SUMMER INTERNSHIP REPORT – 2024

BUREAU OF INDIAN STANDARDS (BIS)

HEADQUARTERS, NEW DELHI

TOPIC – PRE-STANDARDISATION REPORT ON INDIAN STANDARD IS-10523: 2014 (BABY TOILET SOAP - SPECIFICATION)

DEPARTMENT - CHEMICAL DEPARTMENT

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UNDER GUIDANCE – MR.VIRENDRA SINGH (SCIENTIST-E)

ACKNOWLEDGMENT

I am deeply grateful to **Mr. Ajay K Lal** and **Mr. Virendra Singh**, along with the entire team at the **Bureau of Indian Standards (BIS), Delhi**. Their invaluable support, guidance, and outstanding mentorship have greatly enriched my internship experience. Their expertise and commitment have profoundly impacted my knowledge and skills in the field of **CHD-25**.

Being part of the internship program at BIS Delhi has been an incredible privilege. I sincerely appreciate the warm welcome and supportive environment provided by the entire BIS team during my time here.

A special thanks to the Training and Placement Cell at HBTU Kanpur for facilitating this internship opportunity. Without their support, this enriching experience at BIS would not have been possible.

I am eager to assist future HBTU Kanpur students in finding internship opportunities that effectively connect academic study with real-world experience.

Thank you all for your invaluable contributions.

With deep respect and gratitude,
Deepanshu Yadav
Harcourt Butler Technical University
Kanpur Nagar

CONTENT

ABOUT BUREAU OF INDIAN STANDARDS (BIS)

The Bureau of Indian Standards (BIS) is the national body for standardization in India. It functions under the Ministry of Consumer Affairs, Food and Public Distribution and is tasked with the development, implementation, and promotion of standards across various sectors in the country.

Established in 1986, BIS operates under the BIS Act, 1986, which authorizes it to formulate and revise Indian standards through consultations with stakeholders from industry, government, academia, and consumer organizations. The primary goal of BIS is to ensure the quality, safety, and reliability of products, processes, and services, thereby protecting consumer interests and promoting trade and industry.

ACTIVITIES IN WHICH BIS IS INVOLVED

- Standards Formulation
- Product Certification Scheme
- Compulsory Registration Scheme
- Foreign Manufacturers Certification Scheme
- Hall Marking Scheme
- Laboratory Services
- Laboratory Recognition Scheme
- Sale of Indian Standards
- Consumer Affairs Activities
- Promotional Activities
- Training Services, National & International level o Information Services

VISION

The Bureau of Indian Standards (BIS), the National Standards Body of India, resolves to be the leader in all matters concerning Standardization, Certification, and Quality. To attain this, the Bureau would strive:

- To provide efficient timely service.
- To satisfy the customer's needs for quality of goods and services.
- To work and act in such a way that each task performed as individuals or as a corporate entity, leads to excellence and enhances the credibility and image of the Organization.

MISSION

We dedicate ourselves to achieve excellence for effective and timely implementation of the objectives laid down in the Bureau of Indian Standards Act, and providing prompt and efficient services to all stakeholders.

POLICY

BIS is determined to carry out its activities in close cooperation with all concerned organizations and by adopting appropriate management systems, motivating, and ensuring active participation of all the employees.

OBJECTIVES

- Harmonious development of standardization, marking and quality certification.
- To provide new thrust to standardization and quality control.
- To evolve a national strategy for according recognition to standards and integrating them with growth and development of production and exports.

ABOUT NATIONAL INSTITUTE OF TRAINING FOR STANDARDIZATION (NITS)

The National Institute of Training for Standardization (NITS) is a specialized institution dedicated to promoting and enhancing the understanding and implementation of standards in India. Established with the objective of building capacity and expertise in the field of standardization. NITS operates under the guidance of the Bureau of Indian Standards (BIS) and works closely with various stakeholders including industries, government bodies, and educational institutions. NITS offers a wide range of training programs, workshops, and certification courses to professionals, technicians, and other stakeholders to foster a culture of standardization and quality assurance in different sectors. By providing valuable knowledge and skills related to standards, NITS contributes to the overall development and competitiveness of Indian industries while ensuring the safety, reliability, and sustainability of products and services in the market.

The National Institute of Training for Standardization (NITS) offers a variety of training programs aimed at building knowledge and skills related to standardization.

- **Introduction to Standardization**:- This module provides a brief introduction to standardization, emphasizing its importance across various industries. It highlights the benefits, principles, and processes involved in standardization.

- **Standards Development**:- Explore the process of developing standards, including stages like research, drafting, consultation, and finalization. Learn about the roles of standardization bodies and stakeholders in creating standards.

- **Quality Management Systems**:- Understand the concepts of Quality Management Systems (QMS) and how they help organizations achieve and maintain quality standards in operations.

- **Product Certification**:- Examine the process of product certification and conformity assessment. Learn about the requirements for certification, conformity assessment procedures, and compliance with standards and regulations.

- **Metrology and Measurement**:- Focus on the principles of metrology, including units of measurement, calibration, measurement uncertainty, and traceability, highlighting the importance of accurate measurements in standardization.

- **Regulatory Frameworks**:- Gain an overview of national and international regulatory frameworks related to standardization. This module covers the legal aspects of standardization, including the roles of regulatory authorities and the harmonization of standards.

- **Sector-Specific Standards**:- Explore standards and regulations specific to industries such as healthcare, food safety, environmental management, information technology, and automotive.

- **Case Studies and Practical Exercises**:- Engage in case studies and practical exercises to reinforce your understanding of standardization. Work on real-life scenarios, analyze challenges, and develop strategies for effective implementation.

ABOUT CHD-25 (Soaps, Detergents and Surface Active Agents Sectional Committee)

Member Secretary: Mr. Virendra Singh

Scope:

- To formulate Indian Standards for terminology, methods of sampling and test and specifications for soaps.
- Other surface active agents including non-soapy detergents, wetting agents, emulsifying agents, Bio surfactants' including formulated and speciality products and glycerine.
- To co-ordinate with the work of ISO/TC 91 Surface Active Agents.

IS 10523:2014 (BABY TOILET SOAP SPECIFICATION)

SUBJECT AREA

The standard "IS 10523: 2014 (Baby Toilet Soap — Specification)" outlines the comprehensive specifications and standards for baby toilet soaps, ensuring they meet the required safety and quality criteria for infant skincare.

This standard details the requirements for physical and chemical properties, permissible ingredients, and packaging to ensure the product's suitability for delicate baby skin.

It also includes testing procedures and guidelines for obtaining the ECO Mark certification, emphasizing environmentally friendly and sustainable practices.

The document is essential for manufacturers, regulatory bodies, and consumers to maintain consistent quality and safety in baby toilet soaps available in the market.

The standard emphasizes the ethical responsibilities of manufacturers, advocating for transparency and honesty in product marketing. It encourages the dissemination of accurate information about product safety and appropriate usage, fostering trust and integrity in the market.

Overall, IS 10523: 2014 is vital in maintaining high standards in the baby care industry, balancing safety, quality, and environmental considerations.

METHODOLOGY

Literature Survey/Review

Identifying Sources:

I began by identifying credible sources of literature, including standards, academic journals, and industry reports. Key resources included the BIS library, online databases like Google Scholar, and relevant industry publications.

Collection of Data:

I collected and reviewed existing standards such as IS 10523:2014, IS 2888:2004, and IS 13498:2017, focusing on specifications for baby toilet soap and bathing bars.

I also reviewed research papers and articles related to the formulation and testing of baby toilet soap.

Analysis and Synthesis:

After gathering the necessary literature, I systematically analyzed the data, noting down key points, variations in clauses, and recent updates.

I synthesized the information to identify gaps and areas that required further investigation.

Contacting Companies, Laboratories, and Industry Associations

Initial Contact:

I initially contacted potential companies, laboratories, and industry associations through formal emails. This included a well-drafted email explaining the purpose of the industrial visit and my project details.

Follow-Up Communication:

After sending the initial emails, I followed up with WhatsApp messages to ensure the email was received and to prompt a response. This helped in establishing a quicker and more direct line of communication.

Coordination and Scheduling:

Upon receiving responses, I coordinated the visit dates and times that aligned with my project timeline and the companies' availability.

Detailed discussions were held to finalize the agenda and the specific areas of interest for the visits.

Industry Association Contact:
I also reached out to relevant industry associations to gather specific data and insights that could enhance my understanding of industry practices.
A structured questionnaire was developed and sent to the associations to collect detailed information (refer to Annex A for the questionnaire sent to **ASSOCHAM**).
(refer to Annex B for the questionnaire sent to **Indian Home and Personal Care Industry Association, Mumbai)**

Documentation:
I documented all communications and maintained a record of correspondences, confirmations, and follow-ups for future reference.

ANNEX A

Q. What are the current trends in the baby toilet soap market?

The current trends in Baby Toilet soaps are as follows:

1. Enrichment with Vitamins & Oils (Avocado, Olive, Shea Butter) for moisturization purpose.
2. Soap-Free (For E.g. Galderma brand - Cetaphil)
3. Milder chassis of formulations
4. Trend of Hypoallergenic Claims

Q. How has consumer demand for hypoallergenic and organic baby soaps influenced the industry?

Hypoallergenic claim has been widely accepted by consumers this directed manufacturers to start putting this claim on pack hence most of players in market are coming up with “Hypoallergenic Claims”. To support this, manufacturers are now using IFRA compliant fragrances

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Q. What are the Trade statistics (Import/Export) of baby toilet soap?
(You can also attach the pdf of trade data, if any)

Q. Leading large scale Manufacturers of Baby toilet soap?

Johnson & Johnson, Unilever, Galderma- Cetaphil, USV Private Ltd - Sebamed, Himalaya, Mothercare (Mktd by Reliance Retail)

Lot of newer brands are also entering the market.

Q. Leading MSME of baby toilet soap?

Q. Relevant Government schemes and missions?

Government initiatives like Swachh Bharat Mission, which promotes health and hygiene

Q. R & D organisations?

Johnson & Johnson, Unilever, Galderma- Cetaphil, USV Private Ltd - Sebamed, Himalaya, Mothercare (Mktd by Reliance Retail)

ANNEX B

1. What standard practices and processes are followed in the baby toilet soap industry, and how do these align with industry standards?

Baby toilet soaps are made using the same processes that are followed for any soap manufacture. It must comply with the baby toilet soap standard. If it does not, it cannot be called a soap but maybe by another name such as cleanser.

2. Are there international reports highlighting trends, challenges, and opportunities in the baby toilet soap sector? What are the key findings?

I am not aware of any international reports. Typically, the trend, which has been there for a long time and is actually a need, is to make milder and non-allergenic soaps. This means use of milder surfactants and absence of perfume. This also means, the need is to move away from toilet soap as the Grade 1 soap requirement as per Baby toilet soap standard, as this will not allow addition of other surfactants.

3. Who are the major suppliers of raw materials for baby toilet soaps, both in India and globally, and what factors influence supplier selection?

Suppliers are the same as for normal soaps as the formulation is very similar to any Grade I toilet soap. So the usual suppliers of fatty acids, surfactants, fragrance houses etc. I don't remember the name of suppliers.Any company representative should be able to give the information on their suppliers. Some names that come to mind are Adani Wilmar, Wilmar, VVF, Godrej Galaxy surfactants.

Quality in terms of meeting the specification set by a company, cost and availability are the main factors in determining the choice of suppliers.

4. Who are the leading equipment suppliers for baby toilet soap manufacturing, and what essential equipment is required?

There is no special equipment needed for baby toilet soap.It is made using the same equipment used for normal soaps and bathing bars. I don't recall who are the equipment suppliers.

5. Are there in-depth industry reports on manufacturing and market dynamics for baby toilet soaps? How can these aid in strategic decision-making?

I don't think there are any in-depth reports in public.Individual companies might have their own, but these would be confidential. Studies help in determining the consumer needs, the trends, new technologies that can be used to design and market the soaps.

6. What are the differences between various types of baby toilet soaps (e.g., organic vs. conventional) in terms of formulation, manufacturing, and consumer preferences?
Not sure what do you mean by organic. If a soap complies with the baby toilet soap standard, then it pretty much has only soap as the TFM requirement is 76. However, if it is not a toilet soap then, other milder surfactants can be added. Other ingredients such as glycerol that is a humectant and moisturizer can be added.
Consumers want the mildest soap for their babies that also cleans well.Many will go with the recommendation of the pediatricians. Milder and hypoallergenic bars are better for baby skin. How a company markets it soap will also determine the product influence on consumer purchase.

7. What Indian and international standards govern the quality and safety of baby toilet soaps, and how do they affect product development?
As I have already mentioned, BIS baby toilet soap standard governs the baby soap formulation. There are no standards globally, i.e. in EU, US and ASEAN countries.BIS standard does not give space in formulation to add milder surfactants and other ingredients that are beneficial to baby skin.

8. What industry practices and testing methods, beyond those mentioned in IS 10523, are critical for ensuring product quality and GMP compliance?
Nothing special for baby toilet soap. The same practices and GMP followed for toilet soaps are to be followed.

9. What are the current trends and innovations in the baby toilet soap industry, and how are they shaping its future?
See question 2

10. What regulations and requirements must be met when exporting baby toilet soaps from India? How do these differ across countries?
One needs to follow the requirements of the importing country cosmetic rules. Each country has different rules. However, as mentioned in question 7, there are no prodyuct standards in the developed countries.

11. What challenges do Indian manufacturers face when exporting baby toilet soaps, and what strategies can address these challenges?
As far as I know, there are no specific challenges. As long as the product meets the local rules and is safe (will be required to demonstrate safety), it should be okay.

12. How does the import of raw materials impact the cost and pricing strategies of baby toilet soap manufacturers in India?

Import of raw materials is always costlier than local procurement.This is the same for any soap and hence, pricing will depend on this input cost and margin requirement of the company.

13. What are the major global markets for baby toilet soaps, and what are the opportunities in these markets?

In my opinion, baby cleansing products are used everywhere.It is highly unlikely toilet soap is used in developed countries. Potentially, India, China and Asia Pacific regions will be big markets for baby toilet soaps.

14. What tariff and non-tariff barriers impact the import and export of baby toilet soaps, and how can they be navigated?

Mandatory standards such as BIS standard can potentially be a barrier as many products globally will not meet the standard.

15. How do trade agreements and international collaborations affect the import and export of baby toilet soaps?

Don’t know. It will depend on the agreement.

16.Trade data of baby toilet soap?

Don’t have.

LINE MINISTRY OF GOVERNMENT OF INDIA

Central Pollution Control Board (CPCB):

Specific Objectives for Baby Toilet Soap Industry

- To provide an incentive for manufacturers and importers to reduce the adverse environmental impact of baby toilet soap products.
- To reward genuine initiatives by companies to reduce the environmental impact of their baby toilet soap products.
- To assist consumers in becoming environmentally responsible in their daily lives by providing information on environmental factors related to baby toilet soap products, aiding them in making informed purchase decisions.
- To encourage citizens to purchase baby toilet soap products that have a lower environmental impact.
- Ultimately, to improve the quality of the environment and to encourage the sustainable management of resources in the production and distribution of baby toilet soap products.

Specifications Issued by CPCB for Baby Toilet Soap Industry

- "Control equipment" means any apparatus, device, equipment, or system used to control the quality and manner of emission of any air pollutant during the manufacturing process, including devices used to ensure the efficient operation of any production plant for baby toilet soap.
- Suitable air pollution control devices must be installed to meet the particulate matter emissions standards specific to the manufacturing of baby toilet soap.

Micro, Small and Medium Enterprises, Technology Development Centre (MSME-TDC), New Delhi:

MSME-TDC supports smaller manufacturers involved in producing baby toilet soaps. They provide technical assistance, training, and access to modern manufacturing techniques. This support helps ensure that small and medium-sized enterprises (SMEs) can produce high-quality, safe baby toilet soaps. MSME-TDC also helps these businesses comply with relevant standards and regulations

Central Drugs Standard Control Organization (CDSCO), New Delhi:

CDSCO regulates personal care products with medicinal claims, including certain baby toilet soaps. If a baby soap contains therapeutic ingredients or claims benefits beyond basic cleansing, CDSCO ensures that it is safe and effective for use on infants. They may require clinical testing and certification, ensuring that these products do not contain harmful substances and are safe for a baby's sensitive skin.

Ministry of Consumer Affairs, Food and Public Distribution:

The Ministry of Consumer Affairs, Food and Public Distribution in India ensures the safety and quality of baby toilet soaps through:

Consumer Protection: Enforcing laws that protect consumers from unsafe products.
Standardization: Setting and enforcing quality standards via the Bureau of Indian Standards (BIS).
Labeling and Packaging: Regulating clear and accurate product information.
Grievance Redressal: Providing mechanisms for consumers to report complaints.
Market Surveillance: Monitoring compliance and preventing counterfeit products.
Awareness: Educating consumers about safe product choices and their rights.

These roles collectively ensure that baby toilet soaps are safe, compliant, and trustworthy for consumers.

OTHER RELEVANT GOVERNMENT MINISTRIES

Directorate General of Quality Assurance, CQA (Textiles and Clothing), Kanpur:

Although primarily focused on textiles, the CQA can contribute to the quality assurance of packaging materials and related products used with baby toilet soaps. They may conduct quality inspections to ensure that materials and components used in packaging are safe and do not pose any risk to infants.

IOCL (Indian Oil Corporation Limited):

IOCL supports the soap, surfactant, and detergent industries by producing and supplying key raw materials like linear alkylbenzene (LAB), ensuring a steady supply of essential chemicals, and conducting R&D to enhance product quality and innovation.

RELEVANT MISSIONS OR SCHEMES OF GOVERNMENT

1. Swachh Bharat Abhiyan (Clean India Mission)

- **Objective:** Promote hygiene and cleanliness across the country.
- **Impact:** This initiative has highlighted the importance of safe, gentle hygiene products, increasing demand for high-quality baby toilet soaps that are mild and safe for delicate baby skin.

2. Make in India

- **Objective:** Turn India into a global manufacturing hub.
- **Impact:** By encouraging the local production of baby toilet soaps, this scheme reduces dependence on imports and provides incentives for setting up manufacturing units. It's all about making top-notch baby soaps right here in India, boosting the domestic economy.

3. Atmanirbhar Bharat Abhiyan (Self-Reliant India Mission)

- **Objective:** Empower local industries to achieve self-sufficiency.
- **Impact:** Offering financial support and subsidies, this initiative boosts domestic manufacturers of baby toilet soaps. It's all about innovation and raising the bar on product quality, making India proud and self-reliant.

4. Pradhan Mantri MUDRA Yojana (PMMY)

- **Objective:** Provide financial aid to small and micro enterprises.
- **Impact:** This scheme makes it easier for small-scale baby toilet soap manufacturers to access low-interest loans, helping them grow and thrive in the industry.

5. Zero Defect Zero Effect (ZED) Scheme

- **Objective:** Promote quality manufacturing with minimal environmental impact.
- **Impact:** It pushes for the production of baby toilet soaps that are gentle on the skin and the planet, meeting international standards. The goal? High-quality, eco-friendly products that make both moms and Mother Earth smile.

6. Skill India Mission

- **Objective:** Enhance employability through skill development.
- **Impact:** By offering specialized training, this mission ensures workers in the baby toilet soap industry are skilled and up-to-date with modern manufacturing techniques. It's all about boosting productivity and quality.

IDENTIFICATION OF STAKEHOLDERS

1. Leading Industries -large scale enterprises

- Johnson & Johnson Pvt. Ltd.
- Wipro Consumer Care & Lighting
- Himalaya Wellness Company
- Dabur Ltd.
- Karnataka Soaps and Detergents Limited

2. Leading MSME

- A.G. Organica Pvt. Ltd.
- Jasvant Soap Industries
- Agarwal Herbal
- Elegant Cosmed Pvt. Ltd.

3. R&D organisations

- Bureau of Indian Standards (BIS)
- Indian Institute Of Chemical Technology (CSIR-IICT)
- Evyap-Oleo R& D

4. Testing Laboratories

- BIS Bangalore Branch Laboratory
- Bombay Test House

5. Academia

- Indian Institute Of Chemical Technology (CSIR-IICT), Hyderabad
- Harcourt Butler Technical University, Kanpur
- Institute of Chemical Technology, Mumbai

6.Suppliers and Contractors

- VVF (India) Ltd. *(Raw materials supplier and contract manufacturer)*
- Adani Wilmar *(Raw materials supplier)*
- Mil India Pvt. Ltd. *(Equipment supplier)*

7.Financial Institutions and Investors

- State Bank of India (SBI), Kotak Mahindra Bank, IDFC First Bank, HDFC Bank
- Private equity firms and institutional investors

EXPORT DATA

The specific export data for baby toilet soap is not separately available on the DGFT website. However, the export data for all toilet soaps, classified under **HS code 340111**, is accessible. Currently, our country exports to more than 150 countries, with major export destinations are

S.No.	Country	Values in Rs. Lacs	Values in Rs. Lacs		Quantity in thousands	Quantity in thousands	
		2022-2023	2023-2024	% Growth	2022-2023	2023-2024	% Growth
1	AFGHANISTAN	112.94	134.28	18.9	66.55	76.71	15.26
2	AUSTRALIA	1,347.78	1,445.28	7.23	532.64	678.5	27.38
3	BAHARAIN IS	515.33	578.99	12.35	203.19	240.97	18.59
4	BANGLADESH PR	1,446.02	1,469.79	1.64	465.18	466.95	0.38
5	BHUTAN	919.02	879.36	-4.31	192.32	231.14	20.18
6	NEPAL	5,508.48	4,900.61	-11.04	2,023.99	1,506.63	-25.56
7	OMAN	1,239.27	2,142.03	72.85	493.79	956.22	93.65
8	PAKISTAN IR	184.4	59.28	-67.85	115.47	25.97	-77.51
9	SINGAPORE	2,423.98	3,674.44	51.59	874.7	1,665.10	90.36
10	UAE	16,691.40	18,719.90	12.15	6,296.54	7,889.74	25.3
11	UK	3,235.25	2,362.43	-26.98	1,284.65	1,079.38	-15.98
12	USA	6,700.52	6,565.88	-2.01	2,493.77	2,548.03	2.18

IMPORT DATA

The specific import data for baby toilet soap is not separately available on the DGFT website. However, the import data for all toilet soaps, classified under **HS code 340111**, is accessible. Currently, our country imports from more than 30 countries, with major import countries are

S. No.	Countries	Values in Rs. Lacs	Values in Rs. Lacs		Quantity in thousands	Quantity in thousands	
		2022-2023	**2023-2024**	**%Growth**	**2022-2023**	**2023-2024**	**%Growth**
1	SWITZERLAND	17.91	19.83	10.72	1.76	1.67	-4.78
2	THAILAND	1.89	7.61	303.24	0.56	1.3	133.99
3	TURKEY	56.58	9.81	-82.66	5.04	0.45	-91.07
4	UAE	23.97	43.37	80.88	4.43	49.5	1,017.68
5	UK	282.14	409.39	45.1	33.09	44.33	33.98
6	USA	853.05	890.13	4.35	145.4	128.81	-11.41
7	GERMANY	1,595.81	1,622.31	1.66	343.3	305.62	-10.97
8	INDONESIA	3,676.80	5,974.40	62.49	2,310.62	3,529.51	52.75
9	ITALY	26.03	9.34	-64.11	5.82	3.12	-46.33
10	JAPAN	4.51	61.95	1,272.80	0.28	4.25	1,417.86

TECHNOLOGY SCAN AT NATIONAL LEVEL

Sigma Mixer

Sigma Mixer is used to mix soap noodles or soap chips with perfume, color and other additives. Sigma Mixer has two shafts. The shafts have Z shaped stainless steel blades rotating in two troughs of Sigma Mixer. The blades are rotating at different speed for maximum efficiency and homogenization. Mixed materials after mixing are removed from bottom discharge mechanism or by tilting the mixture. The shaft is mounted on heavy duty bearings. The mixing machine is lined with thick sheet of stainless steel. Supporting structure is made from mild steel angles, channels and flats. The mixture is driven by gearbox.

Sigma Mixer

Triple Roll Mill

Before delving into the roles of simplex and duplex plodder machines, it's important to understand what a triple roll mill does. A triple roll mill is used to refine and homogenize materials. It consists of three cylindrical rollers arranged in a horizontal line, and these rollers rotate at different speeds. The material is passed through the gaps between the rollers, which crushes and grinds it, breaking down particles and achieving a uniform consistency

Triple roll mill

Simplex Plodder Machine

In soap manufacturing, simplex plodders are used primarily for refining and homogenizing the soap. This is achieved through their pelletizing head, which ensures a uniform consistency of the soap mass. Additionally, simplex soap plodders can also be utilized to extrude soap bars. When an extrusion cone is attached at the end of the plodder, it enables the formation of soap bars by forcing the homogenized soap through the cone into the desired shape.

Single screw simplex Plodder

Twin screw simplex Plodder

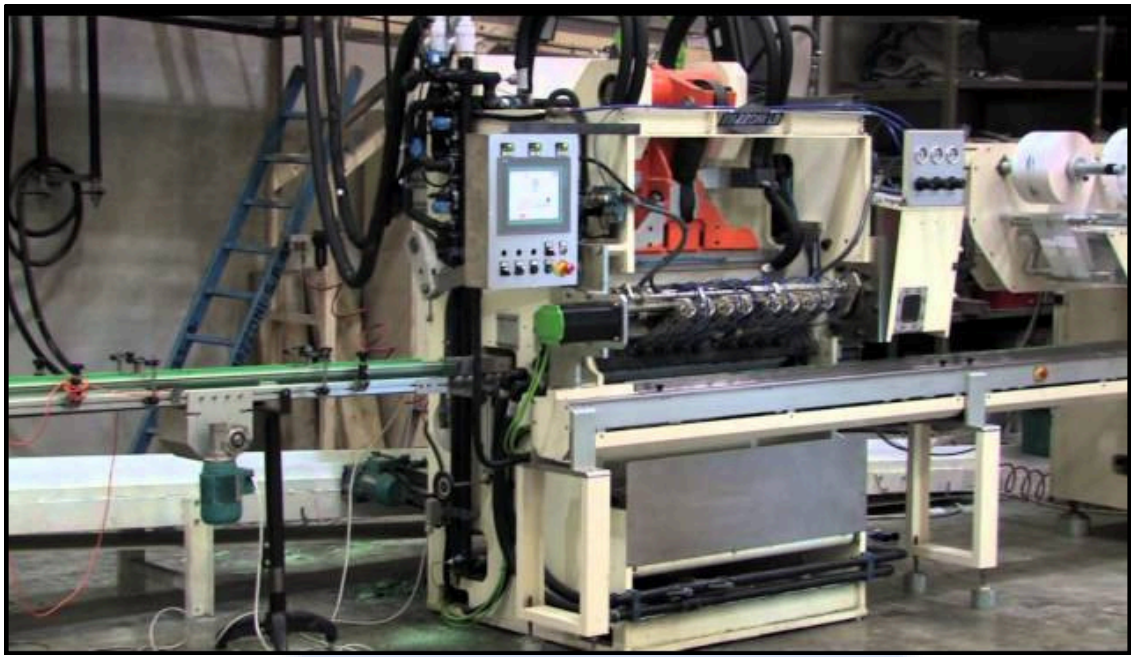
Duplex Plodder

An innovative piece of machinery used in the production of soap is a duplex vacuum plodder equipped with a cone heater, which effectively refines and shapes soap. The integrated vacuum system removes air to ensure a denser and more homogeneous result, while the duplex design's two screws thoroughly mix and homogenize the soap mass. The cone heater at the end of the plodder helps maintain the perfect consistency for smooth extrusion and accurate shaping by applying controlled heat to the extruded soap. The texture, consistency, and look of the soap are all improved by this combination of traits, raising its overall quality.

Duplex Plodder

Mazzoni Stamper Machine - STUR 7

A high-precision tool used in the soap business for stamping and cutting soap bars is the Mazzoni Stamper Machine STUR 7. Every bar of soap is guaranteed to be cut to the correct size and stamped with an identical design by means of this equipment. The STUR 7 model is renowned for its accuracy, efficiency, and capacity to produce large amounts of soap. It is intended to provide each bar a tidy, polished appearance, which is essential for preserving the final product's quality and presentation.



Mazzoni Stamper machine

SUSTAINABILITY IMPACT COVERING ENVIRONMENT, CARBON FOOTPRINT AND CIRCULAR ECONOMY – IN RAW MATERIALS, PROCESSING, USE AND DISPOSAL

Sustainability Impact in the Baby Toilet Soap Industry

1. Raw Materials

Environmental Impact: The choice of raw materials, such as natural oils (e.g., palm oil, coconut oil, or olive oil), significantly impacts sustainability. Sustainable sourcing practices, like using certified sustainable palm oil (CSPO), help reduce deforestation and protect biodiversity.

Carbon Footprint: The extraction and transportation of raw materials contribute to greenhouse gas emissions. Using locally sourced materials can reduce the carbon footprint associated with transportation.

Circular Economy: Utilizing by-products and waste from other industries (e.g., using waste oils for soap production) can promote a circular economy by minimizing waste.

2. Processing

Environmental Impact: The soap manufacturing process can involve energy-intensive steps, especially if synthetic chemicals or high temperatures are required. Implementing energy-efficient technologies and renewable energy sources can mitigate environmental harm.

Carbon Footprint: Energy consumption during manufacturing directly contributes to the carbon footprint. Reducing energy use or switching to renewable sources can lower emissions.

Circular Economy: Recycling water and reusing by-products from the manufacturing process can contribute to a circular economy. Additionally, minimizing waste production and ensuring that any waste is non-toxic and biodegradable are key considerations.

3. Use

Environmental Impact: Baby toilet soaps are often designed to be gentle and free from harsh chemicals, which can reduce their environmental impact. However, ensuring that the ingredients are biodegradable and non-toxic is crucial to avoid harming aquatic life and ecosystems.

Carbon Footprint: The carbon footprint during the use phase is generally minimal, but packaging can play a significant role. Reducing packaging waste or using eco-friendly packaging materials can help.

Circular Economy: Encouraging consumers to recycle packaging and offering refillable options can support a circular economy. Companies can also educate consumers on sustainable use practices, like using water efficiently.

4. Disposal

Environmental Impact: Proper disposal of soap and packaging materials is essential to minimize environmental pollution. Ensuring that packaging is recyclable or biodegradable helps reduce the burden on landfills.

Carbon Footprint: The disposal process, especially if it involves incineration, can contribute to greenhouse gas emissions. Promoting compostable or recyclable packaging can help reduce this impact.

Circular Economy: Emphasizing the importance of responsible disposal and providing avenues for recycling or composting packaging materials can close the loop in a circular economy. Companies can also explore take-back programs or partnerships with recycling organizations.

EVALUATION OF BS 1914:1990 SOAP TYPES FOR BABY SKIN CARE

BS 1914:1990 classifies soaps into three categories: Type A, Type B, and Type S. Each type has unique characteristics that make them suitable for different applications. Understanding these distinctions is crucial for selecting the appropriate soap, especially for delicate uses such as baby skin care.

Type A: High-Specification Soap

Type A soaps are formulated with the most stringent specifications. This category demands the highest standards of purity and composition, minimizing the presence of impurities and potential irritants. The strict requirements of Type A make it an ideal candidate for sensitive skin applications, including baby soaps, as it ensures a gentle and safe product.

Table 1. Properties and test methods

Property	Content			Test method
	Type A	Type B	Type S	
	% (m/m)	% (m/m)	% (m/m)	
1. Total fatty matter content min.	78.0	76.5	79.0	Described in BS 1715 : Section 2.1
2. Lauric oils (e.g. palm kernel oil, coconut oil, Babassu oil) fatty acids content. Expressed as content of acids derived from lauric oils, calculated on total fatty matter, min.	13.0	No requirement	13.0	Described in BS 684 : Sections 2.34 and 2.35
3. Ethanol-insoluble matter content max.	1.25	2.5	2.0	Described in BS 1715 : Section 2.11
4. Free caustic alkali content (Na_2O) max.	0.05	0.05	Not applicable	Described in BS 1715 : Section 2.3 and appendix A of this standard
5. Chloride content (NaCl) max.	0.7	0.8	1.2	Described in BS 1715 : Section 2.7
6. Free fatty acid content, expressed as fatty acid of mean relative molecular mass 248	No requirement	No requirement	2.0 to 10.0	Described in BS 1715 : Section 2.4

Type B: General-Purpose Soap

Type B soaps are designed for general use, meeting standard quality requirements but not adhering to the stringent criteria of Type A. While suitable for everyday applications, Type B may not offer the same level of gentleness and safety required for sensitive skin. Its versatility makes it a good choice for regular household use but less optimal for baby care.

Type S: Soap with Free Fatty Acid Content

Type S soaps are characterized by a specified proportion of Total Fatty Matter (TFM) as free fatty acids, resulting in the absence of free caustic alkali. This unique composition can enhance the mildness of the soap, making it potentially gentle on the skin. However, without the strict specifications of Type A, Type S may not consistently meet the high purity and safety standards necessary for baby products.

Conclusion:

For baby soap formulations, Type A stands out as the most suitable option due to its stringent specifications that ensure higher purity and safety. Type S, with its mild composition, could also be considered, though it may not consistently match the safety standards of Type A. Type B, while adequate for general use, is less suitable for the specialized needs of sensitive baby skin.

INDUSTRY VISIT

Introduction

I got a chance to visit **VVF (India) Ltd** in Baddi, Himachal Pradesh, to observe the production process of Johnson's Baby Soap. This visit was a valuable opportunity to understand the practical aspects of soap manufacturing and the meticulous quality standards maintained by a leading company in the personal care industry.

Overview of VVF (India) Ltd

Founded in 1939 by Godrej Pallonji Joshi in Bombay as "The Vegetable Vitamin Foods Company Pvt. Ltd.," VVF Ltd. has grown from a Vanaspati manufacturer into a global leader in Oleochemicals and Personal Care. Headquartered in Mumbai, the company operates 16 centers worldwide.

VVF is the world's largest contract manufacturer of bar soaps, with an annual production capacity of approximately 300,000 metric tonnes. The company's extensive product range includes bar and liquid soaps, shampoos, conditioners, deodorants, skincare items, and OTC products.

In the oleochemicals sector, VVF produces specialty fatty acids, alcohols, and glycerine, with a capacity of 500,000 metric tonnes per year. Recognized by CHEMIXIL since 2004, VVF is India's largest exporter of these products. The company serves over 1000 customers globally, catering to industries such as pharmaceuticals, automotive, and aviation.

The Baddi plant is notable for its ability to manufacture and package bar soaps and talcum powder.

Manufacturing process

VVF (India) Ltd. uses a batch procedure to manufacture Johnson's Baby Soap, which guarantees exact quality control. Three distinct batches are used in the production, each carefully supervised to ensure that Johnson's Baby goods satisfy the high standards required. This is a thorough explanation of the procedure:

Johnson's Baby Soap Production Process

1.Oleochemical Processing:

- The production starts with the modification of natural oils and fats to create oleochemicals. Key feedstocks such as palm stearin, rice bran oil, and coconut oil are purified by removing impurities like proteins, soaps, ash, and pigments. This is done using activated bleaching earth (0.1% to 2%), which filters the feedstock. The spent filter clay, containing up to 40% fat, becomes the primary waste material.

2.Hydrolysis (Splitting):

- The purified fats and oils undergo hydrolysis to produce free fatty acids and glycerin. This process occurs in a splitting plant at temperatures of 210-250°C and pressures of 30-60 bars. The high yield of splitting (over 97%) is achieved by separating the sweet water from the fat. The resulting fatty acids are then directed to distillation.

3.Fatty Acid Distillation:

- The crude fatty acids are distilled at 160-250°C under very low pressure (2-20 millibars). This distillation process yields light-colored fatty acids with minimal residues. The fatty acids are separated into specific fractions (e.g., C8-C12, C14-C16, etc.) based on their vapor pressures. The refined fatty acids are then used for further processing.

4.Soap Noodle Production:

- The distilled fatty acids, specifically selected for their mildness and suitability for baby skin, are neutralized with sodium hydroxide to produce soap noodles. These soap noodles are formulated to be gentle, with the fatty acids sourced from palm stearin, coconut oil, and other baby-safe oils.

5.Mixing:

- The soap noodles are transferred to a Sigma mixer, where they are combined with the following ingredients tailored for Johnson's Baby Soap:
  - Fragrance: A mild, hypoallergenic fragrance is added for a gentle and pleasing aroma.
  - Color: A soft, baby-safe color is added to give the soap a visually appealing look.
  - Preservatives: Gentle preservatives are included to extend the soap's shelf life.
  - Chelating Agents: Ingredients that enhance the soap's cleansing properties while being safe for baby skin are incorporated.

6.Milling:

- The mixed soap is processed in a triple roller mill. This step removes air to prevent grittiness, refines the texture, and ensures the soap is smooth and consistent, maintaining the gentle qualities required for baby skin.

7.Plodding:

- After milling, the soap passes through two plodders: the Simplex plodder and the Duplex plodder. The Duplex plodder has two sections:
  - Upper Section: A vacuum removes air to create a denser, smoother soap structure suitable for delicate skin.
  - Lower Section: The soap is shaped into a long, continuous bar using a cone heater, ensuring consistent quality.

8.Cutting and Stamping with Mazzoni Stamper Machine STUR 7:

- The long continuous soap bar is processed using the Mazzoni Stamper Machine STUR 7. This high-precision tool is essential for the soap industry, ensuring that each bar is cut to the exact size and stamped with an identical design. Renowned for its accuracy and efficiency, the STUR 7 model can handle large-scale production while maintaining a tidy, polished appearance for each bar.

9.Packaging:

- The stamped soap bars are first placed inside protective pouches to maintain their freshness. Next, they are packaged into branded covers using a Pampac Cartoning machine. Finally, multiple soap packs are bundled together using a Jet pack machine for distribution.

Quality Analysis Report of Johnson's Baby soap

Requirements for Baby Toilet Soap		
Characteristic	**Requirement**	**Results**
i) Total fatty matter, percent by mass, Min	78.0	78.44
ii) Moisture and volatile matter (at 105°C), percent by mass, Max	15.0	12.95
iii) Matter insoluble in alcohol, percent by mass, Max	2.0	0.78
iv) Matter insoluble in water, percent by mass, Max	0.5	0.26
v) Free caustic alkali, as sodium hydroxide (NaOH), percent by mass, Max	0.03	0
vi) Chlorides, as sodium chloride (NaCl), percent by mass, Max	1.0	0.81
vii) Free carbonated alkali, percent by mass, Max	0.5	0
viii) Freedom from rosin	To pass the test	Compliance from Standard
ix) Freedom from grit	To pass the test	Compliance from Standard
x) Nickel content	Nil	Compliance from Standard
xi) Iron content, parts per million, Max	10	<10
xii) Copper (as Cu) contents, parts per million, Max	3	<3
xiii) FFA* (as Oleic), percent by mass	4-7	6.28

NOTE : This data is provided by Quality Control Lab of VVF (India) Ltd.

* This is additional test performed in QC Lab of VVF (India) ltd. for Johnson's baby soap as per IS 286 Clause 7, This test is not mandatory.

Suggestion from VVF (India) Ltd.

1. Analytical Methods for Testing

Recommendation: It is recommended to replace the current methods specified in IS 10523 for the determination of metals such as iron, copper, and nickel with ICP-MS (Inductively Coupled Plasma Mass Spectrometry) and AAS (Atomic Absorption Spectroscopy). These advanced techniques should be adopted to improve the overall efficiency and accuracy of metal detection in baby toilet soap.

Justification: ICP-MS and AAS offer several advantages over traditional methods. They provide faster and more precise results, require smaller sample sizes, and ensure high sensitivity and accuracy in detecting trace metals. These benefits will enhance the quality control process, ensuring that the baby toilet soap meets the highest standards of safety and performance.

Reference :
https://www.oiv.int/standards/international-oenological-codex/part-ii-analytical-and-control-techniques/analytical-and-control-techniques/nickel-determination-by-aas

2. Determination of Free Carbonated Alkali

Recommendation: The existing setup for measuring free carbonated alkali is overly complicated and not easily accessible in the marketplace.

Justification: There is a need to simplify the current assembly or to create new, more user-friendly equipment. The present complexity and limited availability obstruct the testing process, posing challenges for both manufacturers and testing laboratories.

3. Testing for Parabens and Phthalates

Recommendation: Develop testing protocols for parabens and phthalates, as manufacturers of baby soap assert that their products do not contain these chemicals.

Justification: Given the paramount importance of ensuring the safety and health of infants, it is crucial to confirm the absence of these potentially harmful compounds. The Bureau of Indian Standards (BIS) should establish standardized testing protocols to guarantee compliance and protect consumer safety.

Reference :

https://resources.perkinelmer.com/lab-solutions/resources/docs/app-rapid-lcmsms-analysis-of-phtalates-012766a_01.pdf

https://www.researchgate.net/publication/344638102_REVIEW_OF_ANALYTICAL_METHODS_FOR_DETERMINATION_OF_PARABENS_IN_COSMETIC_PRODUCTS

4.VVF (India) Ltd. has raised a query regarding the role of Barium chloride in the determination of free caustic alkali, **IS 286 Clause 7**. They noted that Barium chloride is not used during the entire process, yet it is included in the reagent list and mentioned in the procedure with instructions to omit its addition. Could you please clarify the necessity and role of Barium chloride in this context, given that it is instructed to be omitted?

LAB VISIT

During my internship at the Bureau of Indian Standards (BIS), I had the opportunity to visit **BIS Bangalore Branch Laboratory.** The primary objective of this visit was to conduct a comprehensive analysis of baby toilet soap samples.

With the assistance of the laboratory staff, I performed several critical quality tests, including:

- Total Fatty Matter (TFM): To assess the soap's cleansing efficiency.
- Matter Insoluble in Water: To determine the purity and composition of the soap.
- Matter Insoluble in Alcohol: To further analyze the soap's chemical makeup.
- Moisture and Volatile Matter: To evaluate the product's stability and shelf life.
- Free Caustic Alkali: To ensure the soap's safety and non-irritating properties for infants.

BIS Bangalore branch laboratory

Chemical laboratory

Soap Sample : Johnson's Baby Soap

1. Test Method for Determination of Total Fatty Matter (TFM)

Test equipment:

1. Sulphuric Acid
2. Ethyl Ether
3. Acetone
4. Methyl Orange Indicator
5. Steam bath
6. Distillation Assembly
7. Air Oven
8. Analytical balance
9. Hot plate
10. Stop watch
11. Glassware such as separating funnel, conical flask, Measuring cylinder, etc.

Procedure:

1. Weighing and Dissolving the Sample

• Weigh accurately 5 to 10 grams of your soap sample, depending on its anhydrous soap content.

• Dissolve this sample in a 250-ml conical flask with 100 ml of water. Warm the flask gently to help dissolve the soap completely.

2. Acid Addition and Fatty Acid Separation

• Add dilute sulphuric acid to the solution. Use a methyl orange indicator to add the acid in slight excess. The indicator will help you judge when you've added enough acid.

• Insert a small funnel into the neck of the flask.

• Heat the flask gently to a temperature not exceeding 60°C. Continue heating until the fatty acids separate as a clear layer on top.

• Add 50 ml of sodium chloride solution to help separate the fatty acids further.

• Cool the mixture to room temperature.

3. Separating and Washing

• Transfer the contents of the flask quantitatively to a separating funnel.

• Draw off the aqueous acid layer into another separating funnel.

• Shake the acid layer with three 50-ml portions of ethyl ether. This will help extract the fatty acids into the ether layer.

• Combine the ether layers used for washing and then extract the fatty acids from the ether with 10-ml portions of water until the extracts are no longer acidic (as indicated by the methyl orange indicator).

4. Mixing and Filtering
• Mix the water portions used for washing and shake with 20 ml of ether. This ensures that all fatty acids are transferred to the ether layer.
• Wash this ether layer with water until the wash water is neutral to the methyl orange indicator.
• Combine the ether solution. If necessary, filter the solution, washing the filter paper with ether to ensure all fatty acids are collected.

5. Evaporating Ether and Acetone Addition
• Transfer the ether solution to a suitable, weighed vessel.
• Distil off the ether slowly on a steam bath.
• Add 5 ml of acetone to the residue in the flask. This helps remove any remaining traces of ether.
• Warm the flask on the steam bath for about a minute.
• Remove the flask from the bath and, while rotating the flask at an angle of 45°, direct a current of dry air into its mouth for about a minute to remove most of the acetone.

6. Drying and Weighing
• Place the flask in an air oven at about 90°C for 10 minutes.
• Remove the flask from the oven and blow with air as before for about 15 seconds.
• Allow the flask to cool and weigh it.
• Return the flask to the steam oven for another 10 minutes and blow for 15 seconds.
• Repeat this process until the difference between two consecutive weighing is less than 0.005 g. This ensures all solvent has evaporated and only the fatty matter remains.

Calculation:
Soap sample weight (A): 5.0363 gm
Empty Beaker weight(B): 96.3531 gm
Final Beaker weight (with fatty matter): 100.4485 gm
Mass of fatty matter: 100.4485 – 96.3531 = 4.0954 gm

TFM (%) = (Mass of fatty matter/mass of soap sample) x 100
= (4.0954/5.0363) x 100
TFM (%) = 81.317

2. Test Method for Determination of Matter Insoluble in Alcohol

Test equipment:

1. Ethyl Alcohol
2. Reflux condenser
3. Steam bath
4. Gooch Crucible or Filter Paper
5. Air oven

Procedure:

1. Weighing and Refluxing the Sample

a. Weigh the Sample:

- Accurately weigh 2 to 10 grams of the soap sample.

b. Reflux with Ethyl Alcohol:

- Place the weighed sample in a reflux apparatus.
- Add 200 ml of freshly boiled ethyl alcohol to the flask.
- Reflux (heat) the mixture on a steam bath until the soap is completely dissolved.

2. Filtering the Solution

a. Prepare the Filter:

- Filter Paper: Place the filter paper in a weighing bottle and dry it in an air oven at 105 ± 2°C with the cover removed. Cool it in a desiccator and weigh it.
- Gooch Crucible: Prepare it with a pad of asbestos fiber. Wash the pad with water, alcohol, and ether, then dry it to a constant mass at 105 ± 2°C, cool in a desiccator, and weigh it.

b. Filter the Solution:

- Filter the dissolved soap solution into a filter flask using the prepared filter paper or Gooch crucible with suction.
- Protect the solution from carbon dioxide and other acid fumes by covering it with a watch glass.

3. Washing the Residue

a. Wash with Ethyl Alcohol:

- Wash the residue on the filter several times with ethyl alcohol at approximately 60°C.

4. Drying and Weighing the Residue

a. Dry the Residue:

- Dry the filter paper or Gooch crucible with the residue at 100 ± 2°C for 3 hours.

- Cool it in a desiccator and weigh the total matter insoluble in alcohol.

Calculation:
Soap sample weight: 2.0641 gm
Empty Gooch crucible weight: 59.1555 gm
Final Gooch crucible weight (containing insoluble matter): 59.1589 gm
Weight of matter insoluble in alcohol: (59.1589 – 59.1555) = 0.0034 gm
Matter Insoluble in Alcohol (%) =(Insoluble matter weight/ soap sample weight) x 100
= (0.0034/2.0641) x 100
= 0.164

3. Test Method for Determination of Matter Insoluble in Water

Test equipment:
1. Ethyl Alcohol
2. Filter Paper or Gooch Crucible
3. Air oven
4. Hot plate
5. Distilled water
6. Digital Balance

Procedure:
1. Preparation and Extraction with Alcohol
a. Weigh the Sample:
- Weigh accurately 2 to 10 grams of your soap sample.

b. Reflux with Ethyl Alcohol:
- Place the weighed sample in a reflux apparatus.
- Add 200 ml of freshly boiled ethyl alcohol to the flask.
- Reflux (heat) the mixture on a steam bath until the soap is completely dissolved.

c. Filter the Solution:
- Prepare a filter paper or Gooch crucible:
- Filter Paper: Place it in a weighing bottle and dry it in an air oven at 105 ± 2°C with the cover removed. Cool it in a desiccator and weigh it.
- Gooch Crucible: Prepare it with a pad of asbestos fiber. Wash the pad with water, alcohol, and ether, then dry it to a constant mass at 105 ± 2°C, cool in a desiccator, and weigh it.
- Filter the dissolved soap solution into a filter flask using the prepared filter paper or Gooch crucible.

- Use suction to assist the filtration process and protect the solution from carbon dioxide and other acid fumes by covering it with a watch glass.

d. Wash with Ethyl Alcohol:

- Wash the residue on the filter several times with ethyl alcohol at approximately 60°C

2. Extraction with Hot Water

a. Change the Receiver:

- After filtering and washing the residue with hot ethyl alcohol, change the receiver to a clean container.

b. Extract with Hot Water:

- Extract the residue with successive portions of water at about 60°C.
- Wash the residue thoroughly on the filter paper or in the crucible until all soluble materials are washed away.

c. Dry the Filter and Residue:

- Dry the filter paper or the crucible with the residue at 100 ± 2°C for 3 hours.
- Cool it in a desiccator and weigh it.

Calculation:

Soap sample weight: 2.0070 gm
Empty Gooch crucible weight: 36.7448 gm
Final Gooch crucible weight (containing insoluble matter): 36.7485 gm
Weight of matter insoluble in water: (36.7485 – 36.7448) = 0.0037 gm
Matter Insoluble in Water (%) = (Insoluble matter weight/ soap sample weight) x 100
= (0.0037/2.0070) x 100
= 0.184

4.Test Method for Determination of Moisture and Volatile Matter

General:

• Oven Method: Measures moisture and volatile matter by drying in an air-oven at a specified temperature.

• Distillation Method: Measures only moisture content by distilling water under reflux with xylene or toluene.

Applicability:

• Oven Method: Suitable for all soaps.

• Distillation Method: Preferred for soaps containing:

1. Sodium silicate
2. Linseed oil and oxidizing oils
3. High glycerol content
4. Sodium hydrogen carbonate, perfume, ammonia, alcohol, carbolic acid, persalts

Oven Method Procedure:

1. Weigh 5.00 ± 0.01 g of material in a petri dish/ weighing bottle.
2. Dry in an air-oven at 105 ± 2°C to constant mass.
3. Cool in a desiccator and weigh.

Calculation:

Empty weighing bottle (A): 88.3153 gm

Soap sample weight (B): 5.1595 gm

Final Weighing bottle weight (C): 93.3574 gm

Moisture & volatile matter (%) = {(C-A)/B} x 100

= (0.1174/5.1595) x 100

= 2.259

5.Test method for determination of Free Caustic alkali

Procedure:

Same process till the washing of filtrate with ethyl alcohol for separating the insoluble matter in Gooch crucible and soluble matter in flask

Now add Methyl orange indicator in flask, If it turn pink which shows presence of Free caustic alkali in soap

Calculation:

After adding methyl orange indicator in the flask containing soluble matter solution, there is no colour change which shows absence of free caustic alkali in soap

PROPOSAL FOR AMENDMENTS TO IS 10523:2014

I have highlighted the clause numbers in the ***Table 1, page no. 1*** of **IS 10523** that need to be changed and have also added the corrected clause numbers on the side.

Table 1 Requirements for Baby Toilet Soap

(*Clause* 4.3)

Sl No.	Characteristic	Requirements	Method of Test, Ref to		
			Cl in IS 286	Cl in IS 74	Annex of this Standard
(1)	(2)	(3)	(4)	(5)	(6)
i)	Total fatty matter, percent by mass, *Min*	78.0	15 *16*	—	—
ii)	Moisture and volatile matter (at 105°C), percent by mass, *Max*	15.0	4.2 *5.2*	—	—
iii)	Matter insoluble in alcohol, percent by mass, *Max*	2.0	5 *6*	—	—
iv)	Matter insoluble in water, percent by mass, *Max*	0.5	7 *8*	—	—
v)	Free caustic alkali, as sodium hydroxide (NaOH), percent by mass, *Max*	0.03	6 *7*	—	—
vi)	Chlorides, as sodium chloride (NaCl), percent by mass, *Max*	1.0	10 *11*	—	—
vii)	Free carbonated alkali, percent by mass, *Max*	0.5	2 *29*	—	—
viii)	Freedom from rosin	To pass the test	—	23	—
ix)	Freedom from grit	To pass the test	—	—	B
x)	Nickel content	Nil	—	—	C
xi)	Iron content, parts per million, *Max*	10	—	—	D
xii)	Copper (as Cu) contents, parts per million, *Max*	3	—	—	E

1

(Page 2, clause 4.4.2.1) — Substitute the existing sentence with the following:

'**4.4.2.1** The material shall neither contain any synthetic detergent when tested as per the method given in Annex B and Annex C of IS 4955 nor any phosphate when tested as per the method given in **21** of **IS 286**'

1974 and *Air (Prevention and Control of Pollution) Act,* 1981 along with the authorization, if required under the *Environment (Protection) Act*, 1986, while applying for ECO Mark.

4.4.2 *Specific Requirements*

4.4.2.1 The material shall neither contain any synthetic detergent when tested as per the method given in Annex B and Annex C of IS 4955 nor any phosphate when tested as per the method given in 20 of IS 286.

4.4.2.2 The material shall pass the test for dermatological safety when evaluated as per the method prescribed in IS 13424.

The details of conditions under which the licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

6 SAMPLING

6.1 For this purpose, scale of sampling and preparation of test samples shall be as prescribed in 3.1, 3.2, and 3.3 respectively of IS 286.

6.2 Number of Tests

6.2.1 Tests for the determination of total fatty matter and free caustic alkali shall be conducted on each of the individual samples separately.

(Page 2, clause 6.1) — Substitute the existing sentence with the following:

'**6.1** For this purpose, scale of sampling and preparation of test samples shall be as prescribed in **4.1, 4.2,** and **4.3** respectively of **IS 286'**

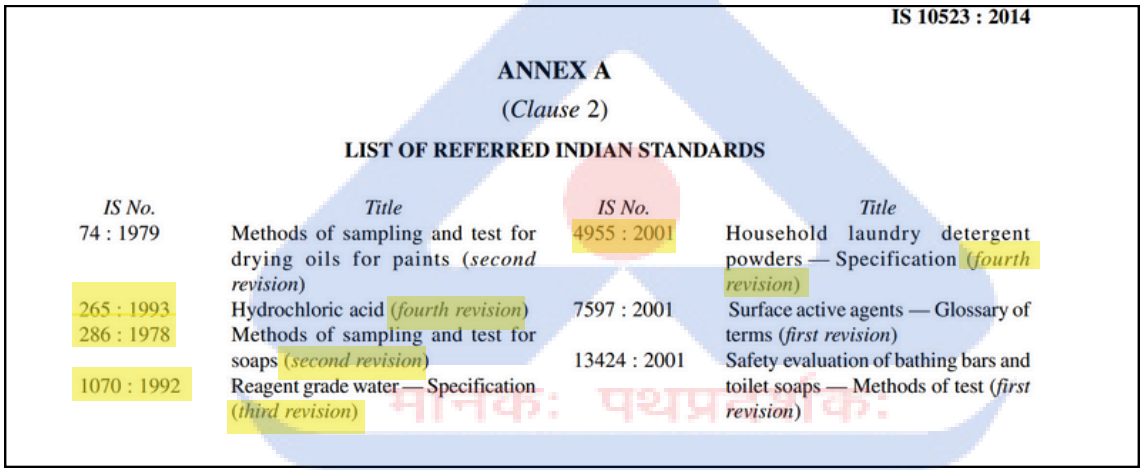
(Page 3, Annex A) — Substitute

IS 265 : 1993 Hydrochloric acid — Specification (*fourth revision*) with **IS 265 : 2021** Hydrochloric acid — Specification (*fifth revision*)

IS 286 : 1978 Methods of sampling and test for soaps (*second revision*) with **IS 286 : 2018** Methods of sampling and test for soaps (*third revision*)

IS 1070 : 1992 Reagent grade water — Specification (*third revision*) with **IS 1070 : 2023** Reagent grade water — Specification (*fourth revision*)

IS 4955 : 2001 Household laundry detergent powders — Specification (*fourth revision*) with **IS 4955 : 2020** Household laundry detergent powders — Specification (*fifth revision*)



IS 10523 : 2014

ANNEX A

(*Clause* 2)

LIST OF REFERRED INDIAN STANDARDS

IS No.	*Title*	*IS No.*	*Title*
74 : 1979	Methods of sampling and test for drying oils for paints (*second revision*)	4955 : 2001	Household laundry detergent powders — Specification (*fourth revision*)
265 : 1993	Hydrochloric acid (*fourth revision*)	7597 : 2001	Surface active agents — Glossary of terms (*first revision*)
286 : 1978	Methods of sampling and test for soaps (*second revision*)	13424 : 2001	Safety evaluation of bathing bars and toilet soaps — Methods of test (*first revision*)
1070 : 1992	Reagent grade water — Specification (*third revision*)		

NOTE-

The revision of **IS 286** not only affected the clause numbers in **IS 10523:2014** but also affected the following standards-

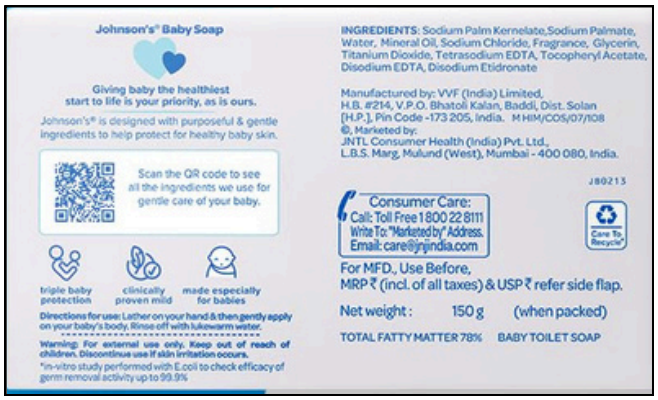
IS 2888:2004 TOILET SOAP- SPECIFICATION

IS 13498:2017 BATHING BAR — SPECIFICATION

COMPARISON BETWEEN BABY TOILET SOAP AND BABY BATHING BAR

Feature	Baby Toilet Soap	Baby Bathing Bar
Total Fatty Matter (TFM)	Grade 1 being the highest with ~80% (min 78%)	Generally around 40%
Insoluble Matter	Lower insoluble content due to higher fatty material	Higher insoluble content compared to toilet soaps
Primary Ingredients	High-quality fatty acids derived from natural oils and fats	Surface-active agents (surfactants) suitable for bathing purposes
Additional Ingredients	May contain processing aids, coloring agents, permitted antioxidants, preservatives, germicides, superfatting agents, humectants, and fragrances	Similar to toilet soaps, with possible inclusion of other additives declared on the label
Skin Feel	Provides a richer, creamier lather due to higher TFM, offering better moisturization suitable for delicate baby skin	Produces a lighter lather; may feel less moisturizing compared to toilet soaps
Gentleness on Skin	Generally considered gentler owing to higher natural fatty content	Still suitable for bathing but may be less moisturizing
Ideal Use	Recommended for babies with dry or sensitive skin needing extra moisturization	Suitable for regular cleansing purposes
Regulatory Standards	Comply with **IS 10523:2014** , specification of Baby toilet soap	Comply with **IS 13498:2017** ,bathing bars Specification , ***No separate standard for baby bathing bar***

Baby Toilet Soap



Johnson's Baby soap

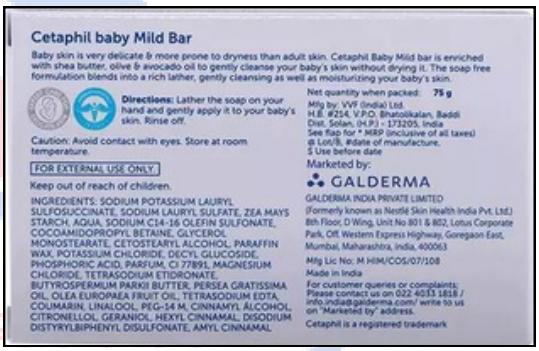
Santoor baby soap

Major Ingredients for Baby Toilet Soaps:

Sodium Palm Kernelate/Sodium Palmate: Common base ingredients in soaps, derived from palm oil.
Water: Used as a solvent.
Glycerin: Moisturizing agent.
Mineral Oil (Johnson's): A moisturizing and emollient ingredient.
Milk Cream, Almond Oil, Saffron Extract (Santoor): Additional moisturizing and nourishing agents specific to Santoor Baby Soap.

Baby bathing bar

Dove baby bathing bar



Cetaphil baby bathing bar

Major ingridients for baby bathing bar:

Aqua (Purified Water): Acts as a solvent.
Sodium Trideceth Sulfate: Creates foam and cleanses the skin *(Synthetic surfactant)*.
Sodium Lauroamphoacetate: Gentle cleanser and foam stabilizer *(Synthetic surfactant)*.
Cocamide MEA: Foaming agent and thickener *(Synthetic surfactant)*.
Styrene/Acrylates Copolymer: Forms a protective barrier on the skin.

SAFETY EVALUATION OF BABY TOILET SOAP

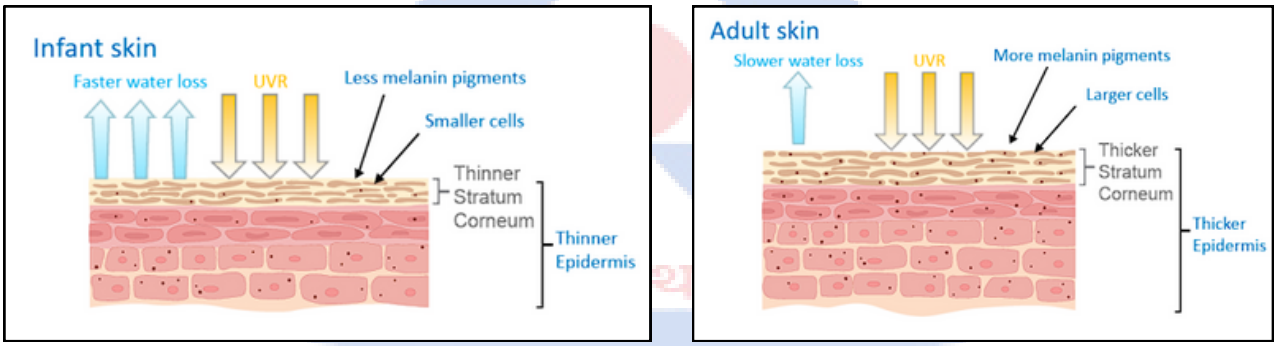
Importance of Skin Barrier

The skin serves as a crucial protective barrier that shields the body from various external factors, including mechanical trauma, allergens, irritants, and water loss. This function is particularly important for infants, whose skin barrier is not fully developed, making them more susceptible to skin issues.

Infant Skin Characteristics

Infant skin has a thinner stratum corneum and epidermis compared to adult skin, being approximately 30% and 20% thinner, respectively. This underdevelopment can lead to higher permeability and vulnerability to irritants.

At birth, infants have a higher skin surface pH, which gradually decreases to levels similar to adults' after about a year. A lower pH helps to maintain low protease activity, essential for the skin's defense mechanisms and the synthesis of lipid lamellae, vital components of a healthy skin barrier.



Common Infant Skin Conditions

Due to the characteristics of infant skin, conditions like napkin/diaper dermatitis, skin infections, and atopic dermatitis (AD) are common in the first year of life. The breakdown of the skin barrier can be exacerbated by gene-environment interactions, leading to conditions like AD. The use of soap and harsh surfactants can further deteriorate the skin barrier, emphasizing the need for mild baby care products.

In Vitro Testing Methods for Safety Evaluation

To ensure the safety of baby care products, various in vitro testing methods are employed:

EpiSkin®:

A commercial epidermal tissue model that uses reconstructed human epidermis from normal human keratinocytes. This model is cultured on a collagen matrix at the air-liquid interface, closely mimicking the structure of human skin. It is used to evaluate skin irritation potential in test samples.

SkinEthic™ Human Corneal Epithelium (HCE) Model:

This model consists of transformed human corneal keratinocytes grown on an inert polycarbonate filter at the air-liquid interface. It forms a stratified, well-organized epithelium that resembles the human cornea. The model assesses eye irritation potential in test samples.

Hen's Egg Test on the Chorioallantoic Membrane (HET-CAM):

This test uses the chorioallantoic membrane (CAM) of mid-term SPF egg embryos, which resembles the human cornea's structure and has a complete vascular system. It is an alternative method for assessing eye irritation, mimicking the response seen in traditional rabbit conjunctiva evaluations. Due to variability and ethical concerns in traditional animal testing, in vitro methods like HET-CAM have gained prominence.

Evaluation and Results

The safety of 12 baby care products was evaluated using the three in vitro methods mentioned above. Additionally, a consumer research study was conducted over two weeks to further assess the safety. The results indicated that none of the test products caused irritation according to the EpiSkin® and SkinEthic™ models, and consumer research. However, the HET-CAM test showed positive results, indicating some potential for irritation that was not detected by the other methods.

OTHER RELEVANT NATIONAL AND INTERNATIONAL STANDARD ON PRODUCTS AND TEST METHODS

There are various standards both national and international on products and test methods –

IS 74 : 1979
Methods of sampling and test for drying oils for paints (second revision)

IS 265 : 2001
Hydrochloric Acid Specifications (Fifth Revision)

IS 1070 : 2023
Reagent Grade Water Specification (Fourth Revision)

IS 286 : 2018
Methods of sampling and test for soaps (Second Revision)

IS 4955 : 2020
Household Laundry Detergent Powders — Specification (Fifth Revision)

IS 7597 : 2001
Surface active agents — Glossary of terms (first revision)

IS 13424 : 2001
Safety evaluation of bathing bars and toilet soaps — Methods of test (first revision)

BS 1914:1990
Specification for Toilet soap

JIS K 3301:1985/AMENDMENT 1:2007
Toilet soap - Specification

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