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Standard Safety Specification for Liquid Laundry Packets[1]

This standard is issued under the fixed designation F3159; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

ε[1] NOTE—Editorially corrected 5.3.3.2, 6.1, and 6.2 in December 2015.

INTRODUCTION

In November 2012 the U.S. Consumer Product Safety Commission (CPSC) issued a Safety Alert to inform parents and caregivers that Liquid Laundry Detergent Packets need to be kept away from children as those who are exposed to packet contents are at risk of serious injury and even death due to the highly concentrated nature of the product. Children who have accidently ingested Liquid Laundry Detergent Packets have experienced a range of injuries including loss of consciousness, respiratory distress, vomiting, coughing, choking and drowsiness, and in cases where there has been contact with the eyes, painful irritation of the eyes and corneal burns have occurred. In addition, death has been reported to occur following ingestion of Liquid Laundry Detergent Packets, including in one child.

1. Scope

1.1 This specification provides requirements for household Liquid Laundry Detergent Packet safety to help reduce unintentional exposures to the contents of the packets, especially to children.

1.2 This standard applies exclusively to household Liquid Laundry Detergent Packets. “Liquid Laundry Detergent Packets” are single-use laundry detergent products that contain a liquid detergent enclosed in a water soluble outer layer (“pouch film”). This includes laundry detergent packets in soluble film that contain liquid only (that is, all liquid), as well as those that contain both liquid and non-liquid components.

1.3 *This standard does not purport to address all of the safety concerns, if any, associated with ~~its~~ Liquid Laundry Detergent Packet use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use. It is the responsibility of the user of the product to follow the warning statements and use the product appropriately.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

D3475 Classification of Child-Resistant Packages

D4332 Practice for Conditioning Containers, Packages, or Packaging Components for Testing

D4359 Test Method for Determining Whether a Material Is a Liquid or a Solid

2.2 *ANSI Standard:*[3]

ANSI Z535.4 Safety Color Code—Environmental Facility Safety Signs—Criteria for Safety Symbols—Product Safety Sign and Labels and Accident Prevention Tags

3. Terminology

3.1 *Definitions:*

[1] This specification is under the jurisdiction of ASTM Committee F15 on Consumer Products and is the direct responsibility of Subcommittee F15.71 on Liquid Laundry Packets.

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[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard’s Document Summary page on the ASTM website.

[3] Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, http://www.ansi.org.

3.1.1 *liquid, n*—a substance or mixture which: *(1)* at 50°C has a vapour pressure of not more than 300 kPa (3 bar), *(2)* which is not completely gaseous at 20°C and at a standard pressure of 101.3 kPa, and *(3)* which has a melting point or initial melting point of 20°C or less at a standard pressure of 101.3 kPa.

3.1.1.1 *Discussion*—

A viscous substance or mixture for which a specific melting point cannot be determined shall be subjected to the Test Method D4359-90 test; or to the test for determining fluidity (penetrometer test) prescribed in section 2.3.4 of Annex A of the European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR).

3.1.2 *liquid laundry detergent packets, n*—individual packets that contain liquid laundry detergent and are intended to dissolve when used as intended.

3.1.3 *pouch film, n*—the water-soluble outer layer of a Liquid Laundry Detergent Packet that contains laundry detergent or other liquid ingredients, or both, and is designed to dissolve when used as intended.

4. Liquid Laundry Detergent Packet Requirements

4.1 The Liquid Laundry Detergent Packet must meet the requirements set forth in European Commission Regulation (EU) No 1272/2008, Annex II, Part 3, Section 3.3.3, and Sections 4 (Aversive Agent in the Soluble Film) and 5 (Capsule Integrity) of the accompanying AISE Liquid Laundry Detergent Capsules Guidelines on CLP Implementation[4], including as may be amended. For reference, EU No 1272/2008, Annex II, Part 3, Section 3.3.3, is attached as Annex A5, and Sections 4 and 5 of the AISE Liquid Laundry Detergent Capsules Guidelines on CLP Implementation are attached as Annex A7.

4.2 For the avoidance of doubt, European Commission Regulation (EU) No 1272/2008, Annex II, Part 3, Section 3.3.3 (i) does not specify any particular manner in which the soluble packaging containing the agent must have the aversive agent added to the soluble packaging. A company may choose, by way of non-limiting examples, to introduce the aversive agent to the soluble packaging by admixing it into a slurry that is subsequently formed or cast into a film and/or by coating it onto a previously formed film. It is up to each company to select the aversive agent and technology they deem appropriate for their products and effective for meeting the criteria of being safe and eliciting oral repulsive behavior within a maximum time of 6 s as provided by and in accordance with the EU Regulation.

5. Packaging Requirements

5.1 Liquid Laundry Detergent Packets shall be contained in opaque packaging or packaging that employs any equivalent measure intended to mask the visibility of the individual Liquid Laundry Detergent Packets (“Package” or “Packaging”). The package must not be labeled with graphics that make the opaque package appear transparent or translucent.

5.2 Packaging described in this Voluntary standard is packaging that is designed or constructed to be difficult for children to access Liquid Laundry Detergent Packets. To comply with this standard, the package shall have the characteristics of at least one of the following six options outlined below in 5.3.1. In addition to meeting with at least one of the six options, a package must also:

5.2.1 Comply with this standard through the full life cycle of product package.

5.2.2 The package must meet the option standard for which the package is designed while also accounting for any other way the package could conceivably be opened for example by twisting, pulling, or use of singular force.

5.3 *Options for Packaging:*

5.3.1 A package that meets the performance requirements of 16 CFR Part 1700, section 1700.15 and testing requirements of 16 CFR Part 1700, section 1700.20.

5.3.2 An individually-wrapped package that contains no more than one packet and incorporates either:

5.3.2.1 A hidden tab or notch or other means of opening that is only exposed after the package has been folded or manipulated in an instructed manner, or

5.3.2.2 A feature described in Classification D3475-14, Type IV Non-reclosable packaging-flexible and Type V Unit non-reclosable packaging-rigid.

5.3.3 A package that requires manipulative skill or dexterity to open, including, but not limited to:

5.3.3.1 A package with two or more closure mechanisms that are interdependent, so that the package cannot be fully opened without releasing at least two of the closure mechanisms.

5.3.3.2 A double-action release mechanism, defined as either:

(1) A mechanism requiring two consecutive motions, the first of which must be maintained (and which may include the act of physically holding or stabilizing the package) while the second is carried out in order to fully open the package, or

[4] A.I.S.E., Liquid Laundry Detergent Capsules Guidelines On CLP Implementation, Version 1.0, 27 February 2015.

(2) Two separate and independent motions that must be activated or occur simultaneously to fully open the package. ~~A simple zipper closure (pull to open or simple slider) would not meet this requirement.~~

NOTE 1—A simple zipper closure (pull to open or simple slider) would not meet the requirements of either 5.3.3.2*(1)* or *(2)*.

5.3.3.3 A release mechanism or system of mechanisms which requires two independent release mechanisms to be performed consecutively in order to fully open the package.

5.3.3.4 The package must be designed so that the user is able to close the package and re-engage the release mechanism(s) in a manner that requires only one re-engagement action on the part of the user.

5.3.4 A package closure that meets the requirements set forth in European Commission Regulation (EU) No 1272/2008, Annex II, Part 3, Section 3.3.2 (iv), and Section 3.3 (Outer Packaging: Closures) of the accompanying AISE Liquid Laundry Detergent Capsules Guidelines on CLP Implementation, as may be amended. For reference, EU No 1272/2008, Annex II, Part 3, Section 3.3.2 (iv), is attached as Annex A4, and Section 3.3 of the AISE Liquid Laundry Detergent Capsules Guidelines on CLP Implementation is attached as Annex A6.

5.3.5 A package that requires the intellectual skill or cognitive ability of a child at least 6 years of age to open, that meets all of the criteria set forth in 5.3.5.1 – 5.3.5.3, or a reasonable equivalent of 5.3.5.1 – 5.3.5.3, and meets the requirements of 5.3.5.4:

5.3.5.1 Identification of a non-obvious opening method that requires cognitive understanding of a manipulative concept.

5.3.5.2 The mechanical means that secures the package is obscured from view and not readily apparent when handling the package.

5.3.5.3 Requires manipulation of a visual or tactile feature in a way that is non-obvious unless the user understands the manipulative concept.

5.3.5.4 The package must be designed so that the user is able to close the package and re-engage the release mechanism(s) in a manner that requires only one re-engagement action on the part of the user.

5.3.6 A package that, in order to be opened, requires either:

(1) An opening force greater than that which a child is capable of generating while not being greater than a senior adult is capable of generating, or

(2) Hand anthropometric characteristics greater than those of an average-sized child.

5.3.6.1 The ages and distribution of children to be tested for purposes of establishing the opening force strength or hand anthropometric characteristics must meet the requirements set forth in 16 CFR 1700.20(a)(2)(i).

5.3.6.2 The opening force strength or hand anthropometric characteristics shall be set at the 95th percentile for children, and the 5th percentile for senior adults.

5.3.6.3 Research must demonstrate that the opening force strength or hand anthropometric characteristics do not exceed those of senior adults between the ages of 50 and 70 years to access the package, as tested pursuant to the requirements set forth in 16 CFR 1700.20(a)(3).

5.3.6.4 Research that establishes opening strength or hand anthropometric characteristics as set forth above must be conducted by an independent third party, and the results published in a peer-reviewed journal.

5.3.6.5 A manufacturer must demonstrate through testing that the opening force required or hand anthropometric characteristics for its packaging design are within the limits of the data.

6. Labels

6.1 Each package shall be labeled with warning statements. The ~~Safety Alert Symbol and~~ warning statements shall be:

6.1.1 In contrasting color(s), permanent, conspicuous, and in sans serif style font;

6.1.2 Distinctively separated from any other wording or graphics, in a "quiet zone" (that is, placed on a single-color, contrasting background); and

6.1.3 Located on the product in a prominent location so they are visible to the consumer.

6.2 The ~~Safety Alert Symbol and~~ following statements shall appear on the front panel/principal display panel of the package:

WARNING:

Harmful if put in mouth or swallowed. Eye irritant.

Packets can burst if children put them in mouth or play with them.

See warning on [back/side] label.

Keep out of reach of children.

6.2.1 See Annex A1 for an example of an FHSA-compliant layout.

6.3 The Safety Alert Symbol and text of the precautionary statements shall be laid out on the back or side panel of the secondary container as set forth in ANSI Z535-4 (2011) Figures 3 through 12 and Figures B26 through B28 or in a substantially similar format, except that neither the borders nor boxes depicted in those figures are required. The precautionary statements shall include the following:

6.3.1 The Safety Alert Symbol, as found in ANSI Z535-4, Fig. 1 (D) or ~~(E):~~(E).

6.3.2 Annex A2 includes additional safety symbols to be used with the warning statements. Each package must feature at least one pair (that is, one "keep out of reach of children" symbol and one "keep contents out of eyes" symbol).

D E

FIG. 1 Safety Alert Symbol

6.4 The following statements shall appear on the back or side panel of the secondary container:

WARNING:

Concentrated detergent packets can burst if children put them in mouth or play with them. The liquid inside is harmful if put in mouth, swallowed, or in eyes.

Keep ~~packet~~packets out of reach of children.

- Store container where children cannot reach or climb to it, out of sight and in a secure place.
- Keep container fully closed.
- Never leave any packets out of container.
- DO NOT let children handle packets, even if supervised.

Avoid breaking packets.

- Do not handle packets with wet or moist hands. Do not expose packets to moisture.
- Do not cut or puncture packets. If packets stick together, do not try to separate them.

Call poison control center immediately if detergent gets in mouth or eye or on skin. Immediately and thoroughly rinse eye or skin with water for 15 min.

6.5 All individually-wrapped sample packages shall contain no more than one packet. Each individually-wrapped sample package shall include the following statements:

WARNING:

Concentrated detergent packets can burst if children put them in mouth or play with them. The liquid inside is harmful if put in mouth, swallowed, or in eyes.

Keep packet out of reach of children.

- Store where children cannot reach or climb to it, out of sight and in a secure place.
- DO NOT let children handle packet, even if supervised.
- Use packet immediately after opening.

Avoid breaking packet.

- Do not handle packet with wet or moist hands. Do not expose packet to moisture.
- Do not cut or puncture packet.

Call poison control center immediately if detergent gets in mouth or eye or on skin. Immediately and thoroughly rinse eye or skin with water for at least 15 min.

6.6 Each individually-wrapped packet that is contained in a larger outer package that contains multiple individually-wrapped packets shall include at least one pair (that is, one “keep out of reach of children” symbol and one “keep contents out of eyes” symbol) of the additional safety symbols from Annex A2.

6.7 The language listed above and icons shown in Annex A2 may be modified as necessary to ensure compliance with local regulatory requirements, or for translation purposes. Additional warnings or cautionary statements or, if appropriate, alternate first aid instructions may also be included on the label, depending on the formula, packaging used and other considerations. Furthermore, and for the avoidance of doubt, other words, such as “pac” or “pack” or a trademarked name for the product, may be substituted for “packets” in these statements in order to allow for consistent terminology on each product’s package.

7. Keywords

7.1 child deterrent; container; detergent; ingestion; laundry packet

ANNEXES

(Mandatory Information)

A1. FHSA-COMPLIANT PRINCIPAL DISPLAY PANEL (FRONT PANEL)

WARNING: HARMFUL IF PUT IN MOUTH OR SWALLOWED. EYE IRRITANT. Packets can burst if children put them in mouth or play with them. See warning on [back/side] label.

Keep out of reach of children.

A2. ICON AND ALERT SYMBOL EXAMPLES

A2.1 See Fig. A2.1.

NOTE 1—If words are not included within the prohibition surround shape, use standard prohibition circle (rather than the version that is widened to accommodate words, as seen in the first example).

FIG. A2.1 Icon and Alert Symbol Examples

A3. OTHER INFORMATION SOURCES RELATING TO THE SAFETY OF LIQUID LAUNDRY DETERGENT PACKETS

ACCC, http://www.productsafety.gov.au/content/index. phtml/itemId/999447 & http://www.productsafety.gov.au/ content/ index.phtml/itemId/998653/fromItemId/999447

Accord, http://www.accord.asn.au/public_information_submission/children_and_safe_storage

ACI (USA), http://www.cleaninginstitute.org/clean_living/singleload_liquid_laundry_packets.aspx

AISE (Europe), http://www.aise.eu/go.php?pid=44122 &topics=1

CPSC (USA), http://www.cpsc.gov//PageFiles/132488/ 390%20Laundry%20Packets.pdf

A4. EUROPEAN COMMISSION REGULATION (EU) NO 1272/2008, ANNEX II, PART 3, SECTION 3.3.2(iv)

A4.1 Without prejudice to the requirements of section 3.1, be fitted with a closure that: (a) impedes the ability of young children to open the packaging by requiring coordinated action of both hands with a strength that makes it difficult for young children to open it; (b) maintains its functionality under conditions of repeated opening and closing for the entire life span of the outer packaging.

A5. EUROPEAN COMMISSION REGULATION (EU) NO 1272/2008, ANNEX II, PART 3, SECTION 3.3.3

A5.1 The soluble packaging shall:

A5.1.1 Contain an aversive agent in a concentration which is safe, and which elicits oral repulsive behaviour within a maximum time of 6 s, in case of accidental oral exposure;

A5.1.2 Retain its liquid content for at least 30 s when the soluble packaging is placed in water at 20°C;

A5.1.3 Resist mechanical compressive strength of at least 300 N under standard test conditions.

A6. A.I.S.E. LIQUID LAUNDRY DETERGENT CAPSULES GUIDELINES ON CLP IMPLEMENTATION (SECTION 3.3)

A6.1 Closures

A6.1.1 The closure of the LLDC outer packaging must meet two main requirements that need to be balanced:

A6.1.1.1 impede young children from opening the packaging and

A6.1.1.2 for adults, allow easy regular opening and reclosing after use.

A6.1.2 These functionalities must be maintained during the packaging life span.

A6.1.3 In addition, the pack (that is, the ‘outer packaging’ in the Soluble Packaging Regulation) should be self-standing and should remain so throughout the life span of the pack.

A6.1.4 With regard to closure design, the Soluble Packaging Regulation refers qualitatively to two elements: 'requiring coordinated action of both hands' and 'a strength' for opening.

A6.1.5 These requirements apply 'without prejudice to the requirements of section 3.1 [of Annex II to CLP]' which prescribe child-resistant fastenings for specific mixture classifications (such as skin corrosive products). A.I.S.E.'s understanding is that the closure requirements for Soluble Packaging are different from child-resistant fastenings in section 3.1 and apply independently, without conflict. So section 3.1 of Annex II continues to apply for certain mixture classifications and, in addition, the new section 3.3 applies to LLDCs regardless of their classification.

A6.1.6 No performance standards exist today for 'child-impeding closures' that are not fully 'child-resistant' (in the meaning of the ISO 8371 standard). Our industry is committed to work on the development of a performance standard to assess the 'child-impeding' function of packaging, taking into account that 'coordinated action of both hands' is required.

A6.1.7 It should be noted that it would require at least two years to shelf new packaging designs in all markets.

A6.1.8 In the meantime, A.I.S.E. suggests the following:

A6.1.8.1 'coordinated action of both hands' for opening: in the lack of clear design description in the legal text, it is up to each company to assess the design against compliance with this general requirement. It builds on the fact that the key differentiator between adults and children is mental capacity, logic and dexterity. Coordination may include the required use of hands to secure a pack to enable the opening of a closure system (for example, stand-up pouches).

A6.1.8.2 'with a strength' for opening: is to be seen in the context of the target age group, namely children below the age of 6 years. No strength value is specified in the legal text but it should be sufficient so that the closure cannot be opened unintentionally (for example, by simply touching the outer packaging). Again, it should be borne in mind that the key differentiator between adults and children is dexterity and logic rather than strength.

A6.1.8.3 'easily reclosable': the outer packaging closure must be able to be closed by adults in a single action, such as but not limited to, one clip to be pushed, a gentle pressure on the lid to lock, one zipper to be activated.

A6.1.8.4 'maintains its functionality under conditions of repeated opening and closing for the entire life span': the closure system must meet the above criteria on opening and reclosing for the designed life of the packaging, which corresponds to at least the number of capsules/unit doses in the outer packaging.

A7. A.I.S.E. LIQUID LAUNDRY DETERGENT CAPSULES GUIDELINES ON CLP IMPLEMENTATION (SECTIONS 4 AND 5)

A7.1 Aversive Agent in the Soluble Film

A7.1.1 According to the Soluble Packaging Regulation, the soluble packaging (that is, the capsule wall) must **contain an aversive agent** in a concentration which is safe, and which elicits oral repulsive behavior within a **maximum time of 6 s**, in case of accidental oral exposure.

A7.1.2 This measure is intended to further reduce the chance of ingestion of the liquid content in case a child left unattended has managed to gain access to a capsule and places it in his/her mouth.

A7.1.3 A.I.S.E. has developed and evaluated a **protocol to determine effective levels of aversive agent** contained in soluble packaging, that is, in the soluble film. The resulting study protocol is provided in Annex A8.

A7.1.4 The objectives of this work were:

A7.1.4.1 to develop a *method for measuring the oral rejection time*, as a function of the level of aversive agent in the film;

A7.1.4.2 to prove the concept of effectiveness testing (at different concentrations of aversive agent), in other words to establish a 'benchmark test'.

A7.1.5 One grade of film and one particular aversive agent were selected for the study.

A7.1.6 The A.I.S.E. study has shown that, for the particular aversive agent and film selected, it was possible to determine a level of aversive agent sufficient to elicit a median oral rejection in less than 6 s. Above this concentration, the 'dose-response' curve was flat, that is, higher levels of aversive agent were not found to lead to lower rejection times. A summary of the study findings is provided in Annex A9.

A7.1.7 For ethical reasons, the study was run on young adults instead of children. This is a conservative approach, because a child's palate is much more sensitive than that of adults. Infants have around 30 000 taste buds spread throughout their mouths. By the time adulthood is reached, only about a third of these remain, mostly on the tongue. The decreasing sensitivity to bitterness with age was demonstrated by Mennella et al. (2005)[5]. Consequently, it is reasonable to assume that the observed oral rejection times with young adults are similar to or higher than what may be expected with young children.

A7.1.8 It is important to note that it is up to each company to demonstrate effectiveness of the aversive agent chosen to their own situation (soluble film/agents) at *design* stage. This is because:

A7.1.8.1 different aversive agents may lead to different human responses and

A7.1.8.2 the effective concentration of aversive agent may be affected by the polymer chemical composition, presence of other chemicals in the film, etc.

A7.1.9 It is also up to each company to select the aversive agent they deem appropriate for their products, taking into account that some limitations of use related to Intellectual Property may apply to certain aversive agents, films or technologies.

A7.1.10 It is advised to foresee a safety margin so that the effectiveness of the aversive agent is maintained during the whole life cycle of the product.

A7.1.11 Companies will need to document the levels of aversive agent used and the rationale, and **keep such records for 10 years** (in line with the general REACH and CLP record keeping deadlines).

A7.1.12 Further, the Soluble Packaging Regulation requires the **effective concentration of aversive agent to be safe**. A.I.S.E. recommends to determine that the concentration chosen is safe in case of ingestion of the amount of film contained in one capsule, by means of a human health toxicological risk assessment, based on the highest level of aversive agent contained in the soluble packaging at any time of the product life cycle and adapted to the target age group (young children, including babies). The safety date sheet of the aversive agent is a useful source of toxicological data but may not be sufficient to run a full risk assessment.

A7.1.13 Environmental safety should also be documented. It should be reminded that the REACH Registration is the main mechanism to assess environmental safety of substances and demonstrate the use is safe (unless a particular substance does not need to be registered by law). Annex A10 provides an example of a screening environmental risk assessment for one particular aversive agent (denatonium benzoate) showing that, even under conservative assumptions, the addition of this bittering agent in unit dose soluble films is of no concern from an environmental perspective.

A7.2 Capsule Integrity

A7.2.1 Two specific requirements apply under the Soluble Packaging Regulation in relation to capsule integrity: mechanical resistance and liquid containment.

[5] Julie A. Mennella, M. Yanina Pepino, and Danielle R. Reed. Genetic and environmental determinants of bitter perception and sweet preferences. *Pediatrics*, 2005, 115 (2), e216–e222.

A7.2.2 Both the mechanical and the containment function tests are understood as **'design tests'**. They serve a safety purpose in the qualification of products/validation of processes. They are not considered as quality control tests since it is impossible in practice to test every single capsule.

A7.2.3 These tests should be performed on an appropriate, representative number of capsules at design stage and should be repeated, at the minimum, at every substantial design change in product, film specification, formulation or manufacturing process.

A7.2.4 The capsules will be tested at least 24 h after production after having been conditioned in an environment with a standard temperature and relative humditiy. More details are provided in the test protocols (Annex A11 and Annex A12).

A7.2.5 *Liquid Containment Function:*

A7.2.5.1 The Soluble Packaging Regulation requires the soluble packaging to retain its liquid content for at least 30 s when the capsule is in contact with water. Some of the testing parameters are set by the Regulation (water, temperature).

A7.2.5.2 To A.I.S.E.'s knowledge, no standard method exists for such type of test.

A7.2.5.3 Building on the experience from its members, A.I.S.E. has developed a **containment function test protocol**, which is provided in Annex A11 to this document.

A7.2.6 *Mechanical Integrity:*

A7.2.6.1 The Soluble Packaging Regulation requires the soluble packaging to resist a mechanical compression strength of 300 N under standard test conditions.

A7.2.6.2 A.I.S.E. recommends running a **dynamometric test**: the purpose of such compression test is to assess the mechanical integrity of a capsule submitted to a compressive strength.

A7.2.6.3 Building on the experience from its members, A.I.S.E. has developed a test protocol, which is provided in Annex A12 to this document.

A8. STUDY PROTOCOL: ASSESSMENT OF THE EFFECTIVENESS OF AN AVERSIVE AGENT IN SOLUBLE FILM FOR LIQUID LAUNDRY DETERGENT CAPSULES

A8.1 Objective

A8.1.1 The objective of this test is to determine the effectiveness of a given aversive agent contained in a given soluble packaging film. The dose-response relationship of the level of aversive agent with the observed oral rejection time is investigated. From this, the level of aversive agent that is expected to lead to a rejection time below 6 s is determined.

A8.2 General Study Description

A8.2.1 The response of test panelists to tasting water-soluble film with different levels of aversive agent is to be observed. From this, a dose-response relationship is to be established that links the deterring effect (rejection of the film) with the level of the aversive agent.

A8.2.2 The test panel shall consist of young adults, as a proxy for the target audience for the safety measures on liquid laundry detergent capsules (that is, young children). There are reliable indications that, especially for bitter taste, children are usually more sensitive than adults.