GENERAL STATEMENT

The Saint Lucia Bureau of Standards was established under the Standards Act (No.14 of 1990) and started operations on 01 April 1991. A broad-based 15-member Standards Council directs the affairs of the Bureau.

The Standards Act gives the Bureau the responsibility to develop and promote standards and Codes of Practice for products and services for the protection of the health and safety of consumers and the environment as well as for industrial development in order to promote the enhancement of the economy of St. Lucia. The Bureau develops standards through consultations with relevant interest groups. In accordance with the provisions of the Standards Act, public comment is invited on all draft standards before they are declared as St. Lucia National Standards.

The Bureau also administers the Metrology Act No. 17 of 2000. This legislation gives the Bureau the responsibility to regulate all weights and measures and to manage and co-ordinate the metrication of St. Lucia.

The Bureau operates a Product Certification Scheme applicable to all products for which national standards exist. If a product satisfies all the requirements for certification a licence to carry the St. Lucia Standard Mark is issued to the manufacturer of the product. The presence of the mark on a product indicates that the product conforms to all the requirements of a specific national standard and assures consistent quality (of the product) to the consumer.

The Bureau is a member body of the International Organization for Standardization (ISO), an affiliate member of the International Electrochemical Commission (IEC) and a member of the CARICOM Regional Organization for Standards and Quality (CROSQ) and the Pan American Standards Commission (COPANT). The Bureau is the local agent for several foreign standards bodies such as the British Standards Institution (BSI) and the American Standards for Testing and Measurement (ASTM). The Bureau also serves as the enquiry point for the World Trade Organization (WTO) on matters pertaining to the Technical Barriers to Trade (TBT) Agreement.

In accordance with good practice for the adoption and application of standards, St. Lucia National Standards are subject to review every five years. Suggestions for improvements are always welcomed.
SPECIFICATION FOR SYNTHETIC LAUNDRY DETERGENT POWDER

AMENDMENTS ISSUED SINCE LAST PUBLICATION

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SAINT LUCIA NATIONAL STANDARD

DNS 26

SPECIFICATION FOR SYNTHETIC LAUNDRY DETERGENT POWDER

TECHNICAL COMMITTEE FOR CHEMICALS & CHEMICAL PRODUCTS

The following persons comprised the Technical Committee which was responsible for the formulation of the standard:

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Lennox Wilson

Representing

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**Members**

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Private Interest

Yannis Charles

Ministry of Justice

Tzarmallah Haynes (Technical Secretary)

Saint Lucia Bureau of Standards
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Foreword

This national standard is a revision of the SLNS 26: 1996 Specification for Synthetic Laundry detergent. The revision of this standard seeks to align the requirements for synthetic laundry detergent powder with advancements in technology.

The revised version of this standard was approved by the standards council on…….

Synthetic laundry detergents are manufactured in St. Lucia and are also imported from various countries. Many developments continue to take place in the detergent industry and for a product that is widely used in all sectors of society, it is imperative that the best possible product is presented to the consumer.

The contents of this standard reflect recent changes that have been taking place in the industry, including provisions for consumer and environmental protection.

In preparation of this standard considerable assistance was derived from:


Annexes A, B, C, D and E are normative annexes. Annex F is an informative annex.

1 Scope

This National Standard provides the specifications for synthetic laundry detergent powder herein referred to as detergent. It specifies the chemical and physical requirements identifying maximum and minimum permissible limits of key parameters. It also covers essential ingredients, test methods and requirements for packaging, labelling and sampling.

This National Standard is applicable to synthetic laundry detergent powder intended primarily for washing household textile products using conventional household laundry equipment, or by manual means.

This standard is not applicable to liquid laundry detergent and does not include methods for measuring the performance of laundry detergents.

2 Normative reference

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.
3 Terms and definitions

For the purposes of this National Standard the following terms and definitions shall apply:

3.1 active ingredients
means the organic surface-active material present in the detergent

NOTE Permissible types of active ingredient include anionic, cationic and non-ionic.

3.2 anti-redeposition agent
means a substance that inhibits the redeposition of suspended soil, in a washing bath, previously removed from the fabric

3.3 batch
means detergent of a single type, grade, class and composition manufactured under the same conditions and during the same production run
3.4 biodegradable
means capable of being decomposed by living matter especially by bacteria

3.5 builder
means a material added to the detergent formulation that enhances or maintains the cleaning efficiency of the surfactant, principally by inactivating water hardness either by sequestration, precipitation or ion exchange

NOTE Secondary benefits may include supplying alkalinity, buffering to maintain alkalinity at optimum effective cleaning levels, adding anti-redeposition properties and emulsifying oily soil.

3.6 defect
means a non-conformance with a requirement of the standard

3.7 defective
means unacceptable or unsuitable for distribution or sale as determined by conformity with this National Standard

3.8 detergent
means a composition that removes soil

3.9 foreign matter
means matter not intended to be part of the detergent composition by the manufacturer

3.10 laundry detergent powder for household use
means a substance primarily intended for the wet-cleaning of household textile products which contains as an essential component a surfactant for laundering fabrics

3.11 lot
means all the packages in a consignment containing material of the same grade and drawn from the same production batch and which are identically labelled

3.12 manufacturer
means the person or organization actually engaged in or being principally responsible for manufacturing or producing the laundry detergent

3.13 mixed active ingredient detergent
means a detergent containing either cationic and/or anionic active ingredient in addition to anionic active ingredient

3.14 moisture and volatile matter
means water and other materials in a detergent that are volatile under the conditions of the test

3.15 outer case
means a parcel consisting of packages of detergents, grouped together for ease of handling, transport, distribution or sale

3.16 package
means the unit in which the detergent is stored, which is labelled, and distributed for individual sale

EXAMPLE It may be a carton, box or bag.

3.17 sequestering builder
means a material that suppresses the hardness of water and improves the effectiveness of surface active agents

3.18 soil
means matter out of place, on the fabric, that is to be removed by the detergent

3.19 surfactant
means a material which when added to a liquid medium, modifies the properties of the medium at a surface or interface.

NOTE Admitted terms include: ‘surface active agent’.

4 Requirements

4.1 General requirements

4.1.1 Physical appearance

4.1.1.1 The detergent shall be homogenous in appearance (i.e. uniform in colour and texture) and shall consist of non-segregating, free-flowing powder.

4.1.1.2 In the instance that caking or lumping occurs during normal storage, agglomerations shall be capable of easy dispersal with little manual effort.

4.1.1.3 The detergent shall be visibly free from foreign matter.

4.1.2 Dispersibility

The detergent shall be readily dispersible in water.

4.1.3 Effect with use

When used in accordance with the manufacturer’s directions, the detergent shall have cleaning and lathering properties.

4.1.4 Effect on health

When used in accordance with manufacturer’s directions the detergent shall not be injurious to health.

NOTE When hand-washing, suitable protective measures should be taken against the detergent’s typically drying nature. Further, persons bearing special topical sensitivity to detergents should also take the necessary precautions.
4.1.5 Contents

The net weight of the contents of the package shall not be less than that stated on the label. For a lot of detergents, compliance with this requirement shall be determined in accordance with Annex E.

4.2 Specific requirements

4.2.1 Storage properties

The detergent shall meet the requirements stated in clauses 4.1.1 to 4.1.5, for a period of at least twelve (12) months from the date of manufacture, when stored according to the manufacturer’s instructions.

4.2.2 Ingredients

4.2.2.1 The detergent shall contain the following as essential components

a) surfactant(s) suitable for fabric detergency;

b) builder(s) as (a) water softening agent(s); and

c) anti-redeposition agent(s).

4.2.2.2 The detergent shall meet the requirements for biodegradability as specified in Table 1.

NOTE The detergent may also contain special purpose additives to enhance performance, convenience, or product appeal. A list of commonly used ingredients is presented in Annex F.

4.2.2.3 The detergent shall not contain any ingredient which poses a threat to human health or the environment or is deemed unsuitable for use by the appropriate authority.

NOTE For ingredients not known as suitable surfactants, builders or additives for laundry detergents, the manufacturer or vendor should provide evidence that such substances have been found to be harmless to human health and the environment and suitable for use as such.

4.2.3 Chemical and physical requirements

The detergent’s properties shall comply with the requirements presented in Table 1 when analysed according to test methods specified for each property.
### Table 1 — Chemical and physical requirements

<table>
<thead>
<tr>
<th>Property</th>
<th>Limit</th>
<th>Test Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moisture and volatile matter content at 105 °C max. (% by mass)</td>
<td>Minimum</td>
<td>Maximum</td>
</tr>
<tr>
<td>pH of 1% aqueous solution at 27°C</td>
<td>9.0</td>
<td>11.0</td>
</tr>
<tr>
<td>Water insoluble matter (% by mass)</td>
<td>Minimum</td>
<td>5.0</td>
</tr>
<tr>
<td>Free alkali as NaOH (% by mass)</td>
<td>Minimum</td>
<td>0.1</td>
</tr>
<tr>
<td>Anionic active ingredient % by mass(^a)</td>
<td>12</td>
<td>-</td>
</tr>
<tr>
<td>Total mixed active ingredient detergent(^b)</td>
<td>12</td>
<td>-</td>
</tr>
<tr>
<td>- anionic active ingredient(% wt)</td>
<td>8</td>
<td>-</td>
</tr>
<tr>
<td>- other active ingredient(^c) (%wt)</td>
<td>1.5</td>
<td>-</td>
</tr>
<tr>
<td>Phosphates as P(_2)O(_5) (% wt.)</td>
<td>Minimum</td>
<td>20</td>
</tr>
<tr>
<td>Sodium silicates (as SiO(_2)) (% wt.)</td>
<td>5</td>
<td>12</td>
</tr>
<tr>
<td>Sodium carboxymethylcellulose (% wt.)(^f)</td>
<td>0.2</td>
<td>-</td>
</tr>
<tr>
<td>Biodegradability of alkylbenzene sulphonate (where applicable) (% surfactant reduction)</td>
<td>80</td>
<td>-</td>
</tr>
<tr>
<td>Particle size</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Material passing through a US standard #10 (2000 µm) sieve (% by wt.)</td>
<td>100</td>
<td>-</td>
</tr>
<tr>
<td>Material passing through a US standard #200 (75µm) sieve (% by wt.)</td>
<td>-</td>
<td>3</td>
</tr>
</tbody>
</table>

\(^a\) This applies if only anionic surfactants are used.  
\(^b\) The minimum amounts of anionic and other active ingredients are specified, and add up to 9.5 %. The total minimum amount of mixed active ingredient shall be 12 %, the remaining 2.5 % being either anionic or other active ingredient.  
\(^c\) Other active ingredients are cationic and/or non-ionic active ingredient.  
\(^d\) The total cationic active ingredient (wt %) is equal to the sum total of the cationic active ingredient value (wt %) obtained from both ISO 2871-1: 1989 and ISO 2871-2: 1989.  
\(^e\) BS 3762-3.7:1986 is used to determine the wt % for non-ionic active ingredient only.  
\(^f\) This applies if sodium carboxymethylcellulose is the only anti-redeposition agent used.
5 Test methods

Tests for compliance with the specified limits for properties listed in Table 1 shall be carried out in accordance with the method specified for each property in Table 1. Compliance with the requirement specified in clause 4.1.5 shall be determined by the test method described in Annex E.

6 Sampling

6.1 Sample size

Each lot shall be tested separately for compliance with the requirements of this standard. The number (n) of packages to be selected to constitute a representative sample of the lot shall depend on the size of the lot (N). The sample size for each lot shall be in accordance with Table 2.

<table>
<thead>
<tr>
<th>Lot or batch size, N (# of packages)</th>
<th>Sample size, n (# of packages)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 - 25</td>
<td>2</td>
</tr>
<tr>
<td>26 - 150</td>
<td>3</td>
</tr>
<tr>
<td>151 - 1200</td>
<td>5</td>
</tr>
<tr>
<td>1201 - 35000</td>
<td>8</td>
</tr>
<tr>
<td>35001 and over</td>
<td>13</td>
</tr>
</tbody>
</table>

6.2 Selection of packages

Packages shall be selected systematically as described in 6.2.1 or randomly using random number tables.

6.2.1 Starting from any package, count and number all the packages in numerical order as 1, 2, 3, 4 …… up to r (defined below) , and withdraw every r package thus counted to give a sample for the test.

Where \( r = \text{integral part of } N/n \)

\[ N = \text{the lot size} \]

\[ n = \text{the number of packages to be selected (sample size)} \]

6.2.2 Where packages are grouped into outer cases, as far as it is possible, only one package from each outer case shall be selected until the entire sample has been collected. Every effort shall be made to collect sample packages representative of all packing positions in the outer cases. The selection of outer cases for the sampling exercise shall be carried out in accordance with 5.3.

6.3 Selection of outer cases
6.3.1 Where the number of outer cases exceeds the sample size (n), outer cases will be selected randomly for inclusion in the sampling exercise. For inclusion in the sampling exercise.

6.3.2 Where the sample size (n) exceeds the number of outer cases, every effort shall be made to apportion sampling quotas equally among the outer cases of the lot.

7 Conformity to requirements

7.1 Lot conformity

The entire lot shall be deemed as conforming to the requirements of this standard when the outer cases sampled in accordance with 6.2 conform to the chemical and physical requirements specified in Table 1.

7.2 Conformity assessment

7.2.1 For each property to be tested on the individual samples of the lot, the mean ($\bar{x}$) value and the range ($R$) value shall be calculated as follows:

\[ \text{Mean (} \bar{x} \text{)} = \frac{\text{Sum of test results}}{\text{Number of primary packages sampled}} \]

Range ($R$) = The difference between the maximum and minimum values of the test results

7.2.2 The samples shall be deemed as conforming to a particular chemical or physical requirement under the following conditions:

(a) if the value of the expression ($\bar{x} - 0.4R$) is greater than or equal to minimum value specified for the property in Table 1, for which only the minimum value is given;

(b) if the value of the expression ($\bar{x} + 0.4R$) is less than or equal to the maximum value given specified for the property in Table 1, for which only the maximum value is given; or

(c) if the value of the expression ($\bar{x} \pm 0.4R$) falls within the range of values specified for the property in Table 1, for which both the maximum and minimum values are given.

8 Packaging and labelling

8.1 The detergent shall be packed in securely closed packages which protect them from deterioration and which prevent leakage.

8.2 Outer cases shall contain packages of detergent produced from the same batch.

8.3 Labelling shall comply with the requirements of SLNS 18: Part 1 Labelling of Commodities – General Labelling requirements.
8.4 Outer cases and packages for individual sale shall also be conspicuously and legibly labelled and/or marked to convey the following information:

(a) the name of the product which includes the words “laundry”, “detergent”, “powder” or “powdered”;
(b) the brand name of the product and/or recognized trade mark where applicable;
(c) the name and address of the manufacturer and/or distributor including the country of origin;
(d) the net weight of the contents of the packaged product;
(e) instructions for applicable usage;
(f) precautions for use or potential hazards presented by product use;
(g) the month and year of manufacture;
(h) a "best before" date;
(i) the batch number or lot number stated in code or otherwise; or
(j) a caution statement as to the irritant capability of the detergent.

EXAMPLE Detergent solution can be a skin irritant. Avoid prolonged contact. Rinse garment and hands thoroughly.

NOTE Where the product has been certified by the Saint Lucia Bureau of Standards it may also bear the SLBS Standards Mark.
Annex A
(normative)

Determination of moisture and volatile matter content

A.1 Apparatus

Desiccator
Oven capable of maintaining 105°C
Petri dish

A.2 Procedure

Weigh 10g ± 0.1g of detergent into a previously weighed petri dish.
Leave in the oven at 105°C ± 0.5°C for two hours.
Cool in a dessicator and weigh.
Continue heating, cooling and weighing until a constant weight is obtained.

A.3 Calculation

% moisture and volatile matter in sample = 100x m/M

Where m = mass of petri dish and original sample – mass of petri dish and cooled sample; and

M = mass of original sample
Annex B
(informative)

Determination of pH value

B.1 Apparatus

pH Meter: A standard pH meter which meets the requirements of BS 3145

Volumetric flask: 1000mL capacity

Beaker: 100 mL capacity

B.2 Reagents

Distilled Water

Standard Buffer Solution: Any suitable buffer solutions within the pH range of 9 to 11 for calibrating the pH meter

B.3 Procedure

Ensure that the pH meter is calibrated with standard buffer solutions before use (see also BS 1647).

Weigh 10g ± 0.001 g of the material and transfer to a 1 L volumetric flask.

Partially fill the flask with distilled water, stopper tightly and agitate until the sample is completely dissolved.

Adjust the temperature of the solution and the distilled water to 27°C ± 0.5°C, and fill to the calibration mark with the distilled water.

Stopper the flask, mix thoroughly and allow the solution to stand at a temperature of 27°C for 2 h prior to reading the pH value.
Annex C
(informative)

Determination of matter insoluble in water

C.1 Apparatus

Desiccator

Beaker, capacity 250ml

Steam bath

Gooch crucible

Erlenmeyer filter flask

Watch glass

Oven capable of maintaining 105°C

C.2 Reagents

Ethyl alcohol – Freshly boiled, reagent grade, 95% or higher, neutral to phenolphthalein.

C.3 Procedure

Digest 2g to 10g ± 0.01g of the sample with 200 ml of freshly boiled ethyl alcohol in a covered vessel on a steam bath until the soap is dissolved.

Filter through a weighed Gooch crucible with suction, protecting the solution from carbon dioxide and other acid fumes during the operation by covering with a watch glass.

Wash the residue in the crucible with hot neutral ethyl alcohol until free from soap. Reserve the filtrate and washings.

After filtering and thoroughly washing the residue, changes the receiver, extract the residue with water at 1000°C and wash the residue thoroughly.

Dry the crucible and residue at 1000°C to 1050°C for 3h, cool and weigh the matter insoluble in water.

C.4 Calculation

Matter insoluble in water, percent by mass = 100x \( \frac{m}{M} \)

Where \( m \) = mass in g of dried Gooch crucible and residue – mass in g of empty Gooch crucible; and

\( M \) = mass in g of the sample taken for the test.
Annex D  
(normative)

Determination of free alkali as NaOH

D.1 Apparatus

Bunsen burner or hot plate
Erlenmeyer flask
Burette

D.2 Reagents

Phenolphthalein indicator 1% solution
Hydrochloric acid standard 0.1 N

D.3 Procedure

Heat the reserved filtrate and washings (Annex C) to incipient boiling.
Add 0.5 ml of a 1% solution of phenolphthalein.
Titrate with standard acid solution and calculate the free alkali as sodium hydroxide (NaOH).

D.4 Calculation

Free alkali as NaOH (% by mass) = \( \frac{40 \times 0.1 \cdot V \cdot x100}{M} \)
Where \( V \) = Volume in mL of HCl used in titration; and
\[ M = \text{mass in g of the sample taken for the test (from annex C).} \]
Annex E
(normative)

Determination of net weight

E.1 Apparatus

Analytical balance
Beaker capable of holding the contents of the package of detergent

E.2 Procedure

Weigh all samples with their packages, then weigh the emptied packages.

E.3 Calculation

The average of the difference in weight shall be taken as the net weight per package.

Net weight = Mass in g of full package – mass in g of empty package
Annex F
(informative)

List of additional commonly used detergent ingredients

— Corrosion Inhibitors
— Fluorescent Whitening Agents
— Processing Aids
— Colorants
— Fragrances
— Oxygen Bleach
— Enzymes
— Sud Control Agents
— Fabric Softening Agents
— Other ingredients which provide specialized performance or convenience