 - CONTROL OF THE CLEANING OF ITEMS	
10.11	Internal inclusions (burnt material, bursts, gels, unmolten material).	SEE ACCORDING TO THE TABLE DEFINED IN NG: 332 - CONTROL OF THE CLEANING OF ITEMS	
10.12	Cap without perforation (when cap insure the exit of the product).		0,1
10.13	Thread	Discontinuous thread	0,1
		Smudged thread	1
10.14	Rough edges	> 1mm (0.039 inches)	1
		>0,5 to ≤1mm (>0.020 to ≤0.039 inches)	6,5
		≤ 0,5mm (≤0.020 inches)	Acceptable
10.15	Outside injection point	> 1mm (0.039inches) with risk of injuring consumer	0,1
		> 1mm (0.039 inches) without risk of injuring consumer	6,5
		≤1mm (0.039 inches)	Acceptable
10.16	Inside injection point	Affects functionality	1
		Do not affect functionality	Acceptable

DEFECT CODE	DESCRIPTION OF DEFECT	SPECIFIC DETAILS	A.Q.L
<u>10</u>	<u>CAP DEFECTS</u>		
10.17	Stretched thread	If it hinders air tightness - operation – use	0,1
		> 1mm (0.039 inches)	1
		>0,5 to ≤1mm (>0.020 to ≤0.039 inches)	6,5
		≤ 0,5mm (≤0.020 inches)	Acceptable
10.18	Bursts / Gases / Air bubble	If necessary, limits to be defined with a range board.	Acceptable
10.19	Tamper evidence missing or broken (Safetop)		0,1
10.20	Union points (4) of the tamper evidence	> 1mm (0.039 inches) with risk of injuring consumer	0,1
		> 1mm (0.039 inches) without risk of injuring consumer	6,5
		≤ 1mm (0.039 inches)	Acceptable
10.21	Coloring Pearly flow	Of the injection process	Acceptable
10.22	Delamination	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>PLASTIBAND DEFECTS</u>			
20.1	Missing plastiband on cap			0,1
20.2	Cap plastiband torn or broken	Completely		1
		Partially		6,5
20.3	Microperforation on cap plastiband	Total absence		1
		Partial absence		6,5
20.4	Folded plastiband	Cylindrical tubes	Folded on the sleeve	6,5
			Folded on the top	Acceptable
		Elliptical tubes	Folded on the sleeve	Acceptable
			Folded on the top	Acceptable

DEFECT CODE	DESCRIPTION OF DEFECT	SPECIFIC DETAILS		A.Q.L
<u>30</u>	<u>SLEEVE INJECTION AND LABEL DEFECTS</u>			
30.1	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
30.2	External inclusions (burnt material, bursts, gels, unmolten material).	SEE ACCORDING TO THE TABLE DEFINED IN NG: 332 - CONTROL OF THE CLEANING OF ITEMS		

DEFECT CODE	DESCRIPTION OF DEFECT	SPECIFIC DETAILS	A.Q.L
<u>30</u>	<u>SLEEVE INJECTION AND LABEL DEFECTS</u>		
30.3	Internal inclusions (burnt material, bursts, gels, unmolten material).	SEE ACCORDING TO THE TABLE DEFINED IN NG: 332 - CONTROL OF THE CLEANING OF ITEMS	
30.4	Other defects on the tube skirt (creases, marks, lines, dots, dirt, etc.).	If defect visible at more than 40cm (1.31 foot) away for 5s	1
		If defect visible at less than 40cm (1.31 foot) and over 20cm (0.66 foot) away for 15s	6,5
30.5	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
30.6	Upper-injection	If it hinders air tightness - operation – use	0,1
		If only aesthetic	1
30.7	Deformed-blended tubes	If it hinders air tightness - operation – use	0,1
		If defect visible at more than 40cm (1.31 foot) away for 5s	1
		If defect visible at less than 40cm (1.31 foot) and over 20cm (0.66 foot) away for 15s	6.5
30.8	Dragged material	If defect visible at more than 40cm (1.31 foot) away for 5s	1
		If defect visible at less than 40cm (1.31 foot) and over 20cm (0.66 foot) away for 15s	6,5
30.9	Rough edges in the base	If it hinders operation – use	0,1
		If only aesthetic	Acceptable

DEFECT CODE	DESCRIPTION OF DEFECT	SPECIFIC DETAILS		A.Q.L
<u>30</u>	<u>SLEEVE INJECTION AND LABEL DEFECTS</u>			
30.10	Cracked	Inside the sealing area	If it hinders air tightness - operation – use	0,1
		Outside the sealing area	If defect visible at more than 40cm (1.31 foot) away for 5s	1
			If defect visible at less than 40cm (1.31 foot) and over 20cm (0.66 foot) away for 15s	6,5
		If the defects is 3 mm from the base (at that distance this defect is not appreciated on the tube)		Acceptable
30.11	Wash Out	If defect visible at more than 40cm (1.31 foot) away for 5s		1
		If defect visible at less than 40cm (1.31 foot) and over 20cm (0.66 foot) away for 15s		6,5
30.12	Missing material in the base	If it hinders air tightness - operation – use		0,1
30.13	Bubbles / Air pockets	If defect visible at more than 40cm (1.31 foot) away for 5s		1
		If defect visible at less than 40cm (1.31 foot) and over 20cm (0.66 foot) away for 15s		6.5
30.14	Creases on the base of the tube	If defect visible at more than 40cm (1.31 foot) away for 5s		1
		If defect visible at less than 40cm (1.31 foot) and over 20cm (0.66 foot) away for 15s		6.5
		If the defects is 5 mm from the base (at that distance this defect is not appreciated on the tube)		Acceptable
30.15	Detached edges	If defect visible at more than 40cm (1.31 foot) away for 5s		1

DEFECT CODE	DESCRIPTION OF DEFECT		SPECIFIC DETAILS	A.Q.L
<u>30</u>	<u>SLEEVE INJECTION AND LABEL DEFECTS</u>			
			If defect visible at less than 40cm (1.31 foot) and over 20cm (0.66 foot) away for 15s	6.5
30.16	Label's overlapping : - Small marks, undulation, deformations.		If defect visible at more than 40cm (1.31 foot) away for 5s	1
			If defect visible at less than 40cm (1.31 foot) and over 20cm (0.66 foot) away for 15s	6.5
30.17	Twisted		> 1mm (0.039 inches)	1
			>0,5 to ≤1mm (>0.020 to ≤0.039 inches)	6.5
			≤ 0,5mm (≤0.020 inches)	Acceptable
30.18	IML Film positioning	Street	> 1mm	1
			> 0,5 y ≤ 1mm	6.5
		Overlap	≤ 0,5mm	Acceptable
30.19	Orange Peel		If defect visible at more than 40cm (1.31 foot) away for 5s	1
			If defect visible at less than 40cm (1.31 foot) and over 20cm (0.66 foot) away for 15s	6.5
30.20	Bubbles		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>INJECTION OF HEAD-SLEEVE DEFECTS</u>		
40.1	Rough edges – marks on joint between head/body	> 1mm (0.039 inches)	1
		>0,5 to ≤1mm (>0.020 to ≤0.039 inches)	6,5
		≤ 0,5mm (≤0.020 inches)	Acceptable
40.2	Defects and deformations on the head of the tube	If it effects air tightness	0,1
		If defect visible at more than 40cm (1.31 foot) away for 5s	1
		If defect visible at less than 40cm (1.31 foot) and over 20cm (0.66 foot) away for 15s	6,5
40.3	No opening (product outlet) on tube		0,1
40.4	Collar	If defect visible at more than 40cm (1.31 foot) away for 5s	1
		If defect visible at less than 40cm (1.31 foot) and over 20cm (0.66 foot) away for 15s	6,5
40.5	Thread	Discontinuous thread	0,1
		Smudged thread	1
40.6	Head's colour (see note-4)	Wrong colour	0,1
		If ΔE >5 in comparison with standard	1
		If ΔE is between 5 and 3 in comparison with standard	6,5
		If ΔE <3 in comparison with standard	Acceptable
40.7	Beaded (union body and head)	Low (affects sealing)	0,1

DEFECT CODE	DESCRIPTION OF DEFECT	SPECIFIC DETAILS	A.Q.L
<u>40</u>	<u>INJECTION OF HEAD-SLEEVE DEFECTS</u>		
		If defect visible at more than 40cm (1.31 foot) away for 5s	1
		If defect visible at less than 40cm (1.31 foot) and over 20cm (0.66 foot) away for 15s	6,5
40.8	Injection “tears”	If defect visible at more than 40cm (1.31 foot) away for 5s	1
		If defect visible at less than 40cm (1.31 foot) and over 20cm (0.66 foot) away for 15s	6,5
40.9	External inclusions (burnt material, bursts, gels, unmolten material).	SEE ACCORDING TO THE TABLE DEFINED IN NG: 332 - CONTROL OF THE CLEANING OF ITEMS	
40.10	Internal inclusions (burnt material, bursts, gels, unmolten material).	SEE ACCORDING TO THE TABLE DEFINED IN NG: 332 - CONTROL OF THE CLEANING OF ITEMS	
40.11	Bursts	Sharp	6,5
		Diffused	Acceptable
40.12	Stretched thread	If it hinders air tightness - operation – use	0,1
		> 1mm (0.039 inches)	1
		>0,5 to ≤1mm (>0.020 to ≤0.039 inches)	6,5
		≤ 0,5mm (≤0.020 inches)	Acceptable

DEFECT CODE	DESCRIPTION OF DEFECT	SPECIFIC DETAILS		A.Q.L
<u>50</u>	<u>DECORATION DEFECTS</u> (DIGITAL FLEXOGRAPHY, METALLIC,...)			
50.1	Mixed references	With legal text		0
		Without legal text		0,1
50.2	Absence of decoration	NO legal text	Total absence	
			Incomplete text intuitively unreadable	1
			Incomplete text intuitively readable	Acceptable
		Legal text (countenance, composition, society name...)	Total absence (according to definition of 0 defects)	0
			Total absence (according to definition of critical defects)	0,1
			Non-compliant according with BAG	0
Incomplete text intuitively unreadable	1			
Incomplete text intuitively readable	Acceptable			
50.3	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 (1.31 foot) away for 5s	1
			If defect visible at less than 40cm (0.66 foot) and over 20cm (0.66 foot) away for 15s	6,5
		Posterior side	If defect visible at more than 40cm (1.31 foot) away for 5s	6,5
			If defect visible at less than 40cm (1.31 foot) and over 20cm (0.66 foot) away for 15s	Acceptable

DEFECT CODE	DESCRIPTION OF DEFECT	SPECIFIC DETAILS		A.Q.L
<u>50</u>	<u>DECORATION DEFECTS</u> (DIGITAL FLEXOGRAPHY, METALLIC,...)			
50.4	Colour – tone (see note-4)	Regarding to the first production (for repetitive productions)	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
		Regarding to the standard sample (for label approval)	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>60</u>	<u>VARNISH DEFECTS</u>		
60.1	Lack of varnish	Total absence	0,1
60.2	Wrong effect of the varnish	If defect visible at more than 40cm (1.31 foot) away for 5s	1
		If defect visible at less than 40cm (1.31 foot) and over 20cm (0.66 foot) away for 15s	6,5
60.3	Marks and scratches of the varnish	If defect visible at more than 40cm (1.31 foot) away for 5s	1
		If defect visible at less than 40cm (1.31 foot) and over 20cm (0.66 foot) away for 15s	6,5


DEFECT CODE	DESCRIPTION OF DEFECT	SPECIFIC DETAILS	A.Q.L
<u>60</u>	<u>VARNISH DEFECTS</u>		
60.4	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>70</u>	<u>TAMPER EVIDENCE DEFECTS</u>			
70.1	Tamper evidence position	Tamper evidence missing	0,1	
		Perforated seal (with leakage to water or compressed air at 0.5 bar)	0,1	
		Decentered or partially detached seam with uncovered perforation	1	
		Out of center or partially detached seam with perforation cover	Acceptable	
70.2	Burnt or scratched	If defect visible at more than 40cm (1.31 foot) away for 5s	1	
		If defect visible at less than 40cm (1.31 foot) and over 20cm (0.66 foot) away for 15s	6,5	
70.3	Broken tab	Makes difficult to remove tamper evidence	1	
		Do not make difficult to remove tamper evidence	6,5	
70.4	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>80</u>	<u>CAPPING DEFECTS</u>		
80.1	Cap missing		0,1
80.2	Broken cap	If it hinders air tightness - operation – use	0,1
		If defect visible at more than 40cm (1.31 foot) away for 5s	1
		If defect visible at less than 40cm (1.31 foot) and over 20cm (0.66 foot) away for 15s	6,5
80.3	Creased, deformed cap	If it hinders air tightness - operation – use	0,1
		If defect visible at more than 40cm (1.31 foot) away for 5s	1
		If defect visible at less than 40cm (1.31 foot) and over 20cm (0.66 foot) away for 15s	6,5
80.4	Twisted cap	If it hinders air tightness - operation – use	0,1
		If defect visible at more than 40cm (1.31 foot) away for 5s	1
		If defect visible at less than 40cm (1.31 foot) and over 20cm (0.66 foot) away for 15s	6,5
80.5	Reference mix of caps		1
80.6	Space between tube and cap	> 1mm (0.039 inches)	1
		>0,5 to ≤1mm (>0.020 to ≤0.039 inches)	6,5
		≤ 0,5mm (≤0.020 inches)	Acceptable

DEFECT CODE	DESCRIPTION OF DEFECT	SPECIFIC DETAILS	A.Q.L
<u>100</u>	<u>DISPENSER PUMP AND CAP DEFECTS</u>		
100.1	Missing metallization		1
100.2	Pump with alu body "rice grain": swing of the plastic over-cap		6,5
100.3	Pump with alu body "rice grain": Rotation of the plastic over-cap		Acceptable
100.4	Pump alu smooth body: iridescent of the over-cap		Acceptable
100.5	Pump 100% pasltic: steamed effect of the over-cap		Acceptable
100.6	Broken cap, Missing or excess material	If it hinders air tightness - operation – use	0,1
		If defect visible at more than 40cm (1.31 foot) away for 5s	1
		If defect visible at less than 40cm (1.31 foot) and over 20cm (0.66 foot) away for 15s	6,5
100.7	Creased, deformed cap	If it hinders air tightness - operation – use	0,1
		If defect visible at more than 40cm (1.31 foot) away for 5s	1
		If defect visible at less than 40cm (1.31 foot) and over 20cm (0.66 foot) away for 15s	6,5
100.8	Colour – Tone - Opacity (see note-4)	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
100.9	Scratches, marks	If defect visible at more than 40cm (1.31 foot) away for 5s	1

DEFECT CODE	DESCRIPTION OF DEFECT	SPECIFIC DETAILS	A.Q.L
<u>100</u>	<u>DISPENSER PUMP AND CAP DEFECTS</u>		
		If defect visible at less than 40cm (1.31 foot) and over 20cm (0.66 foot) away for 15s	6,5
100.10	Sink marks	If defect visible at more than 40cm (1.31 foot) away for 5s	1
		If defect visible at less than 40cm (1.31 foot) and over 20cm (0.66 foot) away for 15s	6,5
100.11	External inclusions (burnt material, bursts, gels, unmolten material).	SEE ACCORDING TO THE TABLE DEFINED IN NG: 332 - CONTROL OF THE CLEANING OF ITEMS	
100.12	Internal inclusions (burnt material, bursts, gels, unmolten material).	SEE ACCORDING TO THE TABLE DEFINED IN NG: 332 - CONTROL OF THE CLEANING OF ITEMS	
100.13	Rough edges	> 1mm (0.039 inches)	1
		>0,5 to ≤1mm (>0.020 to ≤0.039 inches)	6,5
		≤ 0,5mm (≤0.020 inches)	Acceptable
100.14	Outside injection point	> 1mm (0.039inches) with risk of injuring consumer	0,1
		> 1mm (0.039 inches) without risk of injuring consumer	6,5
		≤ 1mm (0.039 inches)	Acceptable
100.15	Inside injection point	Affects functionality	1
		Do not affect functionality	Acceptable
100.16	Bursts / Gases / Air bubble	If necessary, limits to be defined with a range board.	Acceptable

	TECHNICAL SPECIFICATIONS FOR IML ESTube PLASTIC TUBES	Code	E.00.00002
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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-3: The print quality (shininess) on matt finished caps is not included in this list of defects as it occurs as a result of the rough surface. In this case the seriousness of the defect is reduced by one level, i.e. critical to major, major to minor and minor to acceptable.

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

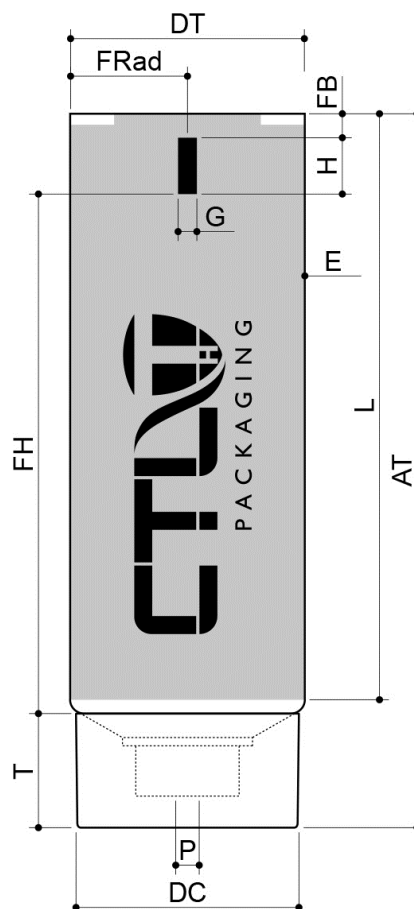
NG 313: DIMENSIONAL CHECK

OBJECT

The purpose of this standard is to determine the measurements and tolerances of tubes, caps and other components manufactured by the CTL-TH Packaging 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



ADMISSIBLE TOLERANCES

AT: Total height of tube.

L: Skirt length of tube.

<i>REFERENCE VALUES</i>		TOLERANCES (mm / inch)
Total height (mm / inch)	Length (mm / inch)	
AT ≤ 100 / 3.94	L ≤ 100 / 3.94	±1,5mm
AT > 100 / 3.94	L > 100 / 3.94	±1,5% of AT
		±1,5% of L

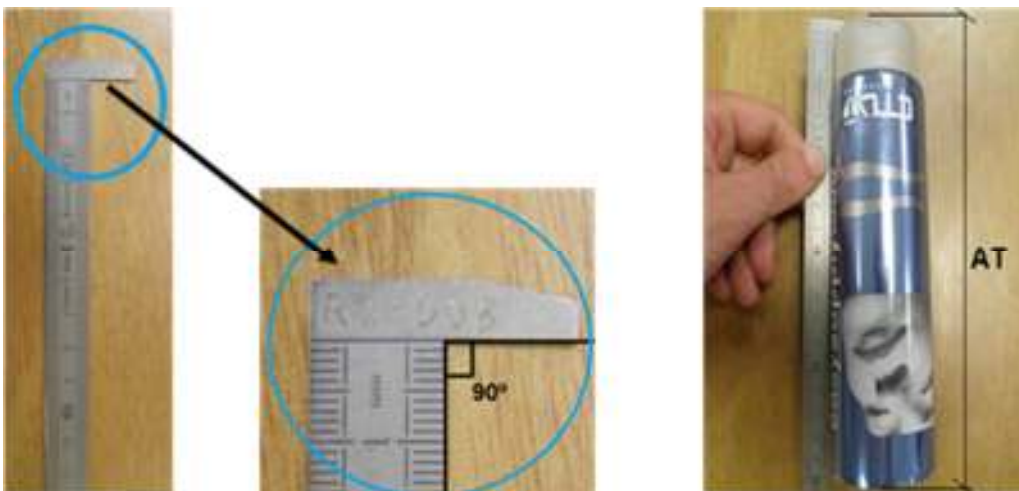
To check the total height (AT) of the tube, 2 methods can be uses:

- 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**:

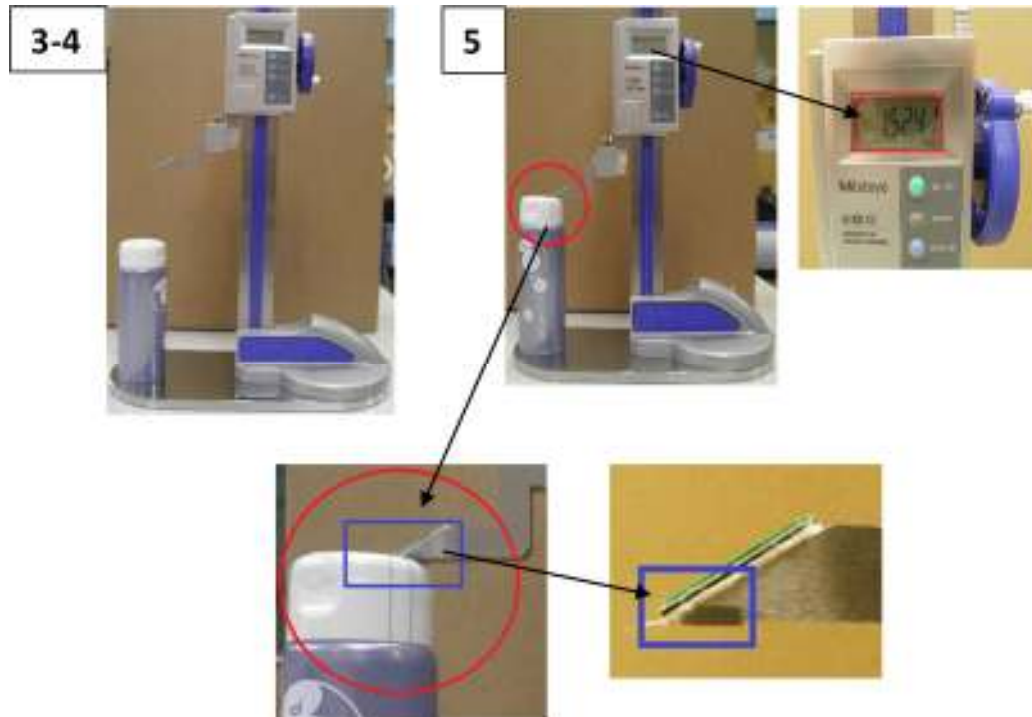
1. Take the vertical gauge as shown below.



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.



NOTE: For measurement of the total height (AT), where the cap is covered with a plastiband, it must first be removed.

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.

Dt: Inner diameter of the tube.

E: Thickness of the tube.

		NOMINAL DIAMETER (mm / <i>inch</i>)		Tolerances (mm/ <i>inch</i>)	THICKNESS*	Tolerances (mm / <i>inch</i>)
		DT	Dt		E*	
CYLINDRICAL, ELLIPTICAL AND ELLIPTOP TUBE	Ø35 / 1.38	Ø35,3 / 1,39	Ø34,3 / 1,35	± 0,3 / ± 0,01	0,47 / 0,02	± 0,05 / ± 0,00197
	Ø40 / 1.57	Ø40,3 / 1,59	Ø39,2 / 1,54		0,56 / 0,022	
	Ø50 / 1.97	Ø50,3 / 1,98	Ø49,1 / 1,93		0,59 / 0.0247	

• **OPERATING MODE**

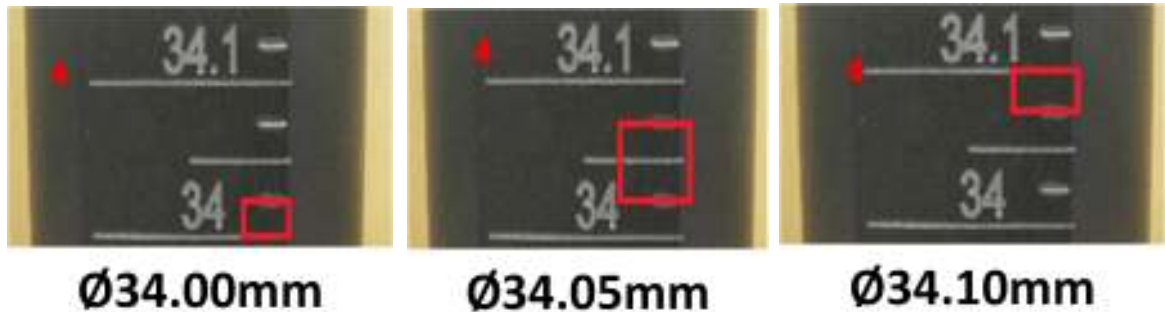
To check the conformity of the internal diameter of the tube (Dt):

1. Select the tester corresponding to the inner diameter to verify.
2. Enter the base of the tester into the tube and slide it **without forcing** until there is contact between tube and tester.
3. Drop tester and wait until it is in static position.
4. Check the value in the graduated scale of the tester.



Examples:

In the case that the base of the tube is between two positions, the measure is as follows:





To check the conformity of the thickness of the tube (E):

1. Take a micrometer and position it on the fixing support
2. Measure the base of the tube with the micrometer.
3. Measure the thickness in four points of the tubes (at $\pm 90^\circ$).



C: Perforated outlet opening for the product.

Type of product		Tolerances (mm/inch)
<p><u>Easysupplytube:</u> cylindrical and elliptical</p> 	Perforation Ø 0,50mm / 0.020inch a 2,00mm / 0.079inch	$\pm 0,25$ / ± 0.0098
	Perforation Ø 2,50mm / 0.098inch a 4,50mm / 0.18inch	$+0,25$ / $+0.0098$ $-0,40$ / -0.0016
	Perforation Ø > 4,50mm / 0.18inch	$+0,25$ / $+0.0098$ $-0,80$ / -0.0031
<p><u>Plastic caps:</u> In the case of caps that provide the said function.</p> 		$\pm 0,2$ / ± 0.0079

• **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.



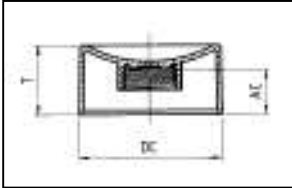
To check the conformity of the perforation of the orifice of the cap:



DC: Cap diameter.

T: Cap height.

AC: Closing height of cap.

Type of product		Nominal value (mm / inch)	Tolerances (mm / inch)
<p align="center"><u>PLASTIC CAPS</u></p> 	Cap diameter	Ø Cap ≤ 30 / 1.18	±0,3 / ±0.012
		Ø Cap > 30 / 1.18	± 0,4 / ±0.016
	Cap height	Ø Cap ≤ 30 / 1.18	±0,3 / ±0.012
		Ø Cap > 30 / 1.18	± 0,4 / ±0.016
	Closing height of cap	According to plan	±0,3 / ±0.012

- **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.

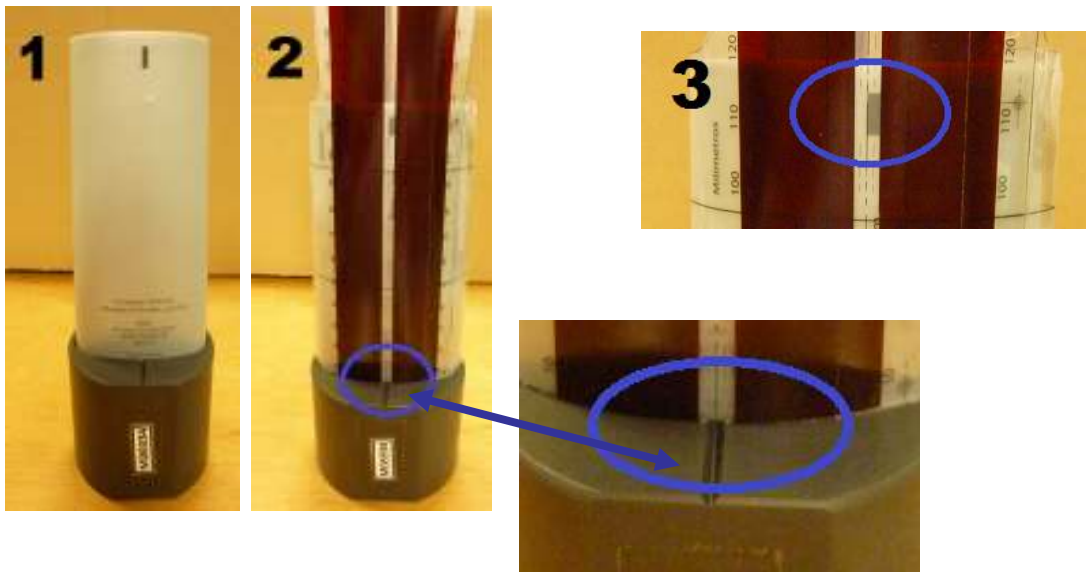
Variables a controlar		Tolerancias (mm / inch)
Eyemark position to base closing gap of the label (C1)		$\pm 1 / \pm 0.039$ with regard to specified value
Radial position of printing in relation to head (elliptical and elliptop) (C2)	E35	$\pm 1,5 / \pm 0.059$
	E40	
	E50	$\pm 2 / \pm 0.079$
Positioning between		
- inks (C3)		$\pm 0,2 / \pm 0.008$
- inks – Cold Stamping (C4)		
- Varnish – Varnish (C5)		X:0.35 (0.015) / Y:0.3 (0.01)
- Varnish – inks (C6)		
Print position on cap (C7)		$\pm 0,3 / \pm 0.01$ with regard to specified value
Value for printed band on caps (C8)		$\pm 0,3 / \pm 0.01$
Position of decoration on the top of the cap	Axial (C9)	$\pm 1 / \pm 0.039$ axis X
		$\pm 1 / \pm 0.039$ axis Y
	Radial (positop y elliptop) (C10)	$\pm 6^\circ$
Crenel (A)	Axial (A1)	+0.0/-0.4 / +0.0/-0.016 with regard to specified value
	Radial (A2)	+0.0/-1 / +0.0/-0.039 with regard to specified value

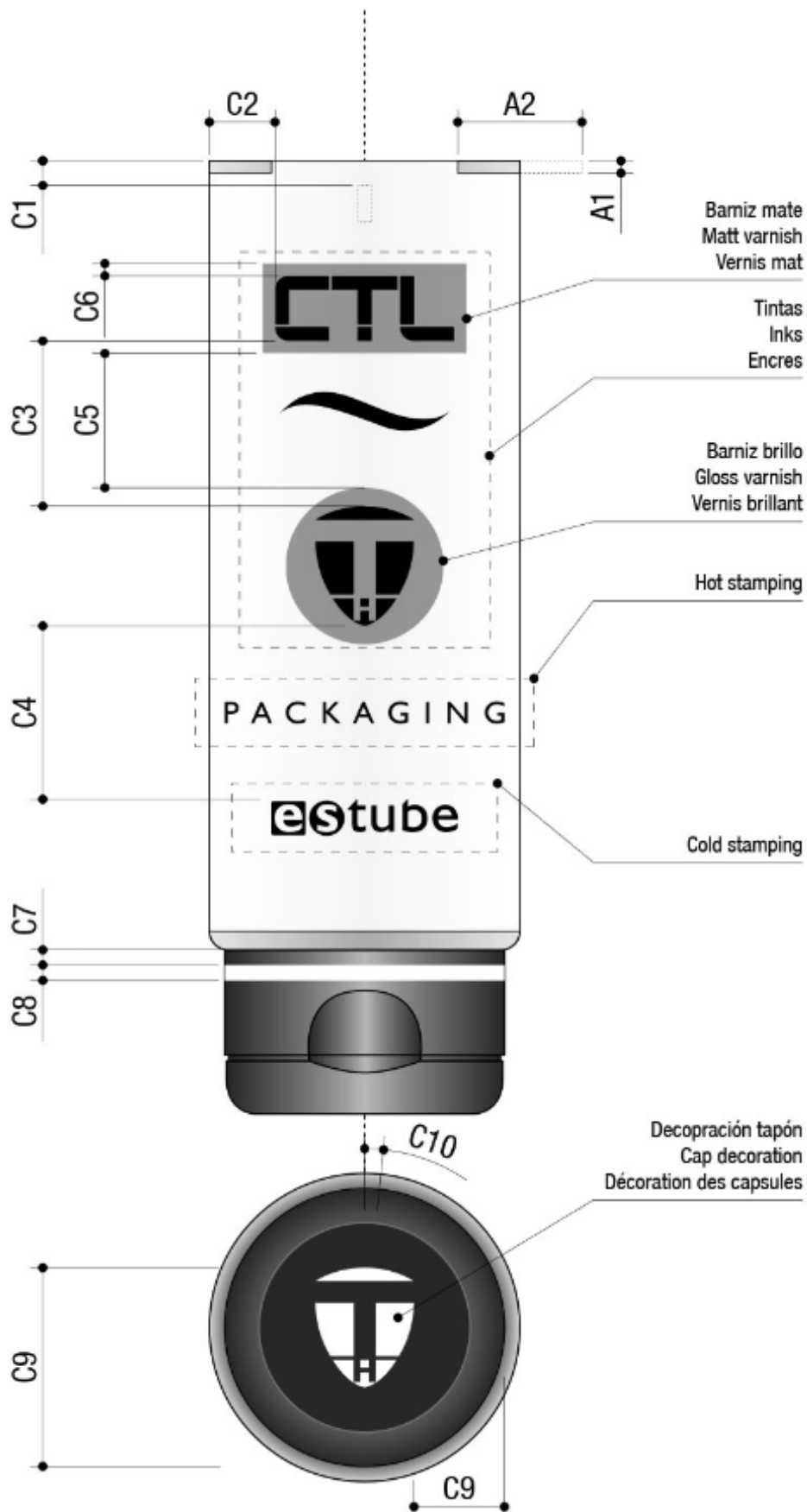
- **OPERATING MODE (for the C2 dimension)**

To check the conformity of the centring of the cap on the tubes Positop and Elliptop:

1. Select the graph calibre according to the theoretical external diameter of the tube.
2. Insert the tube of the calibre and centre the axis of the hinge (rear of the cap) inside the corresponding alcove of the calibre.



In the case of elliptical tubes (with their specific tool), verify that the central axis of the photocell is within the limits marked on the graph paper.





Centring of cap with the printing

For Positop / Elliptop caps, the maximum deviation between the axis of the hinge (cap's posterior side) and the printed spot is:

Type of product	Nominal value (mm / <i>inch</i>)	Tolerances (mm / <i>inch</i>)	
		98% of the lot	2% of the lot
Positop Tubes 	Ø35 / 1.38	±3 / ±0.12	±6 / ±0.24
	Ø40 / 1.57	±3 / ±0.12	±6 / ±0.24
	Ø50 / 1.97	±3 / ±0.12	±6 / ±0.24
Elliptop Tubes 	Elliptop 40 / 1.57	±1,5 / ±0.06	
	Elliptop 50 / 1.97	±2 / ±0.079	

- OPERATING MODE**

To check the conformity of the centring of the cap on the tubes Positop and Elliptop:

1. Select the graph calibre according to the theoretical external diameter of the tube.
2. Insert the tube of the calibre and centre the axis of the hinge (rear of the cap) inside the corresponding alcove of the calibre.
3. Check if the axis of the eyemark is inside the limits according to the Positop or Elliptop tube.



DEFORMATIONS:

Ovality

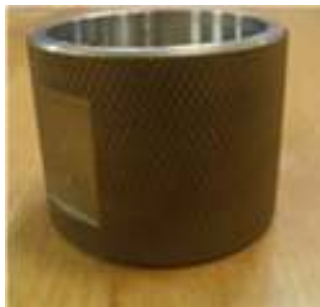
The following table shows in percentage (%) the complementary to the diameter size relative to the nominal size of the external diameter of the tube. The percentage increase varies depending on product type as shown in the following table:

Type of product	Tolerances
Cylindrical plastic tubes	10% of the outer diameter
Elliptical plastic tubes	12% of the outer diameter
Caps	5% of the outer diameter

• **OPERATING MODE**

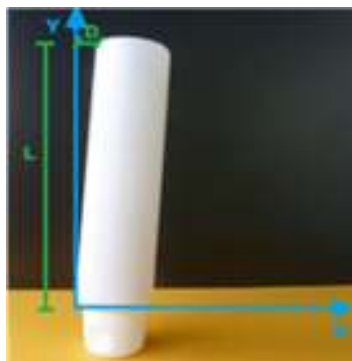
To check the conformity of the tubes when they suffer deformation:

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:

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



Dispenser pump (DOSITUBE)

The inclined angle of the fitted cap will be $X \leq 15^\circ$



The results of each of the characteristics mentioned in NG - 313 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 314: 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, Cold Stamping).
- **ADHESIVE TAPE 3M, REF. 810:** Adhesive tape used for specific hot-foil and customer hot-foil (copper, colour, Hot Stamping ...).

- 1- A strip of Scotch tape, 6cm / **0.20foot** 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 not be less than 1 minute (± 5 sec).
- 4- The tape is then pulled at one end to remove it quickly and abruptly, with an angle of 45°C.



• **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 or 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: Due to the composition of the holographic films, the water resistance is limited due to the presence of waxes in their composition. This resistance varies depending on the holographic decoration, but never reaches the resistance obtained with other traditional metallic films. However, we have verified that these films have a good resistance to contact with cosmetic products.

For this reason we advise against its use when the use of the container is going to be subject to the direct and continuous action of the water, as for example when it is used for the packaging of bath, shower or similar gels.

As a consequence of the above, the aforementioned water immersion resistance test will not apply when working with this type of film

NG 315: SEAL TIGHTNESS TEST

OBJECT

The purpose of this standard is to check the seal tightness of the tube-cap assembly.

TESTS:

The following tests form part of this standard:

- **Tube with cap:**
 - *Tube without tamper evidence*
 - *Tube with tamper evidence*
- **Tube with Dositube dispenser pump.**

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 test is performed **without** plastiband, so it must be removed if exists.
2. The tube-cap assembly is placed into the vessel of water, ensuring that cap is completely immersed.
3. 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.





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

Tube with tamper evidence

1. The test is performed **without** plastiband, so it must be removed if exists.
2. Firstly, the same test as described before is done with both the tamper evidence and the cap.
3. Secondly, the tamper evidence is removed.
4. Then the cap is screwed on at the minimum torque setting, defined in the table in standard 316, with an additional 1 kpxcm*.
5. Finally, the same trial is done again without the tamper evidence and with the cap.



* 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 316.

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

Results:

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

TUBES DOSITUBE:

• Material:

The material employed in this test includes:

- Vacuum bell jar, with absorbent paper inside.
- Demineralised water coloured with 2 drops of red and oil free stamp ink per litter of water (e.g. Pelikan brand Ref. 35247).
- Hot-air sealing machine.
- Samples of finished plastic tubes with caps fitted.
- Chronometer.

• Operating mode:

Tube Dositube.

- 1- Fill the tubes approximately at the nominal weight with the coloured water in order to fully immerse the pump's mechanism when the tube is in vertical position.
- 2- Seal the tubes according to method NG 319 (removing the over-caps of the Dositube)
- 3- Leave the tubes without priming the pump on an absorbent paper head in the vacuum bell jar at a relative pressure (ΔP) of $- 800$ mbar (± 50 mbar) or $- 0,8$ bar (± 0.05 bar) for 5 minutes (± 1 min).



• Results:

The test is considered conform if, by the end of the test, no coloured water is found on the on the absorbent paper.

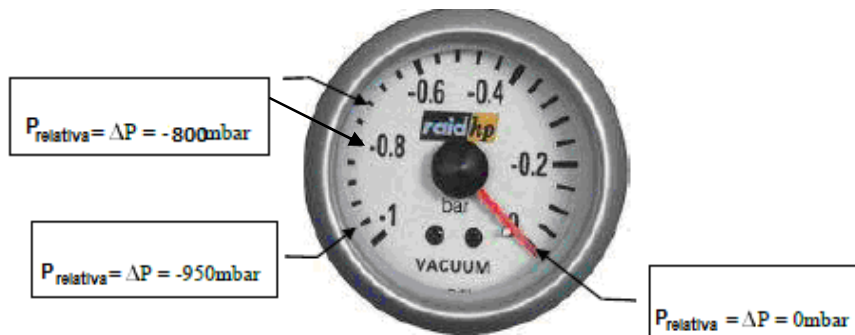
RECOMENDATIONS FOR USE:

In this test, we measured the depression suffered in a vacuum chamber. In the example shown below, we observed, depending on the pressure gauge used, we must take into account the absolute pressure or depression which is obtained according to the said absolute pressure:

- **Considering absolute pressure:** Pressure inside the vacuum bell jar.



- **Considering the relative pressure or depression:** pressure difference between the atmospheric pressure and the pressure inside the vacuum bell jar.



NG 316: 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 315 “seal tightness” is applicable.

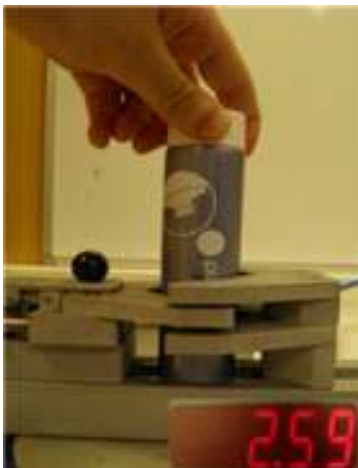
MATERIAL

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 DES VALEURS DES COUPLE DE DEVISSAGE (kgf x cm)						
Head	THREAD				ELLIPTIQUE		
	22TL - PP	8 - PP (M8)	15 - PP (M15)	Sweet Line 16	E 35 - PP	E 40 - PP	E 50 - PP
Ø35 / 1,38 in		2 10	2 10	1.5 6	1 6		
Ø40 / 1,57 in		2 12	2 12			1 7	
Ø50 / 1,97 in	2 12						2 14

NG 317: 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 demineralised water.
- Samples of finished plastic tubes with caps fitted.
- Hot-air sealing machine.
- Drying oven (at 55°C).
- Chronometer.
- Vessel.

OPERATING MODE

1. In case that the tubes are with pumps or beautytube applicators, first ensure contact of the surfactant with the components that come in contact with the product. Therefore, in these cases, the first step is:

- **For pumps**: prime the pump and perform 10 dosis
- **For beautytube applicators**: use performing 10 moves with the applicator.

Once wetted parts that come in contact with the product, we proceed to perform monitoring defined below:

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



3. 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 319.

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.

4. 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.

For assembly tube-pump dositube, the test is considered conform if, after performing 5 doses, the pump works properly without showing any indication of deterioration.

NG 318: HEAD BODY WELD STRENGTH TEST

OBJECT

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

MATERIAL

The material employed in this test includes:

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

OPERATING MODE

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

- $\varnothing < 40\text{mm} / 1.57 \text{ inch}$ → 2 cuts

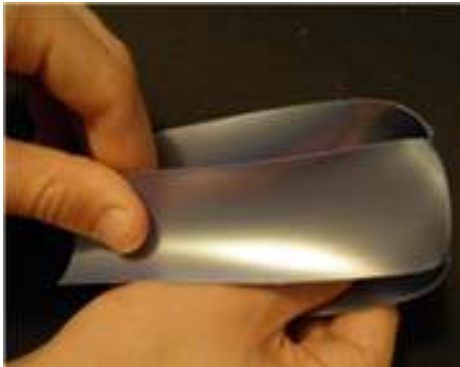


- $\varnothing \geq 40\text{mm} / 1.57 \text{ inch}$ → 3 cuts



- **Elliptical tubes** → 4 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 319: SIDE STRENGTH OF SEALED TUBES BURST TEST

OBJECT

The purpose of this standard is to determine the burst resistance of sealed tubes.

MATERIAL

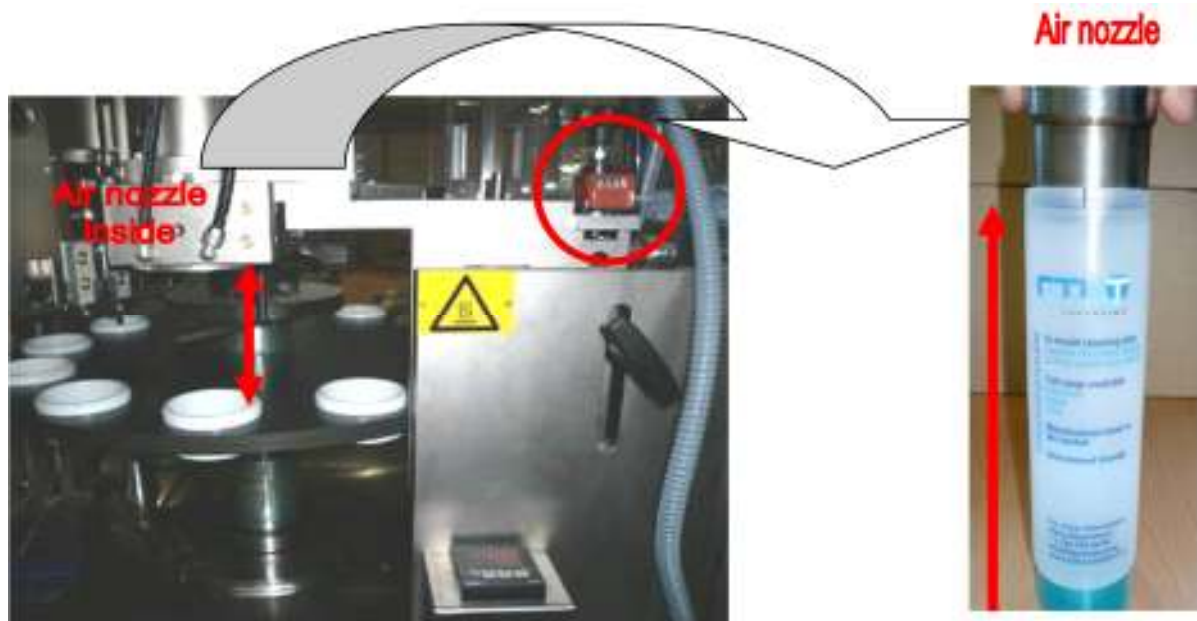
The material employed in this test includes:

- Hot-air sealing machine.
- Samples of finished tubes.
- Air pressure machine.
- 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 (Sealing machine with hot air according to the guide “X.00.00009 – Recommendation – Hot air sealing”).



2. Then pump air inside the tube to a pressure of 1.5 bar (± 0.05 bar) for 10 seconds (± 5 sec).



RESULTS

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

NG 320: BARCODE READING TEST

OBJECT

The purpose of this standard is to determine the integrity of the barcode printed on the tube by means of a barcode reading exclusively for GS1 barcodes that meet EAN 13, EAN-14, UPC A, UPC E (does not apply for example to labels for packaging, shipping, delivery notes document labels,...).

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 321: 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 in an upward direction steadily 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 322: FATIGUE RESISTANCE FOR FLIP-TOP LIDS

OBJECT

The purpose of this standard is to measure the number of open/close operations a cap can withstand before one or several of the joint elements between the lid and the base of the cap break fully or partially.

MATERIAL

The material employed in this test includes:

- A test machine designed at the CTL-TH Packaging Group is used to carry out this test, basically comprising of a rigid support (onto which a tube with the cap to be tested is placed) and a pneumatically operated mechanism to create the opening/closing action.
- A counter allows a preset number of operations to be done and show the overall number of cycles carried out during the test.
- A pressure regulator allows the applied opening force to be adjusted during the test.
- Samples of finished plastic tubes with caps fitted.

OPERATING MODE

The conditions necessary to carry out this test correctly are:

- Lid opening angle 150°.
 - Open/close speed set at a frequency of 60 cycles/min.
 - Opening is done by pulling tangentially on the protruding midpoint of the nail slot until the lid is opened to the aforementioned 150°.
1. In case of caps with tamper evidence, this one must previously be removed.
 2. The test begins by placing the tube-cap assembly into the chuck which acts as a support.
 3. The assembly is secured by means of a locating screw. The locating screws for the lid are adjusted accordingly.
 4. The counter is set to 100 test cycles and the air pressure for the test machine is set to 3 kp/cm².
 5. The test is taken as finished once the 100 programmed opening operations are concluded. In order for test to be considered satisfactory



RESULTS

The test is considered conform if none of the joint elements between the lid and the base as shown in the following tables:

DESCRIPTION OF DEFECT	SPECIFIC DETAILS		A.Q.L
Broken hinge	2 out of 3 broken hinges	1 lateral and central	0,1
		2 laterals	6,5



DESCRIPTION OF DEFECT	SPECIFIC DETAILS	A.Q.L
Broken hinge	Central broken hinge	1
	1 lateral broken hinge	6,5
	None of the 3 hinges broken	Acceptable



NG 323: OPENING FORCE TEST FOR FLIP-TOP LIDS

OBJECT

The purpose of this test is to measure the force that has to be applied to the nail slot in order to open a flip-top lid. The 1st dry opening is understood as opening a cap that has had no previous contact across the outlet opening for the product contained inside the tube.

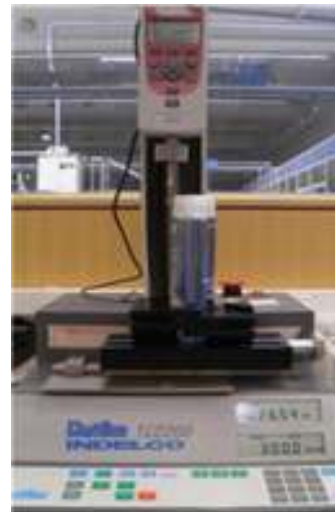
MATERIAL

The material employed in this test includes:

- A Traction tool.
- Samples of finished plastic tubes with caps fitted (at least one day before the test).
- Chuck.
- Charge cell.

OPERATING MODE

1. In case of caps with tamper evidence, this one must previously be removed.
2. The tube-cap assembly is secured in a vertical chuck-support.
3. Next, the position of the support slide is adjusted to the height of the load arm so that the end of the arm is below the protruding edge of the lid.





4. The lid is opened by pulling on the protruding midpoint of the nail slot in parallel to the axis of the chuck-support at a speed of 300 mm/min.
5. Once the elements have been correctly positioned, the test begins and the load arm automatically makes a vertical movement.

The opening force for the lid is displayed on the screen.

RESULTS

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

OPENING FORCE LIMIT VALUES (Newton)	
Reference	1st dry opening
19.35/20L-00 PX y 19.35/21L-00 PX	14 ± 8
19.40/20L-00 PX y 19.40/21L-00 PX	
E-15.40/21-00 PX	
23.50/20L-00PX y 23.50/21L-00 PX y 23.50/20L-00TE	30 ± 15
E-18.50/21-00 PX	18 ± 10

NG 324: 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 332.
- 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.

- **A system:** Grouping fabrications of labels, point of order.

Number of tube units	Percentage of variation
< 10.000	-0 % + 10%
De 10.001 a 30.000	-0 % + 5%
De 30.001 a 50.000	-0 % + 3%
De 50.001 a 100.000	-0 % + 2%
> 100.001	-0 % + 1%

- **B system:** Fabrications of labels for each order.

Number of tube units	Percentage of variation
Up to 5,000	-3% + 12%
From 5,001 to 10,000	-2.5% + 10%
From 10,001 to 30,000	-1% + 10%
From 30,001 to 50,000	-0% + 8%
From 50,001 to 80,000	-0% + 7%
From 80,001 to 100,000	-0% + 6%
From 100,001 to 200,000	-0% + 4%
From 200,001 to 500,000	-0% + 3%
From 500,001 to 1,000,000	-0% + 1%

STANDARD PACKAGING COMPONENTS

PALLET	800 x 1200 EUR
TRAY	Made up of a base and cover, the outer dimensions of which must not exceed 600 x 400 mm / 23.62 x 15.75 inch.
PLASTIC BAG	Placed on the inside of the tray covering tubes.
PLASTIC SHEET	Covering the pallet
PLASTIC SHEET	Covering the trays or boxes stacked on the pallet.
STRETCH FILM	Outer covering for the pallet + trays or boxes
LABELLING	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).

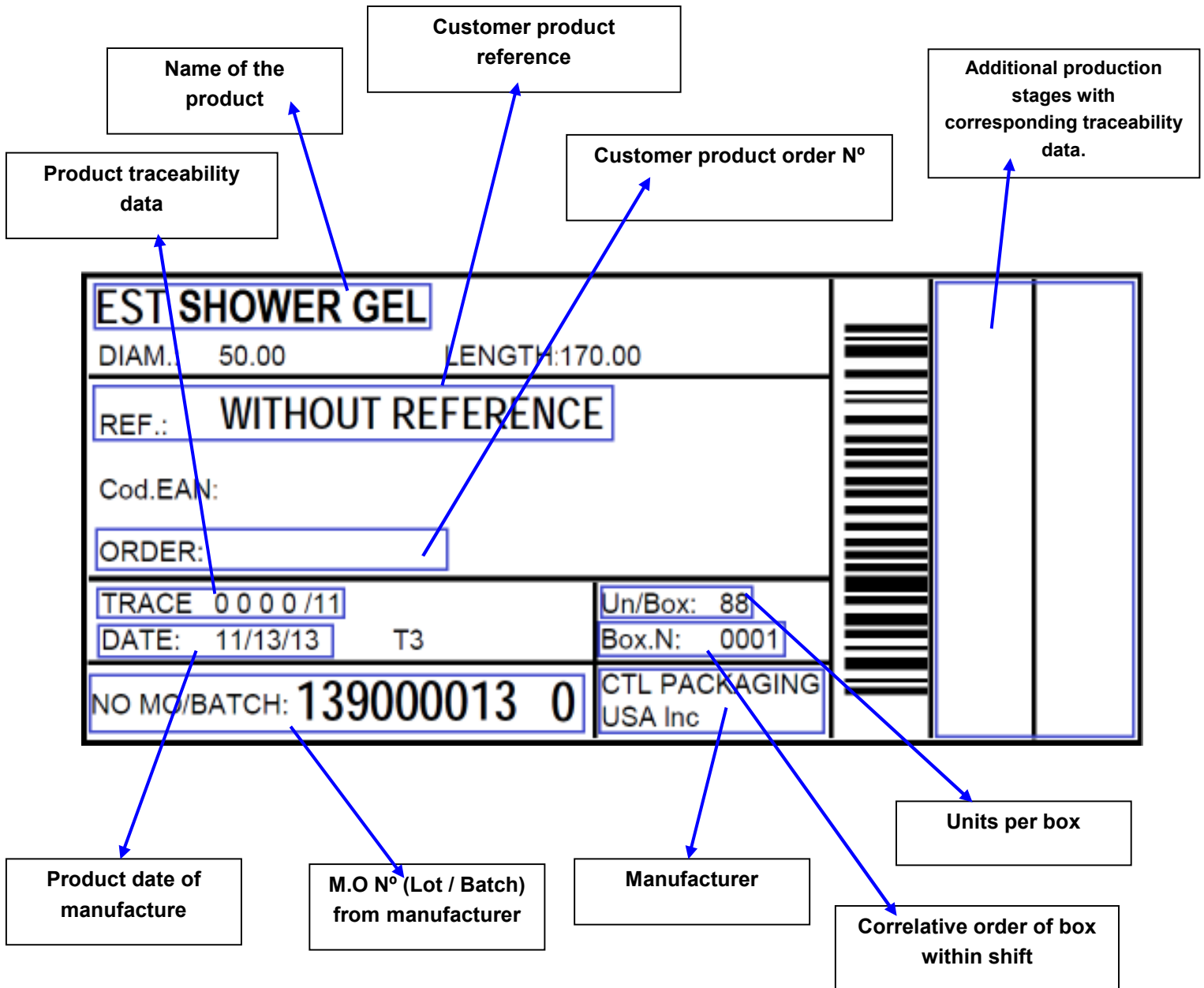
1,200 mm / 0.047 inch
2,150 mm / 0.085 inch

NOTE: For container shipment, the maximum height is 2,150 mm / **0.085 inch**

LABELLING OF THE PRODUCT

A) IDENTIFICATION & TRACEABILITY LABEL

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





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B) SHIPMENT LABEL

The diagram shows a shipment label with various fields and callouts. The fields are:


- Shipper:** CTL PACKAGING SAS, ROUTE DE SAINT POURCAIN, 03110 CHARMEIL
- Goods:** T.PLAST.CILING
- Warehouse date:** 14/11/13 T1
- Production date:** 11/02/08
- Production site:** 2
- N° OF (lot):** 200711521 0
- Address:** TUBOPLAST HISPANIA, S.A
- Address:** 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
- Quantity:** 2640
- Barcode 1:** (11)080211(37)2640
- Barcode 2:** (00)384352236000046361(10)2007115210

Callouts on the left side:

- Shipper
- M.O N° = Lot / Batch
- Recipient
- Product order N° (from customer)
- Palet Identifier
- Name of the product
- Number of units per box

Callouts on the right side:

- 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

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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).





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DELIVERY DOCKETS

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

<i>DELIVERY DOCKET</i>	Delivery docket N° M.O N° Customer ID N° Delivery docket date Delivery address - Customer - Address - City / Post Code - Province - Country Form of shipment (transport) Carriage (paid/due) Product order N° (from customer) Product reference (from customer) N° of packages Quantity (tubes, boxes, pallets) Item (product, box, pallet) Invoice address - 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 / 15.75 inch

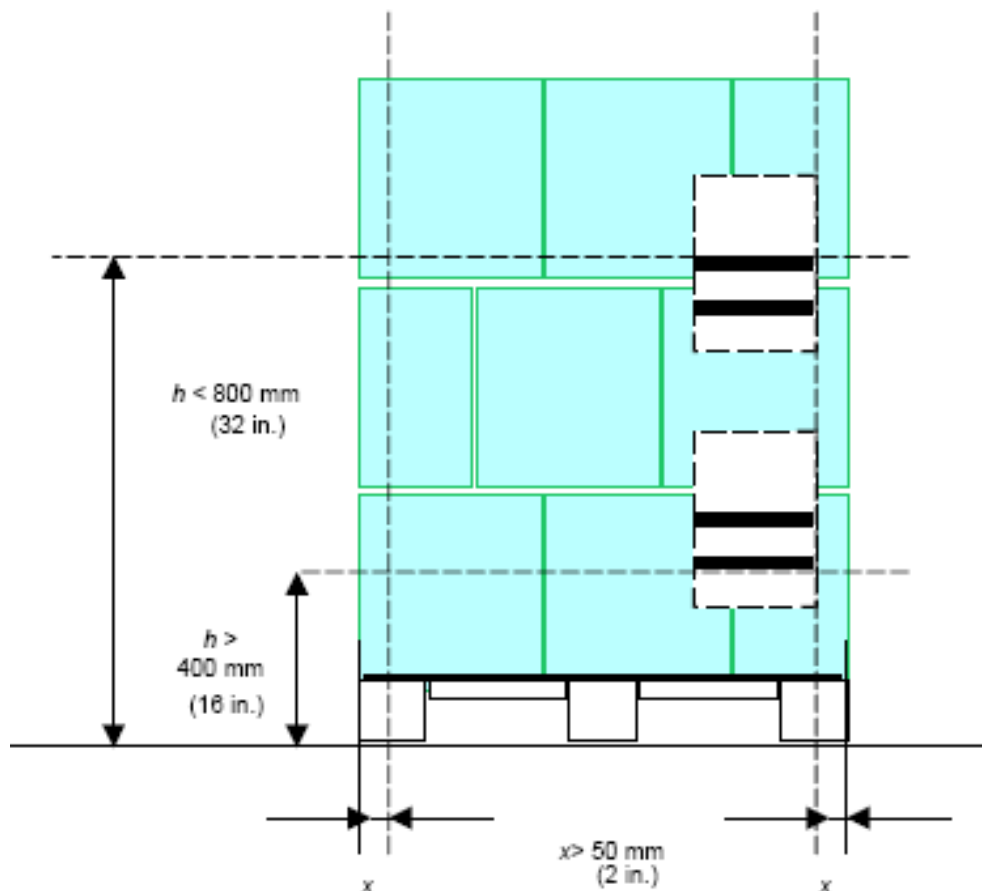
The labels must be positioned as high as possible, without the position hindering the reading of the labels.

They must not be placed less than 50 mm / **1.97 inch** from the vertical edge.

Pallets greater than 400 mm / 15.75 inch

The labels must be placed at a height of 400 to 800 mm / **15.75 to 31.5 inch** from the base of the pallet.

They must not be placed less than 50 mm / **1.97 inch** from the vertical edge.



NG 325: BREAK STRENGTH THROUGH TWISTING TEST FOR FLIP-TOP LIDS

OBJECT

The purpose of this standard is to determine the breaking torque when twisting the hinge on flip-top lids.

MATERIAL

The material employed in this test includes:

- Torque meter.
- Flip-Flop lids.

OPERATING MODE

1. In case of caps with tamper evidence, this one must previously be removed.
2. Open the lid to be tested.
3. Attach the lid to the torque meter as shown in the photo and set the torque meter to zero



4. Turn the lid, following the movement shown in the photo, until the first sign of a break appears.

RESULTS

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

REFERENCE	Kgf x cm
19.35/20L-00 PX y 19.35/21L-00 PX	≥ 4
19.40/20L-00 PX y 19.40/21L-00 PX	
E-15.40/21-00 PX	≥ 6
23.50/20L-00PX y 23.50/21L-00 PX y 23.50/20L-00TE	≥ 3
E-18.50/21-00 PX	≥ 5

NG 326: 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.
- For Dositube and tubes with the assembly “cap-cover”, tape that resists to traction forces (e.g. 3M Scotch 616).

OPERATING MODE

Compression test:

Tubes with hinges and Dositube

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.



Traction test:

Dispenser pump – Dositube pump, *Over cap for Dositube* and assembly “cap-cover”

1. Proceed to affix the tape around the piece to be tested, as shown in the photo
2. The tube is placed in the mandrel - Vertical and immobilized on the same support.
3. Then align the carriage and the load arm on the same axis.
4. Once those elements are properly aligned, start the test. The load arm automatically vertically goes up to disassemble the parts.
5. Read the value of the force disassembly on the screen.



Note: New samples must be taken for each of the 3 trials.

RESULTS

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

POSITOP / ELLIPTOP TUBES and push on heads

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

TUBES with assembly “cap-cover”

	Disassembly force (N)	Trial speed (mm/min)
Tube assembly “cap-cover”	> 100	100

DOSITUBE TUBES

- **Over-cap – Pump Dositube**

	Disassembly force (N)	Trial speed (mm/min)
Over-cap 100% plastic type <ul style="list-style-type: none"> ○ Ø 25 y 30 (SMART REX LOTION) ○ Ø 35 (BODY REX) 	≥ 5 ≥ 10	100
Over-cap pump PZ2 – PZ3 ring Ø 30 and Ø 38	≥ 10	100
Over-cap for alu smooth body (CAP ALU INSERT/TRIANG)	≥ 1 ≤ 25	175
Over-cap for alu body “grain rice” (CAP PLASTIC)	≥ 2 ≤ 27	300

- **Dispenser pump – Dositube pump**

	Disassembly force (N)	Trial speed (mm/min)
Dispenser pump	≥ 5	100

- **Pump – Dositube tube**

	Disassembly force (N)	Trial speed (mm/min)
Plastic pump	≥ 60 (48H del montaje) ≥ 30 (> 48H del montaje)	100
Pump with metallic over-cap	≥ 80	100
Pump PZ2 – PZ3 ring Ø 30 and Ø 38	≥ 80	100

NG 327: PLASTIBAND POSITIONING TEST

OBJECT

The purpose of this standard is to establish the limits for the radial and vertical positioning of the plastiband.

The radial position is determined by a theoretical axis shown in the following diagrams:

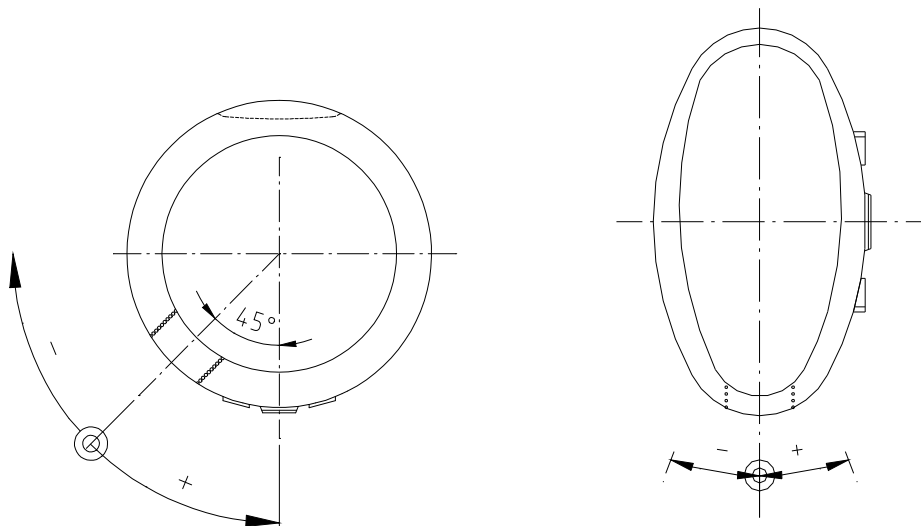
TESTS

The following tests form part of this standard:

- Radial position.
- Vertical position.

RADIAL POSITION

The radial position is determined by a theoretical axis shown in the following diagrams:



• **Material:**

The material employed in this test includes:

- Go – No go gauge.
- Caps with plastibands.

• **Operating mode:**

The cap is placed and positioned correctly on the Go/No go gauge, with the centre line of the micro perforation situated in the open sight on the gauge.



• **Results:**

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

REFERENCE	TOLERANCES (mm/inch)
19.35/20L-00 PX y 19.35/21L-00PX	+15 / +0.59 -8 / -0.31
19.40/20L-00 PX y 19.40/21L-00 PX	+17 / +0.67 -9 / -0.35
E-15.40/21-00 PX	+6 / +0.24 -6 / -0.24
23.50/20L-00 PX y 23.50/21L-00 PX y 23.50/20L-00TE	+20 / +0.79 -11 / -0.43
E-18.50/21-00 PX	+10 / +0.39 -10 / +0.39

VERTICAL POSITION

• **Material:**

The material employed in this test includes:

- Caps with plastibands.

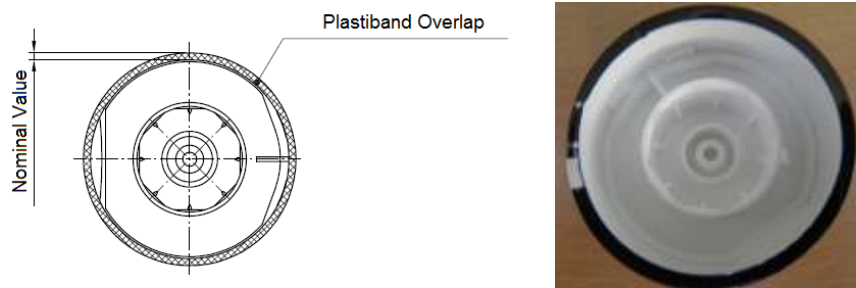
• **Operating mode:**

Check visually the overlap and plastiband eyemark.

• **Results:**

The test is considered conform if:

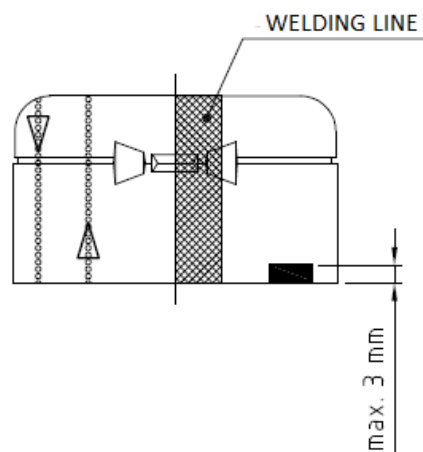
- The sealing band must overlap at least $\frac{3}{4}$ the base of perimeter of the cap to ensure that it is held on correctly.



- If so, the nominal value of the overlap must be within the tolerances specified in the table below:

Reference	Minimum value (mm/<i>inch</i>)	Maximum value (mm/<i>inch</i>)
Cylindrical caps	0.5 / 0.020	3.5 / 0.14
Elliptical caps	0.5 / 0.020	4 / 0.16

- In case the plastiband includes an eyemark, it must be at a distance ≤ 3 mm from the base of the cap as shown in the following diagram:



- In case the aspects mentioned above are not met, the classification of defects is contained in the following table:

DESCRIPTION OF DEFECT	SPECIFIC DETAILS	A.Q.L
Plastiband positioning out of tolerances	The plastiband can easily be removed by hand or during filling	0,1
	The plastiband cannot easily be removed.	1
	Only aesthetic	6,5

NG 329: 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, 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).

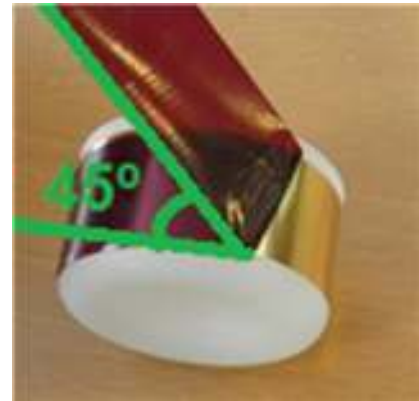
• **Operating mode:**

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 / **0.20 fouts** 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 (± 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

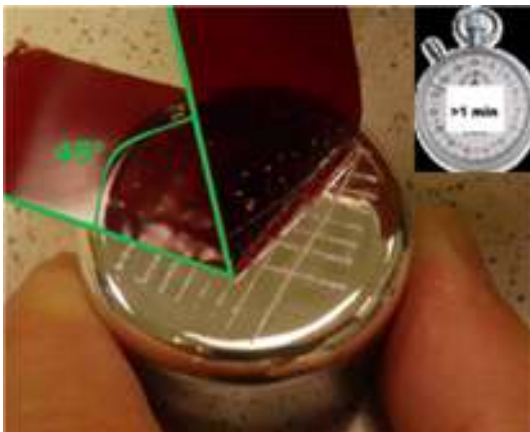
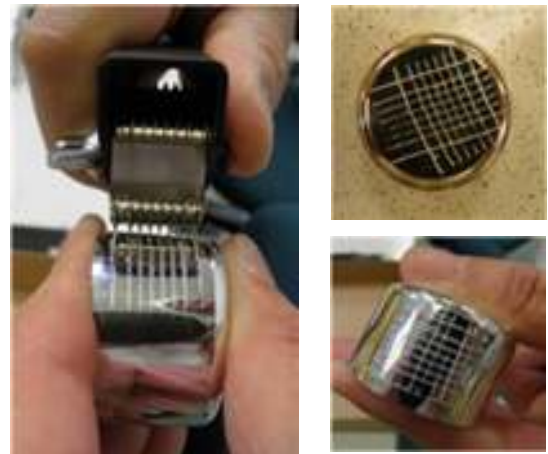
• Material:

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) or Cutter.
- Caps metalized or galvanized.
- Chronometer.

• Operating mode:

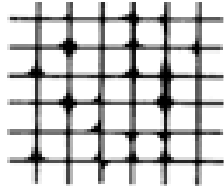
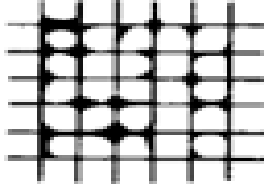
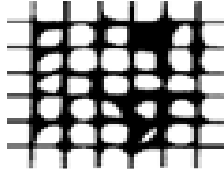
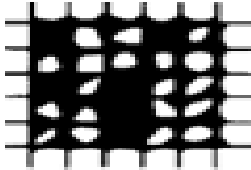
- 1- Utilising the grid comb or a Cutter, make both a radial and top grid pattern on the cap.
- 2- Use a clean cloth on the gridded surface to remove residue



- 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

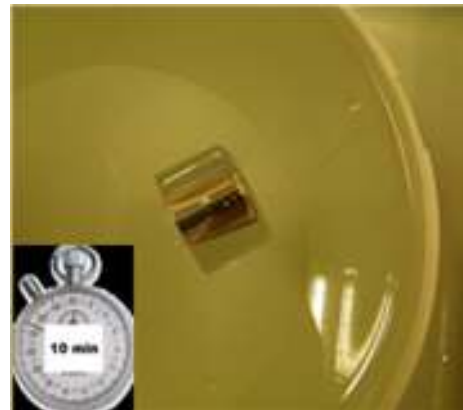
• Material:

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..

RESISTANCE TO ABRASION – LINEAR ABRASION TESTING MACHINE.

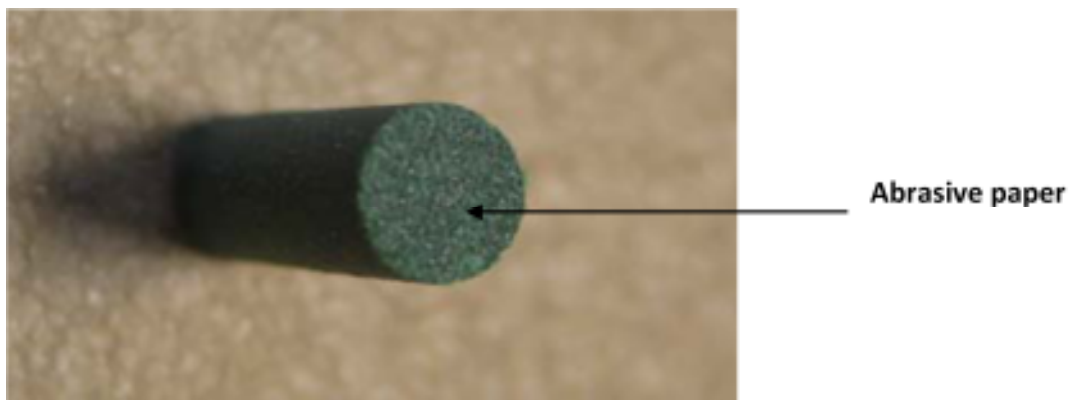
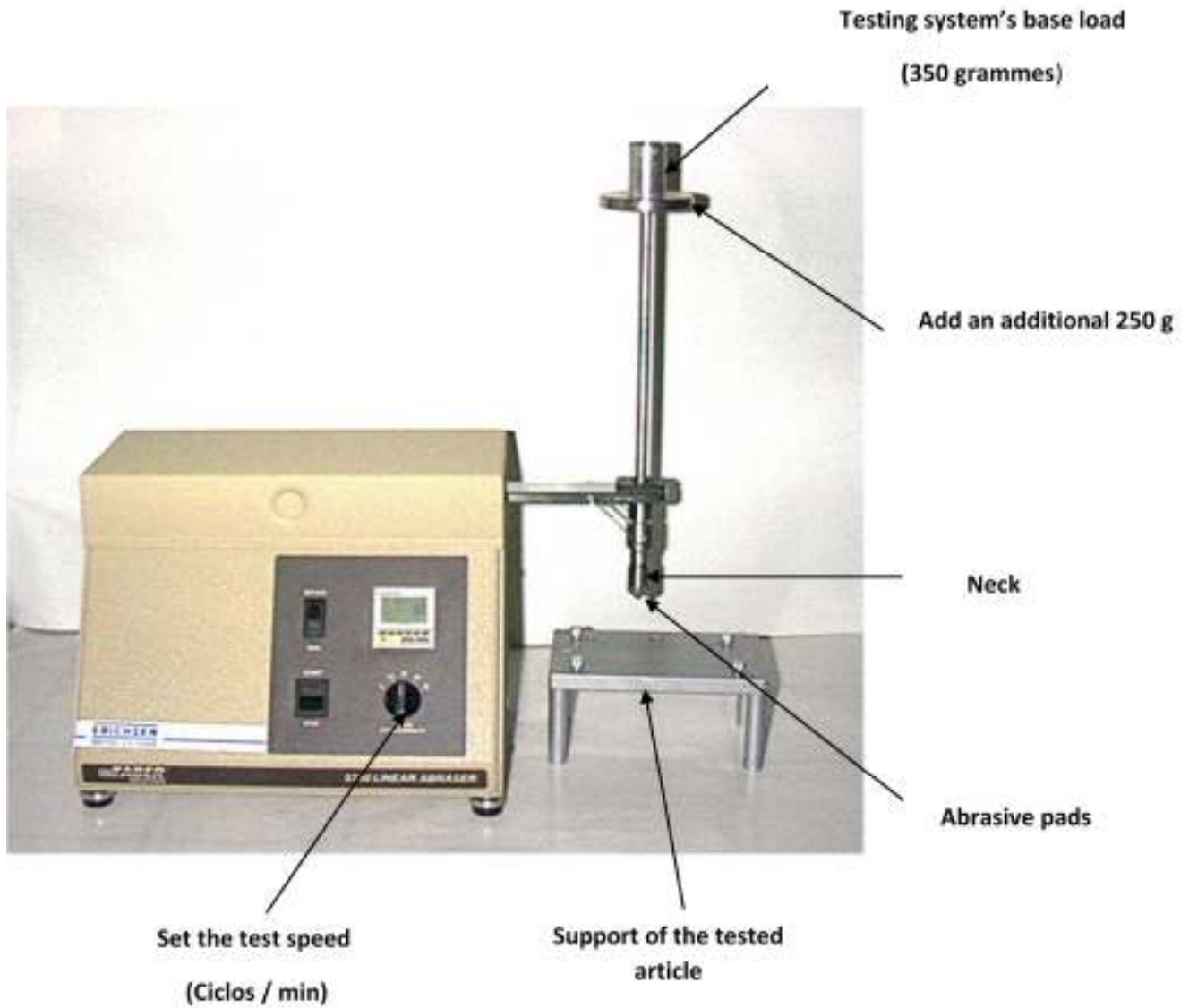
• Material:

The material employed in this test includes:

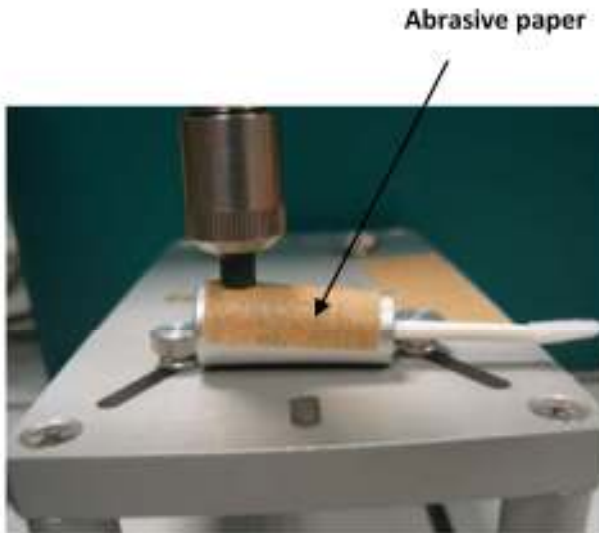
- Test instrument: Linear abrasion tester (e.g.: TABER INDUSTRIES distributed by ERICHEN)
- Add an additional 250g / **8.82 ounce**
- CS 10, 1/4 "diameter abrasive pads.
- Abrasive paper for the pad.
- Decorated caps.

• Operating mode:

1. Add an additional 250g / **8.82ounce** to the testing system's base load, which is 350g / **12.35ounce**, obtaining a total abrasive load of 600g / **21.16ounce**.
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.



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 or 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 330: PRIMING AND DOSAGE TEST FOR DISPENSING PUMPS

OBJECT

The purpose of this standard is to check priming and dosing functions of the Dositube tubes.

MATERIAL

The material employed in this test includes:

- Demineralised water.
- Weighing scale of 0,1g / **0.0035ounce**.
- Hot-air sealing machine.
- Container for collecting the dispensed demineralised water.
- Samples of finished Dositube tubes with caps fitted.

OPERATING MODE

A) *Priming test for dispenser pumps*

- 1- Fill the tubes with demineralised water until 2,5 - 3cm / **0.98 – 1.18 inches** from the base and seal them.



- 2- Slant the tubes at 45° angle, with the head facing up.
- 3- Proceed to count the number of dosing cycles needed to bring the first drop of water out. Each cycle is done manually in a slow, regular fashion with a full pump stroke.

B) Dosage test for dispenser pumps

Using the same tubes as the previous trial, keep on pumping 5 times (without weighing) in order to reach an optimum working of the pump.

1. Weigh the assembly tube-pump-cover positioning it as shown in the picture.
2. Before removing the assembly tube-pump-cover from the scale, set it to 0.
3. Maintain the tube-pump assembly head up at an angle of approximately 45° and proceed to manually pump a further 10 doses which are deposited into the container. Each cycle is done manually in a slow, regular fashion with a full pump stroke, making sure not to squeeze the tube when the pushbutton is pressed (to prevent an exaggerated dose).
4. Weigh again the assembly
5. The result on the scale is the total weight loss of 10 doses.



RESULTS

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

Pump mechanism used	Number of priming cycles	Weight of 10 doses (grams) (*)
Motor PZ3 crema 450µl	≤ 10	≥ 3,60 grs. y ≤ 5,40 grs.
Motor PZ3 crema 250µl	≤ 10	≥ 2 grs. y ≤ 3 grs.
Motor PZ2 spray 190µl	≤ 10	≥ 1,5 grs. y ≤ 2,3 grs.
Motor PZ2 spray 290µl	≤ 10	≥ 2.3 grs. y ≤ 3.5 grs.

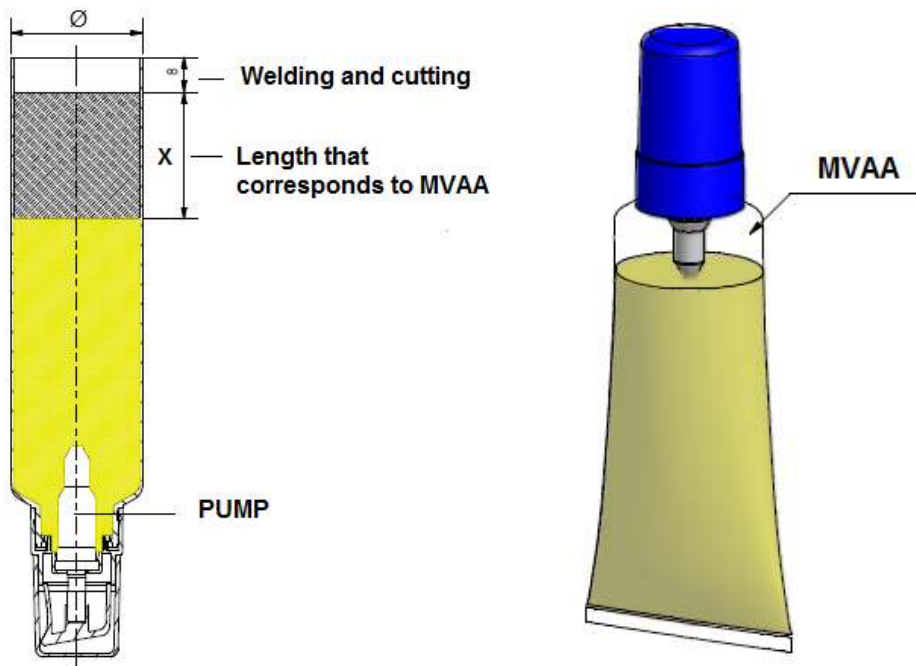
(*) The dose results are only valid for water. They will differ with dispensed products provided by the customer.

RECOMMENDATIONS OF USE:

CAUTION: This document is only a recommendation for tests with water. For other liquids, the client (with his machine) must regulate the filling and check the correct operation.

Maximum volume of air allowed (MVAA)

To guarantee the good performance of the Dositube Tube, the pump must be always be immersed in the product as shown in the following drawing.



The following table shows the relation between the different diameters (\varnothing) of the Dositube pumps and the maximum volume of permitted air (VMAP).

\varnothing (mm / inch)	X (mm / inch) = MVAA
$\varnothing 35$ / 1.38 in	28-30 / 1.1-1.18 in
$\varnothing 40$ / 1.57 in	28-30 / 1.1-1.18 in
$\varnothing 50$ / 1.97 in	34-36 / 1.34-1.42 in

NG 331: INTER-TUBE SLIDING CHECK

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 332: 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.I
			No. PARTICLES	PARTICLE SIZE	
<u>332</u>	<u>CLEANLINESS</u>				
332.1	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
			≤ 0,2 mm	Acceptable	
			≥ 3 Particles	> 1 mm	0,1
				0,2 mm > X ≤ 1 mm	1
		≤ 0,2 mm		6,5	
		<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
			≤ 1 mm	Acceptable	
			≥ 3 Particles	> 1 mm	0,1
				1 mm > X ≤ 2 mm	1
		≤ 1 mm		6,5	
Insects, foreign bodies				0,1	
332.2	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
		≤ 1 mm	Acceptable		
		Insects, foreign bodies			

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 / **1.85 in** 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 / **0.53 ounces**
 - Papain soy peptone 5.0 g / **0.18 ounces**
 - Sodium Chloride 5.0 g / **0.18 ounces**
 - Agar 15.0 g / **0.53 ounces**

- **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.

1. Fill in each item with the liquid nutrient medium Eugon LT100 to a quarter of its capacity and at least with 10 ml / **0.34 oz** 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 / **0.34 oz**, 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 333: 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 / **0.00035 ounces**).



OPERATING MODE

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



RESULTS

The weight is measured as indicative and informative.

NG 334: CONTROL OF THE BREAKING FORCE OF THE FIRST UTILIZATION SEALING CAP "SAFETOP"

OBJECTIVE

The purpose of this standard is to describe the systematics used for measuring the breaking force of the first-use seal of the Safetop plugs, including the limits of acceptability.

MATERIAL

The material used to perform the test consists of:

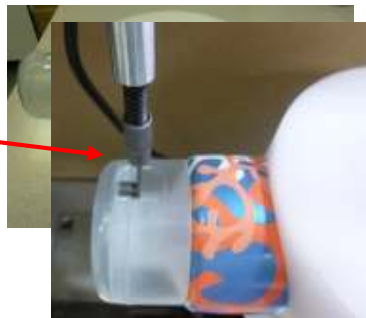
- A traction machine
- Sample assembled and finished plug tube set (at least one day before the test)
- Mandrels
- Load cell

OPERATING MODE

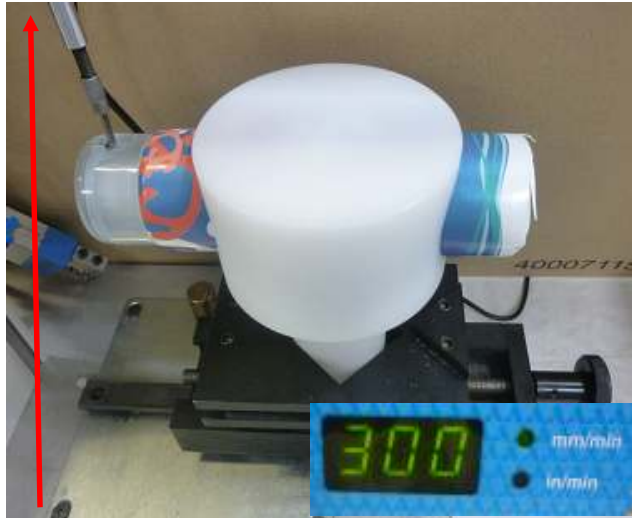
1. The cap-tube assembly is placed in the mandrel-support that is positioned horizontally on a vertical mandrel, which is immobilized by the mandrel carriage of the traction machine.
2. Subsequently, the position of the mandrel carrier carriage is regulated, as is the height of the load arm, so that the end of the loading arm is below the seal of the Safetop plug.
3. Once the elements are correctly positioned, the test is started and the load arm automatically moves vertically at a speed of 300mm / min.

The value of the breaking force of the first-use seal of the Safetop plug is displayed on the screen.

2



3



4



RESULTS

The test is considered to be compliant if the result is within the tolerances defined in the following table:

VALUES OF OPENING FORCE LIMIT (Newton)	
Reference	1 ^a dry opening
23.50/20L-00TE	10 +10/-8

NG 335: DROP TEST

OBJECT

The object of this document is to determine how to make the filled tube drop test from a plane's work, in order to assess their behavior in situations of end-user accidental fall of tubes.

MATERIAL

The material employed in this test includes:

- Test machine, designed by the CTL-TH Packaging group.
 - Horizontal plane, as a zone of positioning of tubes.
 - Pneumatic system, to push the samples for his fall to the ground
- Tubes for testing
- Water, as a playable reference content, in order to fill the tube with the volume of water, determined at the trial, representative capacity.
- In case of particular need, could be used products such as creams or cosmetic products in general, as an alternative to water.
- Optionally plastic bags to introduce in the tubes. So as to limit the possible projections.

OPERATING MODE

1. The tubes are filled with water in the nominal volume (+/-5%) or in equivalent weight (by applying water density of 1g/cc).
2. Then proceed to seal the tube.
3. We ensure that sealing is stabilized and the tube is tempered in the test area for at least 1 hour, the test shall be performed at ambient temperature (20 ± 2 ° C).
4. Place the tube in the worktable, at a height of 80cm. They will be pushed by a pneumatic system at a speed of 16 m/min causing their falls. The tubes will hit the floor (concrete or floor tile)
5. Drop five tubes for each position in the table as shown in the next photos:

POSITION 1



POSITION 2



POSITION 3



POSITION 4



6. Take the tubes dropped and check then as indicated:

Once the tubes fall test is carried out, analyze tube by tube in order to determine the possible deterioration of the packaging or tubes components, such as cracks or fissures, disassembly of sets, deformation...

Different methods are used to perform the analysis of the tubes tested:

- Visual evaluation of possible incidents.

When in doubt, carry out the following additional checks:

- Vacuum tightness test would be done to evaluate the possible loss of tightness. According to our NG x15 - SEAL TIGHTNESS TEST.
- To visualize possible hidden incidences, especially with snap-on caps, it is possible to dismount them from the tube.



**TECHNICAL SPECIFICATIONS
FOR EASYSUPPLYTUBE &
PLASTIC CAPS**

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NOTE: Drop each tube once. The results obtained on consecutive falls on the same tube are not valid.

RESULTS

The results are expressed as a function of the degradations observed after individual visual inspection of tested items.

A product is considered conforming if it has not suffered critical internal or external degradations as a result of the test (breaks, cracks, rendered non-operational, detachment of components, significant play...)

Note: External marks and scratches are acceptable