SUMMER INTERNSHIP REPORT – 2024

BUREAU OF INDIAN STANDARDS (BIS)

HEADQUARTERS, NEW DELHI

TOPIC – PRE-STANDARDISATION REPORT ON INDIAN STANDARD IS-6047: 2009 (SCOURING PRODUCTS FOR UTENSIL CLEANING SPECIFICATION)

DEPARTMENT - CHEMICAL DEPARTMENT

SUBMITTED BY :
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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,
Ayush Bajpai
Harcourt Butler Technical University
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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-6047: 2009 (SCOURING PRODUCTS FOR UTENSIL CLEANING SPECIFICATION)

SUBJECT AREA

The standard (**IS 6047: 2009 (Scouring Products for Utensil Cleaning - Specification)** outlines the specifications, requirements, sampling methods, and testing procedures for scouring products used in utensil cleaning. This includes different forms such as bars, liquids, pastes, and powders. It ensures that these cleaning products meet certain standards for performance, safety, and quality.

This standard is essential for maintaining hygiene and cleanliness in households and commercial establishments. It specifies the acceptable levels of active ingredients, cleaning efficacy, lather formation, moisture content, and other properties critical to the product's performance. The standard also includes guidelines for packaging, marking, and labeling to ensure that products are safely handled and used.

In addition, the standard addresses the testing methods required to evaluate these cleaning products, including the assessment of active ingredients, alkalinity, cleaning efficiency, and foam production. These procedures are crucial for quality control and compliance with Indian regulatory standards.

Manufacturers must provide up-to-date information on the use and safety of their products, including any potential risks or protective measures. This helps users implement appropriate safety procedures and comply with relevant regulations.

Overall, the standard contributes to the effective and safe use of scouring products, promoting public health by preventing contamination and enhancing the durability and cleanliness of kitchen utensils.

LINE MINISTRY OF GOVERNMENT OF INDIA

a.) Central Pollution Control Board (CPCB)

The specific objectives of the scheme are as follow:

- To provide a standard for the quality and safety of scouring products used for utensil cleaning.
- To ensure that products meet specified performance criteria for effective cleaning while minimizing adverse effects on health and the environment.
- To guide manufacturers in producing scouring products that comply with established safety and performance standards.
- To assist consumers in selecting products that are effective and safe for cleaning utensils.
- To improve public health and safety by ensuring the quality of scouring products

From the Scouring Products Specification Series issued by CPCB:

- "Scouring Product" means any substance used for cleaning utensils which is designed to remove dirt, stains, or residues from surfaces.
- Performance Criteria: The product must meet specified criteria for cleaning efficiency, including the ability to effectively remove stains and residues without causing damage to the utensil surface.
- Safety Requirements: The product must not contain harmful substances that could pose health risks to users or cause adverse environmental impacts.
- Environmental Impact: The product should be formulated to minimize environmental impact, including considerations for biodegradability and safe disposal.
- Testing Standards: Products are to be tested according to the specifications outlined in IS 6047:2009 to ensure compliance with performance and safety requirements.

b.) Micro, Small and Medium Enterprises (MSME), Technology Development Centre

- **Support for SMEs:** Offers technical and financial support to small enterprises, helping them improve product quality and adhere to standards.
- **Training and Market Access:** Provides skill development and market access assistance to boost competitiveness.

c.) Central Drugs Standard Control Organization (CDSCO)

- **Chemical Safety Regulation:** Oversees the safety of chemicals used in scouring products, ensuring they comply with health regulations.
- **Health Risk Assessment:** Evaluates potential health risks and provides labeling guidelines for consumer safety.

d.) Ministry of Consumer Affairs, Food & Public Distribution

- To develop and update standards, such as IS 6047: 2009, ensuring scouring products meet safety and effectiveness criteria.
- To oversee testing and certification through BIS, verifying that scouring products comply with established standards.
- To ensure scouring products are non-toxic and safe for consumer use.
- To educate consumers about product standards and quality for informed purchasing decisions.
- To handle consumer complaints and enforce compliance with standards through inspections and penalties.
- To collaborate with industry stakeholders to continuously improve product standards and practices.

OTHER RELEVANT GOVERNMENT MINISTRIES

a.) Indian Oil Corporation Limited
Provides raw materials for scouring products, ensuring quality and adherence to industry standards.

b.) Directorate General of Quality Assurance
Oversees quality control and standardization in textiles and clothing, including scouring products, ensuring they meet specified performance and safety criteria.

c.) Ministry of Environment, Forest and Climate Change (MoEFCC)
Sets environmental regulations and standards for scouring products, ensuring they meet ecological safety requirements and minimize environmental impact.

d.) State Pollution Control Boards (SPCBs)
Monitor and enforce local environmental standards, including scouring products' compliance with pollution control regulations.

RELEVANT MISSIONS OR SCHEMES OF GOVERNMENT

The Indian government has initiated programs to support the scouring products industry by enhancing quality, innovation, financial aid, and workforce skills, aiming to make Indian products high-quality, eco-friendly, and globally competitive.

a.) Swachh Bharat Abhiyan (Clean India Mission)

- **Objective:** Enhance sanitation and cleanliness across the nation.
- **Impact:** The initiative has significantly increased the demand for high-quality scouring products, encouraging the development of eco-friendly cleaning solutions that help maintain hygiene standards.

b.) Make in India

- **Objective:** Position India as a leading global manufacturing hub.
- **Impact:** By supporting local production of scouring products, this scheme helps reduce reliance on imports and offers various incentives to set up manufacturing units, promoting self-reliance and boosting the domestic economy.

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

- **Objective:** Strengthen local industries to achieve self-sufficiency.
- **Impact:** This initiative provides financial support and subsidies to domestic manufacturers of scouring products, encouraging innovation and improving product quality to make India more self-reliant.

d.) Skill India Mission

- **Objective:** Improve employability through skill development programs.
- **Impact:** By offering specialized training for workers in the scouring products industry, this mission boosts productivity and encourages the adoption of modern manufacturing techniques, ensuring a skilled workforce.

e.) Startup India Initiative

- **Objective:** Foster startups with support in funding and regulation.
- **Impact:** This initiative encourages new and innovative startups in the scouring products sector by providing access to funding and mentorship, fostering research and development that can lead to cutting-edge solutions in cleaning technologies.

IDENTIFICATION OF STAKEHOLDERS

1. Leading Industries - large scale enterprises

- Hindustan Unilever Ltd
- Fena (P) Ltd
- Jyothy Laboratories Ltd
- Pitambari Products Pvt. Ltd
- Wipro Consumer Care and Lighting
- Shantinath Detergents Private Limited
- RSPL Group

2. Leading MSME

- Alok Industries
- Voda chemicals Pvt. Ltd.
- VShine Industries
- Kavit Polybind Pvt. Ltd.
- Aajkal Care
- Kresko Chemicals

3. R&D Organisations

- Bureau of Indian Standards (BIS)
- Clean Control Corporation
- Shriram Institute For Industrial Research
- Indian Institute Of Chemical Technology (CSIR-IICT)

4. Testing Laboratories

- BIS, Central Laboratory (CL)
- Shriram Institute For Industrial Research, Laboratory
- idma laboratories Ltd.
- National Chemical Laboratory (NCL), Pune

5. Academia

- Indian Institute of Technology (IIT), Bombay
- Harcourt Butler Technical University, Kanpur
- Institute of Chemical Technology (ICT)

6. Suppliers and Contractors:

Raw materials suppliers:

- Reliance Industries
- Indian Oil Corporation
- Aaykay Detergents
- Kresko Chemicals
- Nirma

Equipment suppliers:

- Razon Engineering Company Private Limited
- Mil India Pvt. Ltd.

Construction and maintenance contractors:

- local and national companies

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 commodity classified under **HS Code 34054000** comprises scouring pastes, powders, and related scouring preparations. It is distributed in kilograms (KGS) to 69 countries globally. The list of major importing countries is attached below for reference.

S.No.	Country	Values in Rs. Lacs	Quantity in thousands				
		2022-2023	2023-2024	% Growth	2022-2023	2023-2024	% Growth
1	AUSTRALIA	6.56	7.84	19.54	4.01	5.31	32.54
2	BHUTAN	180.9	223.74	23.68	171.8	121.89	-29.05
3	BRUNEI	0.04	0.13	200	0.02	0.06	222.22
4	U A E	237.02	422.31	78.18	279.18	905.49	224.34
5	U K	17.81	278.51	1,463.97	7.51	237.34	3,059.87
6	U S A	45.13	47.31	4.83	26.8	23.92	-10.73
7	NEPAL	595.93	701.72	17.75	1,024.23	1,278.97	24.87
8	NETHERLAND	0.54	15.15	2,710.29	0.47	15.16	3,092.63
9	NEW ZEALAND	0.46	3.23	603.47	0.19	2.07	1,010.75
10	NIGERIA	0.28	1.1	292.05	0.13	0.39	196.97
11	CAMEROON	0.09	0.3	223.29	0.08	0.25	236
12	CANADA	7.4	6.72	-9.19	5.7	3.85	-32.39
13	GHANA	0.04	0.38	954.06	0.01	0.45	6,385.71

IMPORT DATA

The commodity under **HS code 34054000** includes scouring pastes, powders, and various other scouring preparations. According to DGFT data, these products are imported by more than 20 countries around the world. Below is a list of the main countries that import these items for reference.

S. No.	Country	Values in Rs. Lacs	Quntity in thousands				
		2022-2023	2023-2024	% Growth	2022-2023	2023-2024	% Growth
1	SWITZERLAND	1.72	0.48	-71.89	NA	NA	-
2	TURKEY	13.54	197.59	1,359.66	20.29	223.21	1,000.29
3	U A E	4.46			0.72		
4	U K	317.15	0.1	-99.97	235.68		
5	U S A	53.02	74.86	41.17	9.76	24.76	153.62
6	GERMANY	8.9	8.82	-0.88	0.89	0.8	-9.92
7	HUNGARY	606.47	659.54	8.75	501.12	535.68	6.9
8	ITALY	650.57	459.84	-29.32	672.92	344.75	-48.77
9	JAPAN	44.77	0.71	-98.41	3.6	0.07	-98.17

Note: NA- Data Not Available.

TECHNOLOGY SCAN AT NATIONAL LEVEL

SIGMA MIXER:-

Sigma Mixer proves crucial while making bar soaps used in washing utensils because it has strong kneading functions and brilliant blending capacity.The robust mixing function as well as stiffen dough capability make Sigma Mixer an indispensable machine in preparing cleansing agents as well as soap powders.

This is possible due to its two Σ (sigma) shaped blades that strongly shear renders it ideal for handling thick products such as detergents.Today's output will consist of two major parts: one is rigid base section and other is a region where flattening occurs.It also includes an electrical low voltage control system to fine tune its operations; a transmission system consisting of motors driven gear set that are used to coordinate the blades and hydraulic system that opens or closes softly.

The motor speed of the mixer is controlled by an elastic connection during operation while inverter is used for changing speeds. Blades that rotate at 28 or 38 revolutions per minute are actually rotating on different speeds.

Different kinds of Sigma Mixers can use electric heat, steam, hot oil circulation or water as sources of heating and cooling. There are various methods of discharging materials, including screw extrusion, ball valves and hydraulic dumping cylinders. SUS304 stainless steel material has been adopted to make it free from contamination thus making it a perfect machine for producing cleaning bars with a uniform texture and performance.

MULTISCREW:-

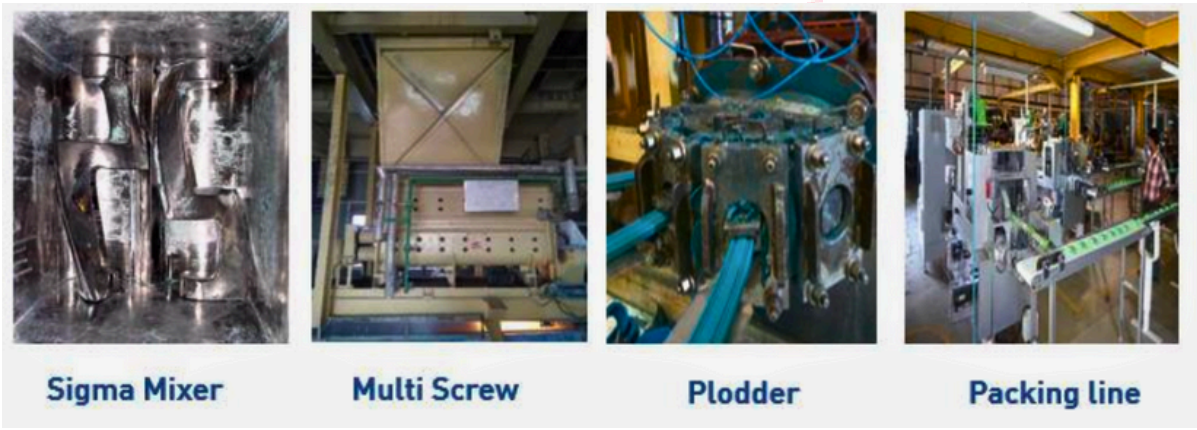
Cleaning bar formulas are mixed and shaped using a multiscrew extruder. By continually forcing the liquid through several screws, it improves homogeneity and guarantees uniform consistency and efficient ingredient blending for the best cleaning results.

PLODDER:-

The plodder is a device that shapes and sizes the cleaning bar mixture by molding and extruding it. It exerts pressure on the mixture, eliminating air bubbles and producing a homogenous texture—a crucial step toward the longevity and high quality of the finished product.

PACKING MACHINES:-

Automates the packaging of cleaning bars by filling, sealing, and labeling them. It ensures consistent quality and efficiency in the packing process.



BUCKET ELEVATOR:-

In a production line, a bucket elevator is used to move powdered or granular materials vertically. It transports ingredients or processed material between various steps in the production of cleaning bars, including storage to mixing or extrusion to packaging. Its construction minimizes spills and contamination by ensuring the gentle and effective handling of materials.

FAS MIXER:-

Used for blending and mixing surfactants, abrasives, and other components in utensil cleaning gels, ensuring a uniform consistency and effective cleaning performance.

YAS MIXER:-

Ideal for homogeneous mixing of viscous and high-viscosity components in cleaning gels, enhancing the gel's stability and cleaning efficiency.

FAS Mixer

Ystral Mixer

DUST COLLECTORS:-

During the manufacturing of tool cleaning bars and powders, dust collectors are used to capture airborne particles and dust generated during the manufacturing process. They help maintain air quality, keep workers safe, and prevent product contamination by effectively filtering and collecting dust.

TECHNOLOGY SCAN AT INTERNATIONAL LEVEL

AUTOMATION AND ROBOTICS:-

Automation and robotics are revolutionizing manufacturing processes by precisely managing tasks such as filling, capping and packaging. This technology increases productivity, improves safety and reduces errors, making production lines more efficient. Robots operate continuously, ensuring consistent product quality and easily adapt to different product lines, while reducing labor costs and material waste.

BENEFITS:-

- Increase productivity with continuous operation.
- Ensure consistent product quality through precise tasks.
- Reduce labor costs and material waste.
- Flexibly adapt to different product lines.
- Improve safety by handling hazardous tasks.

ADVANCED FORMULATION TECHNOLOGY:-

Advanced formulation technology adds ingredients such as enzymes and nanomaterials to create superior, environmentally friendly cleaning products. This design provides superior cleaning power while addressing environmental and safety concerns. By using biodegradable materials, manufacturers can meet consumer demand for environmentally friendly products and gain a competitive advantage with innovative solutions.

BENEFITS:-

Reduce environmental impact with biodegradable ingredients.
Provides excellent cleaning by effectively removing grease and dirt.
Attract consumers looking for safe and environmentally friendly products.
Provide competitive advantage through innovative solutions.
Improve health and safety by reducing harsh chemicals.

In summary, different automation technologies can be difficult to identify as they are used internationally. The focus is on improving product quality and performance through innovations such as biodegradability and advanced processes. Technologies such as smart sensors and machine learning improve cleaning efficiency and help create high-quality dishwashing products..

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

RAW MATERIALS:-

Using sustainable raw materials reduces environmental damage and supports biodiversity. The choice of renewable or recyclable materials reduces the ecological footprint of Scouring products and ensures that the extraction of resources does not harm the ecosystem or consume natural resources.

PROCESSING:-

Sustainable processing involves adopting energy-efficient technologies and reducing waste. By reducing harmful emissions during production and optimizing the use of resources, the environmental impact is reduced and green manufacturing practices are promoted.

USES:-

When used, cleaning products must be effective but gentle on the environment. Choosing products that require less water, are free of harmful chemicals and are designed for long-term performance will help reduce the overall environmental impact over their lifetime.

DISPOSAL:-

Sustainable disposal means designing cleaning products to be recycled or safely composted at the end of their life.Implementing take-back programs and ensuring materials are recyclable or biodegradable reduces waste going to landfill and supports a circular economy by closing product life cycles.

Sustainable Development Goals (SDGs):-

Cleaning products can align with the SDGs by promoting responsible consumption (Goal 12) through sustainable sourcing and disposal practices. Reducing carbon emissions and waste contributes to climate action (Goal 13) and supporting life on land and water (Goals 14 and 15) by reducing pollution and conserving resources.

LAB VISIT

In order to conduct testing for IS 6047:2009 Scouring Products for Utensil Cleaning - Specification, I got the opportunity to visit the BIS Sahibabad laboratory during my internship at the Bureau of Indian Standards (BIS). It was during this visit that I was able to participate in significant testing procedures and learn about different testing approaches and quality assurance techniques.

Essential aspects of scouring products were evaluated in the core testing activities, which included:

1. Retention on 250 Micron IS Sieve
2. Measuring the Lather Volume
3. Determining Content Volatile and Moisture
4. Material Irresoluble in Alcohol

BIS SAHIBABAD LABORATORY

Apart from the previously discussed fundamental assessments, I additionally witnessed and comprehended a range of alternative methods of testing and benchmarks mentioned throughout the assessment procedure. Because of this experience, I was able to understand the complexities of testing procedures.

I also reviewed the testing methods and reports for Active matter, percent by weight. Min and Active (reserve) alkalinity in ml (Max) , which I have attached below.

TOPIC – LAB REPORT OF INDIAN STANDARD IS-6047: 2009 (SCOURING PRODUCTS FOR UTENSIL CLEANING SPECIFICATION) (TYPE 4 POWDER)

1.) METHOD OF TEST FOR SIEVE ANALYSIS

APPARATUS:-

- 250-micron IS Sieve
- Beaker
- Balance/Scale
- Steam-bath
- Stirring rod
- Drying oven (For drying the sieve and its contents at 100 ± 5°C.)
- Camel-hair brush (For transferring the dried residue from the sieve to the tared glass dish.)
- Tared glass dish

PROCEDURE:-

- Measure 50.00 g of the test sample and place it in a beaker.
- Add 200 ml of water to the beaker.
- Heat the mixture on a steam bath, stirring frequently until the soluble salts are dissolved.
- Pour the mixture through a sieve.
- Rinse the beaker multiple times with water to ensure all residue is transferred to the sieve.
- Use a fine stream of tap water to wash the insoluble matter on the sieve.
- Continue washing until the amount of residue on the sieve remains constant.
- Place the sieve in a basin and wash it for an additional 2-4 minutes.
- Repeat the washing process for another 2-4 minutes.
- Dry the sieve and its contents at 100 ± 5°C.
- Use a camel-hair brush to transfer the contents of the sieve to a tared glass dish.
- Determine the weight of the residue.

CALCULATION:-

- Weight of Sample (**W**) = 50.0861g

1. Weight of 250 micron sieve 1st time = 0.367
2. Weight of 250 micron sieve 2nd time = 0.368
3. Weight of 250 micron sieve 3rd time = 0.368

- Weight of 250 micron sieve (Wavg) = 0.36766 g
- Residue Wt.(**w**) = 0.001g
- Retention on 250-micron IS Sieve, (Percent by weight) = 100×(w/W)
  = 100×(0.001/50.0861)
  = **0.0019974 g**

2.) ASSESSMENT OF LATHER

APPARATUS:-

- 250-ml graduated measuring cylinder (with a least count o f I ml)
- 5FH water(50ppmCaC03),
- Product to be assessed
- Clamp and stand
- Stopwatch
- 500-ml volumetric flask
- Three trained members.

PROCEDURE:-

- Prepare 500 ml of 0.25% aqueous test solution in a volumetric flask using 5 FH water.
- Pipette out 50 ml of the test solution into a 250-ml graduated cylinder.
- Shake the cylinder upside down 10 to 15 times.
- Place the cylinder on a flat surface of the table.
- Wait for '1' minutes for the aqueous layer to separate.
- Shake the cylinder upside down once to even out the foam level.
- Measure the volume of foam (excluding aliquot water) in ml.
- Repeat the test in triplicate with 3 different panel members.

CALCULATION:-

Initial Wt. (A) = 50 ml (for all three)

1.) Final Wt. (**B**) = 100-110 ml. , (**B - A**) = 60 ml
2.) Final Wt.(**C**) = 100-110 ml. , (**C -A**) = 60 ml
3.) Final Wt.(**D**) = 100-110 ml. . (**D -A**). = 60 ml

Volume of foam (excluding aliquote water) in ml **= 60 ml**

3.) MATTER INSOLUBLE IN ALCOHOL (PERCENT (REQ. 80%) BY WEIGHT)

APPARATUS:-

- Covered vessel
- Ethyl alcohol
- Steam bath
- Filter paper or Gooch crucible
- Oven

PROCEDURE:-

- Accurately weigh 2 to 10 g of the sample.
- Place the weighed sample in a covered vessel.
- Add 200 ml of freshly boiled ethyl alcohol to the vessel.
- Cover the vessel and place it on a steam bath.
- Heat until the soap is completely dissolved.
- Filter the Solution
- Wash the filter paper or the Gooch crucible several times with hot ethyl alcohol to remove all alcohol-soluble substances.
- Preserve the filtrate for further analysis
- Dry the filter paper with the residue at 100 ± 2°C for 3 hours.
- After drying, cool the filter paper or crucible to room temperature in a desiccator.
- Weigh the filter paper or crucible to determine the total matter insoluble in alcohol.

CALCULATION:-

Sample wt.(**M**) = 8.2883 g
Filter paper wt. 1.0987 g
Mass of matter insoluble in alcohol (**m**) = 7.756 g

Matter insoluble in alcohol, percent by mass = (m/M)×100
= (7.756/8.2883)×100
= **93.577693**

4.) DETERMINATION OF MOISTURE AND VOLATILE MATTER

APPARATUS:-

- Analytical Balance
- Petri Dish
- Air-Oven
- Desiccator
- Thermometer
- Tongs or Forceps

PROCEDURE:-

- Accurately weigh 5.00 ± 0.01 g of the material.
- Place the material in a petri dish with a diameter of 6 to 8 cm and a depth of 2 to 4 cm.
- Dry the material in an air-oven at 105 ± 2°C to achieve constant mass.
- Cool the petri dish and material in a desiccator.
- Weigh the material again after cooling.
- Repeat heating and weighing until the difference in net loss in mass is not more than 0.1% over successive 1-hour heating periods, indicating constant mass is attained.

CALCULATION:-

Sample Wt. = 5.0029 g
Wt. of Dish = 131.6011 g
Residue Wt.= 0.0985 g
Dish+ Residue Wt. = 131.6996 g

Formula = (Residue / Sample Wt.) ×100
= (0.0985/ 5.0029) ×100
= **1.968858** (2% By wt.)

5.) ACTIVE MATTER, PERCENT BY WEIGHT (MIN)
(APPROX REPORT)

APPARATUS:-

- Balance
- 150-ml Beaker
- Hot Plate
- Glass Rod
- Filter Paper
- Filter Funnel
- 100-ml Flask
- Distilled Water
- Wash Bottle
- Water Tap
- Measuring Cylinder
- Test Tube
- Hydrochloric Acid (3N)
- Dropper/Pipette
- Burette

RESULT:-

Active matter, percent by weight (Min) :- **4.80545406** **Approx** 5% by wt.

6.) METHOD OF TEST FOR ACTIVE (RESERVE) ALKALINITY
(APPROX REPORT)

APPARATUS:-

- Balance
- 250-ml Beaker

- 100-ml Beaker
- Distilled Water
- Whatman Filter Paper No. 42
- Filter Funnel
- Pipette
- Magnetic Stirrer
- pH Meter
- pH Meter Electrode
- Burette
- Burette Stand and Clamp
- 0.1 N Hydrochloric Acid Solution
- Stirring Rod
- Graduated Cylinder

RESULT:- Active (Reserve) alkalinity, in ml.(Max) :- **9 ml Approx**

INDUSTRY VISIT

Date of Visit: 20/07/2024
Location: Fena Pvt. Ltd., Surajpur, Greater Noida
Subject: Observation of Production Processes for IS 6047 Utensil Cleaning Products

I had the privilege of touring the production facility of **Fena Pvt. Ltd.** in Surajpur, Greater Noida, to gain a full understanding of the manufacturing processes for all **IS 6047:2009** products. The tour offered valuable insights into dishwasher product development processes and practical aspects, focusing on **Bar and Powder formulations.** This opportunity helped me expand my understanding of the industry and gain a deeper insight into the practical application of standards in industrial operations.

FENA PVT. LTD., SURAJPUR, GREATER NOIDA

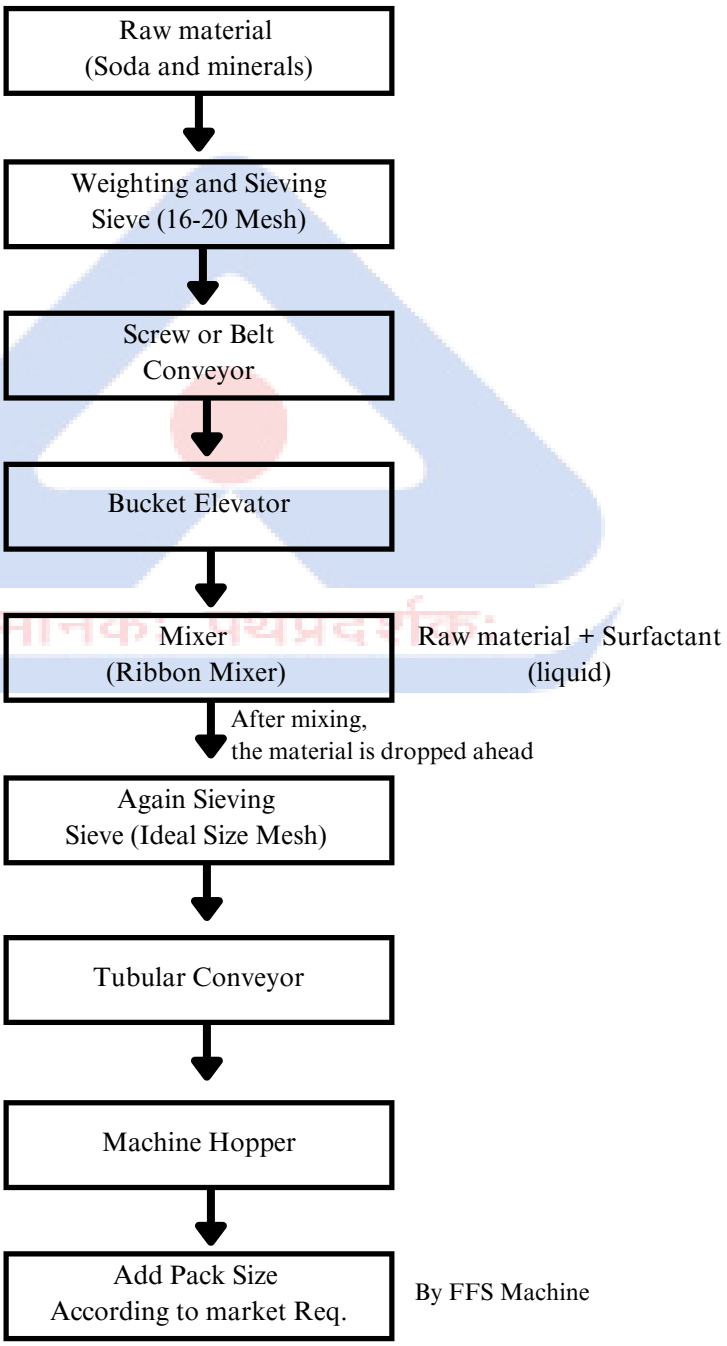
FENA was established as a first-generation business venture in 1976. Fena has steadily developed to its current standing as a prominent leader in the sector of Fabric Care, Home Care, and Personal Care products in India, with a developing International business that offers a diverse product line.
Today, Fena is a professionally managed firm dedicated to achieving its goals through a well-defined value system. The company has developed fundamental strengths in production and marketing, and it is constantly increasing its unique product portfolio in the Fabric, Home, and Personal Care areas.

Surajpur Plant Operations:-
Fena's Surajpur Greater Noida factory focuses in the manufacture of detergent and home care products.

This plant is particularly notable for producing utensil cleaning goods under the NIP brand. The operation efficiently produces both NIP utensil cleaning bars and powders, with an average daily production of 18 to 20 tons for each product type. This excellent production capability demonstrates Fena's commitment to satisfying market needs while maintaining high quality standards throughout its manufacturing operations.

The primary raw material, LABS (an anionic surfactant), is mainly supplied by Indian Oil, Reliance, and Nirma.

FLOW CHART MANUFACTURING PROCESS (POWDER)



- Raw materials, including soda and minerals, are prepared for the process. Sieving is performed using sieves with a mesh size **between 16 and 20** to ensure consistency in particle size.

- The prepared raw materials are transferred to a mixer. In this stage, a surfactant in liquid form is added through a pipeline to achieve the desired consistency and properties.

- After mixing, the material is dropped onto a belt conveyor, which moves the material forward along the production line.

- The material undergoes sieving again to meet industry standards, ensuring that no lumpy material is present. This step helps maintain the quality and uniformity of the product.

- The sieved material is then transferred via a tubular conveyor to the machine hopper for further processing.

- Packing is carried out according to the required size and market specifications. A **form fill seal (FFS) machine** is utilized for this purpose.

- The machine operates on a **volumetric base cup setting**, and packaging is done based on the density of the material.

- To ensure accuracy, the packed items are weighed, and their weight is cross-checked to meet the specified standards.

- Surfactant labs use LABS by reacting it with sulfuric acid to produce **LABSA (Linear Alkylbenzene Sulfonic Acid)**.

PROCESS ANALYSIS:-

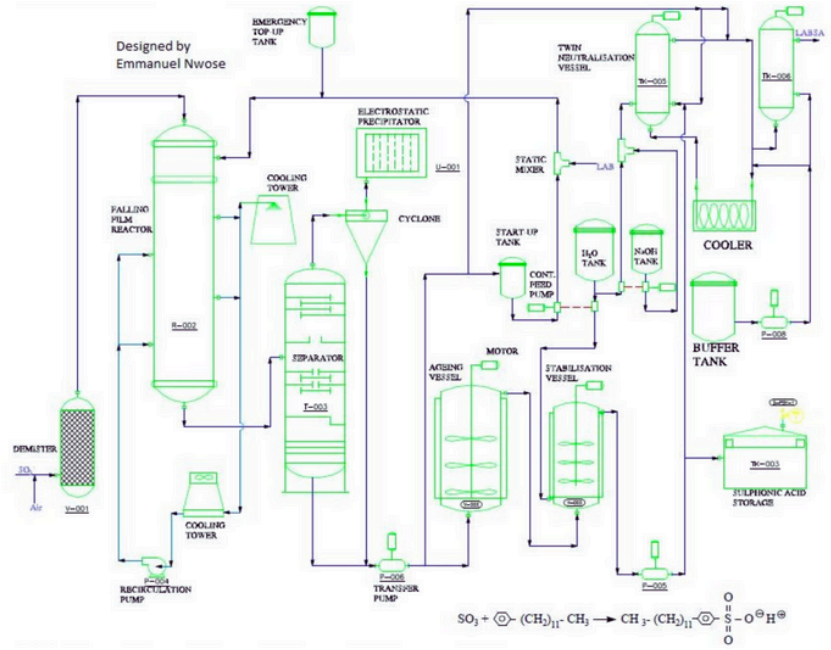
- **Powder Material Preparation**: The powder material is taken and mixed. During this mixing process, the reaction occurs.

- **Reaction and Transformation**: The reaction happens in real-time during the mixing phase. Initially, a semi-solid, dove-like consistency is formed. As the mixing continues, it transforms into a powdery form.

- **Sieving**: After mixing, the semi-solid material is sieved to obtain the final powder form.

PRODUCTION OF LINEAR ALKYL BENZENE SULPHONIC ACID (LABSA)

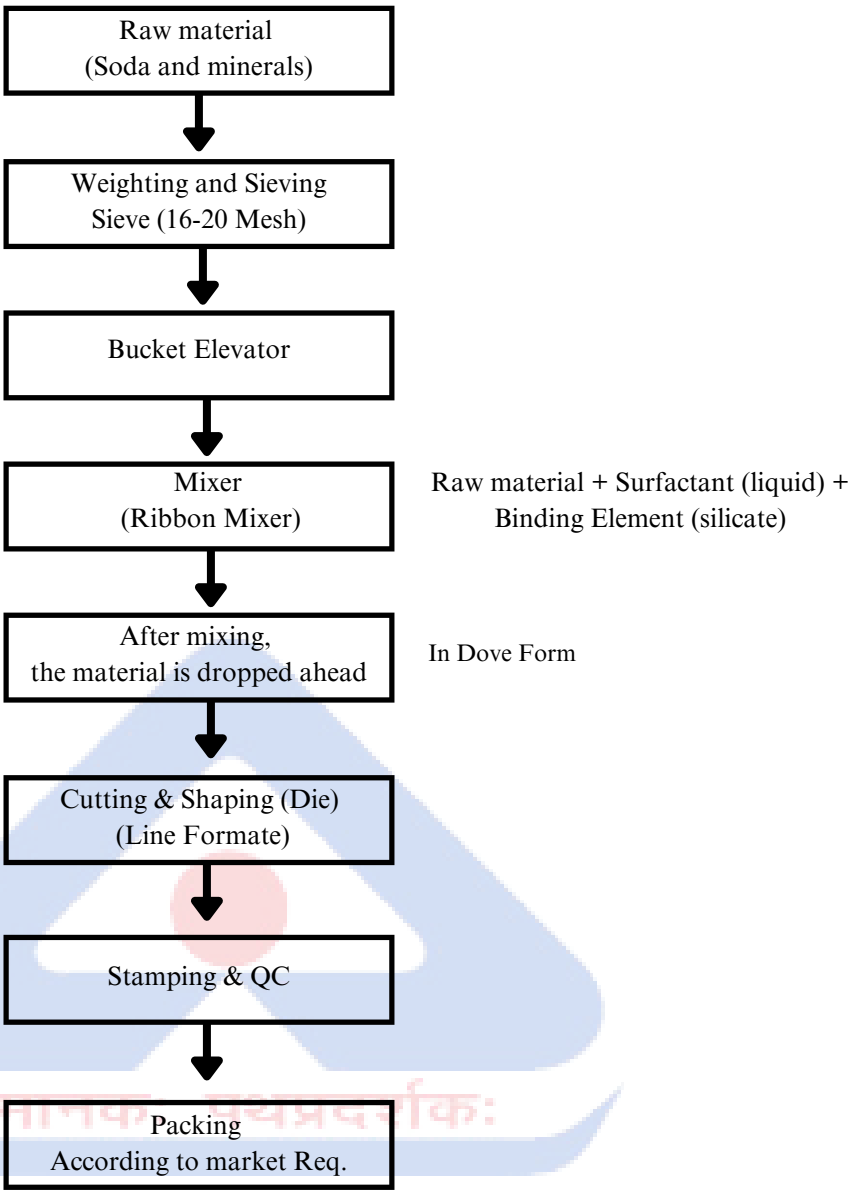
LABSA (**Linear Alkyl Benzene Sulphonic Acid**) is produced by the sulphonation reaction of Alkyl Benzene with **Sulphur trioxide (SO)**. Some other processes might desire the use of **Oleum** or **Sulphuric acid**. The final decision will depend on various factors which might include the availability of raw material, location of the plant, the size of the plant, operation mode of the plant, to mention a few. Nevertheless, considering major factors such as cost, availability, flexibility and safety, SO still remains the preferential reagent for the reaction which is as shown on the flowsheet.



FLOW CHART OF LABSA

LABSA is one of the major active ingredients for the production of soaps and detergents. Importantly, it forms a greater percentage of raw materials for the production of liquid soaps. Its major producer includes Chemithon and Ballestra. Similar steps are used by both companies to produce LABSA. However, the technology is slightly different especially at the sulphonation stage where Chemithon utilizes the Falling Film Reactor or Jet Reactor while Ballestra employs the Stirred Tank Reactor/Cascade Reactor or Multitube Falling Film Reactor.

FLOW CHART MANUFACTURING PROCESS (BAR)



The production process of utensil cleaning bars begins with the selection and preparation of raw materials. These materials are carefully sieved to remove any impurities and ensure consistency. The sieved raw materials are then transported via a bucket elevator to a high-temperature mixer. In this stage, the ingredients are combined to form a homogeneous mixture. Additionally, any bars that have been returned from the market, products that require recycling, or those collected from quality control processes are also added back into the mixer for reprocessing.

The mixing process results in the formation of a dough-like substance. This dough is crucial as it forms the base material for the bars. It is then directed into a production line where it is cut and shaped into individual bars.

This process is facilitated by a die, which ensures each bar is uniformly shaped. Following shaping, the bars undergo a stamping process, which often includes the imprinting of brand names or product details on the bars for identification.

Each bar is subjected to a thorough physical quality check to ensure it meets the required standards. Any bars that do not pass this inspection are removed from the production line for further evaluation. Finally, the bars that pass quality control are packaged and prepared for distribution. The packaging process is designed to protect the bars during transportation and storage.

Batch-to-Batch Consistency Check for Bars and Powders:-

For ensuring batch-to-batch consistency in bar and powder production, we conduct tests at regular intervals. The following parameters are evaluated:

- **Stamp**: Regular inspections ensure the stamp quality meets our standards.
- **Size**: We consistently check the size of each product to guarantee uniformity.
- **Moisture Content**: Moisture levels are tested to ensure they fall within the acceptable range.

- To maintain quality, we take samples every 2 to 3 hours and perform parameter testing.
- This rigorous approach ensures that there is no wastage at any stage of production. The products have been successfully marketed for several years, and after a certain period, data is collected for reproduction, further minimizing any potential wastage.

Storage Conditions :-

Products should be stored under normal conditions, free from natural elements and moisture. There are no specific temperature conditions; storage is maintained at room temperature for optimal balance.

Equipment

Our production plant is equipped with an in-house team that handles all necessary equipment for efficient operation.

Key Points:-

- **Compliance with Standards**: Our product meets the minimum and maximum requirements as per BIS standards. After fulfilling these criteria, the level of excellence offered to consumers becomes a company trade secret.

- **Packaging**: The materials used for packaging, whether it be bars, powders, or gels, are primarily biodegradable.

- For example, laminates used in bars and powders, and the plastic bottles or handy bags used for gels, comply with pollution control board guidelines.

- **Design and Cost Dependency**: The choice of laminate, design, and overall packaging depends on the product cost, which is determined by various factors.

Lab Details (NIP POWDER & BAR)

In our lab, we perform two main types of consistency checks: chemical and physical.

Physical Tests

The following aspects are examined during physical tests:

- Shape
- Size
- Color
- Texture
- Dissolution

Chemical Tests

For chemical tests, we focus on:

- Active Matter
- Lather, Moisture
  pH of **Gel**:- 6.8 to 7.2 , **Bar** (1% soon):- 10 to 10.5

These tests are conducted **batch-to-batch on a daily basis** to ensure product consistency and quality.

Specialized Tests

In addition to the daily checks, we also perform specialized tests:

- Cleaning Efficiency
- Surface Damage
- Tough Soil Cleaning

These tests are conducted on **alternate days, rather than daily,** due to their complex nature.

Key Points

- The company's specifications are determined based on product formulation.
- The Bureau of Indian Standards (BIS) sets the standards that must be met.
- The company creates its own specifications that comply with BIS standards.
- These specifications are provided to the production unit, which uses them to produce the product.
- After the product is produced, testing batches are created to monitor whether the product meets the established specifications.

SAFETY FACTORS IN SCOURING PRODUCT MANUFACTURING PLANTS

1. Masks
2. Fire Extinguishers
3. Dust Collectors
4. Ventilation Systems
5. Protective Clothing

Nip Nature & Shakti Dishwash Bar

Nip Nature & Shakti Dishwash Powder

During my visit to **Fena Pvt. Ltd.** Surajpur Greater Noida plant, I learned about the manufacturing procedures behind their NIP brand utensil cleaning products, which include bars and powders. This experience helped me better understand the practical aspects of **IS 6047: 2009** compliance and production methodologies.

GATHERING INSIGHTS ON NIP DISHWASH GEL: R&D DATA COLLECTION THROUGH QUESTIONNAIRES AND TELEPHONIC CONVERSATIONS

NIP DISHWASH GEL PRODUCTION

The primary raw materials used in the formulation of NIP Dishwash Gel are liquid substances, notably surfactants such as Sodium Lauryl Ether Sulfate (SLES) and various water-soluble components. During formulation, free ions present in the raw materials are addressed using Ethylenediaminetetraacetic Acid (EDTA), which serves as a chelating agent.

In the process, when mixing SLES with acid slurry, the acid slurry is neutralized using Sodium Hydroxide (NaOH). This reaction allows the incorporation of SLES and other ingredients essential for the gel. To achieve the desired viscosity, thickening agents such as salt are employed.

A single universal mixer is utilized for the blending process, although planetary mixers are also available for use.

Packaging and Quality Control of NIP Dishwash Gel:-

Packaging Materials: NIP Dishwash Gel is packaged in bottles and caddy packs.
Packing and Labeling Process: The packing and labeling are carried out using a volumetric filling machine. This ensures accurate and consistent filling of the product into the containers.
Production Capacity: The plant has a production capacity ranging from 10 to 20 tons. This capacity may vary depending on market demand.

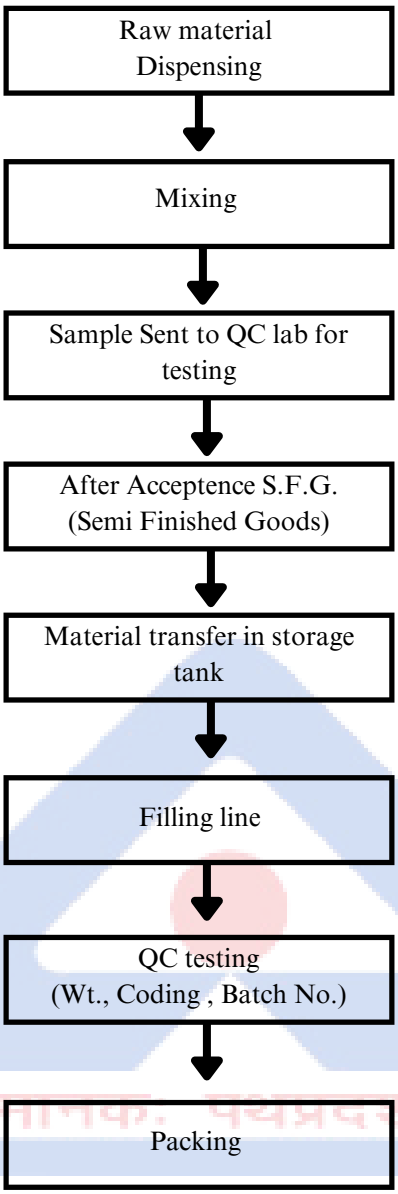
Quality Control Procedures:-

Before the product is released to the market, it undergoes thorough quality control checks. These checks include:

- Verification of weight
- Examination of Coding procedures
- Cross-checking of batch numbers

Only after these quality control measures are successfully completed is the product approved for market distribution.

FLOW CHART MANUFACTURING PROCESS (GEL)



Nip Active Dish Wash Gel

METHODOLOGY

LITERATURE SURVEY AND REVIEW

Identifying Sources:-

The review began by finding credible literature sources, with an emphasis on standards, research papers, and industry reports. I gathered different material using the BIS library, Google Scholar, and industry publications. This technique provided a good foundation for understanding scouring products and their applicable criteria.

Collection of Data:-

I concentrated on gathering data from IS 6047:2009 and international papers such as ASTM D3556-14 and D4009-92. These sources provided insights into worldwide norms and practices. Additional relevant literature were read in order to provide a thorough understanding of scouring products for kitchenware.

Analysis and Synthesis:-

After gathering the appropriate literature, I evaluated the data to discover major points and differences in phrases. Recent changes were noticed, as were gaps in the standards.

CONTACTING COMPANIES, LABORATORIES, AND INDUSTRY ASSOCIATIONS

Initial contact:-

Initial contact with companies, laboratories, and industry associations.I made contact with companies, laboratories, and industry associations via well-written emails. These emails clearly defined the project's purpose and the goals of the industrial visit. This strategy aided in the development of professional relationships and paved the way for meaningful interactions with industry leaders.

Follow-up Communication:-

Following the initial email, I utilized WhatsApp for additional communication to confirm that the emails were received and that responses were timely. This method created a direct communication route and allowed for faster exchanges, increasing the overall efficiency of the engagement process.

Coordination and scheduling:-

Once I received responses, I worked with the companies to organize visits that fit my project timeframe and their availability. Detailed discussions helped to develop the program, ensuring that the visits were focused on specific areas of interest and aligned with study objectives.

Industry Association:-

To deepen my understanding of industry practices, I reached out to key industry associations for insights and data. I created a structured questionnaire tailored to their expertise and sent it to them for detailed feedback. You can find the questionnaire in **Annex A**, which was specifically sent to **ASSOCHAM.**

Documentation:-

Throughout the process, I carefully documented all correspondence, including emails, confirmations, and follow-ups. This record served as a clear reference for future interactions with industry stakeholders, ensuring transparency and responsibility.

ANNEX-A

SCOURING PRODUCTS FOR UTENSILS CLEANING

1.) What are the current trends in the Scouring products for utensils cleaning market?

The current trends in Scouring products are as follows:

1. "Natural" is a big trend nowadays.
2. Many variants like: Neem, Tamarind, Mint, Anti-bacterial Variants are in trend.
3. Newer trend is DIY: Convert Powder to Liquid or Liquid to Liquid and then use as per your convenience.
4. Enzyme-specific Formulations are trending.

2.) Trade data of the surfactant used for scouring products for utensils cleaning?

Trade data for surfactants specifically is approximately: 150-350 crores (Used for scouring products for utensil cleaning).

3.) What are the Trade statistics (Import/Export) of Scouring products for utensils cleaning ?

(You can also attach the pdf of trade data, if any)

90-95% of scouring products for utensil cleaning are made locally.

4.) Leading large scale Manufacturers of Scouring products for utensils cleaning?

1. Unilever
2. Jyothy Labs (Exo)

5.) Leading MSME of Scouring products for utensils cleaning?

6.) Relevant Government schemes and missions?

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

7.) R & D organizations?

1. P&G
2. Unilever,
3. Reliance Consumer Products Ltd.
4. Jyothy Labs
5. Reckitt

GATHERING INSIGHTS ON GIFFY DISHWASH GEL: R&D DATA COLLECTION THROUGH QUESTIONNAIRES AND TELEPHONIC CONVERSATIONS

Wipro Consumer Care & Lighting

In order to get a full understanding of the research and development procedures involved in the formulation of utensil cleaning gels, I conducted a thorough inquiry into the practices of Wipro Consumer Care & Lighting. In order to get a full understanding of the research and development procedures involved in the formulation of utensil cleaning gels, I conducted a thorough inquiry into the practices of **Wipro Consumer Care & Lighting**.

In order to get a full understanding of the research and development procedures involved in the formulation of utensil cleaning gels, I conducted a thorough inquiry into the practices of Wipro Consumer Care & Lighting.This research focuses on their product, **Giffy Dishwash Gel**, and seeks to collect critical information via a precisely constructed questionnaire sent in to **Mr. Vikash Dixit**, the **General Manager of Soap Development** at the Hyderabad facility.

The primary goal of this study is to explore several aspects of the manufacturing procedure, such as raw material selection and criteria, as well as the different types of packaging materials used. Understanding these aspects is critical for providing consumer safety and conformity to national and international standards and certifications.

Furthermore, the inquiry aims to probe into Wipro's automation technologies us ed to improve production efficiency and reduce waste. This entails a thorough study of the conditions of storage, quality assurance settings, and basic testing equipment used in their operations. In addition, the research aims to collect import and export data analysis to present a comprehensive picture of the company market reach and operating strategy.

By gathering this information, we hope to reveal Wipro's techniques for sustaining superior standards and innovation in the dishwashing gel market, thereby providing insights into industry standards of excellence.

All the information received is attached hereafter.

REPORT ON GIFFY DISH WASH LIQUID R&D DATA

1.) Product Information

- **Product Name**: Giffy Dish Wash Liquid
- **Type of Product**: Liquid (Type 2)

2.) Raw Materials

- **Raw Material for Liquid**: DM Water, LABSA, SLES, preservatives, perfume, color, performance chemicals, etc.

3.) Ingredient Selection Criteria

- **Criteria for Ingredient Selection**: Detergency, performance, consistent quality, and supplies.

4.) Quality Control Measures

Quality Control Measures During Production:

- Clean and hygienic environment.
- Calibration of all equipment as per standard intervals.
- Frequent updates of manufacturing personnel on the shop floor.

5.) Consistency in Product Quality

- **Ensuring Consistency in Product Quality:** Standard specifications are followed for all raw materials and finished products.

6.) Packaging Materials

- **Packaging Materials Used:** PET bottle, pouch, cartons, etc.
- **Selection Criteria**: Chosen by product packaging compatibility studies.

7.) Product Safety Assurance

Ensuring Product Safety for Consumer Use:

- Selection of safe ingredients.
- Safety tests of products as per standard protocol at the time of qualification for commercial production.

8.) Environmental Considerations

- **Environmental Considerations During Production:** Cool and ambient temperature, dust and dirt-free environment.

9.) Certifications and Standards

- Certifications or Standards Adhered To: IS 6047: 2009 (Reaffirmed Year: 2021) - Scouring Products for Utensil Cleaning - Specification.

10.) Role of Automation and Technology

- **Role of Automation and Technology in Production**: It helps to minimize human errors in manufacturing.

11. Manufacturing Challenges

- **Typical Challenges Faced in Manufacturing Dishwashing Products:** Maintenance of consistent quality.

12. Production Capacity

- **Production Capacity of Facility:** 20 Tons/Day.

13. Optimization of Production Efficiency

- **Optimization of Production Efficiency and Minimization of Waste:** Standardization from RM stage and standard operating procedures adherence.

14. Innovations and Advancements

- **Recent Innovations or Advancements in Manufacturing Process:** Key ingredients additions automated, reduced manual interventions.

15. Product Shelf-Life and Storage

- **Considerations for Product Shelf-Life and Storage Conditions:** Shelf life is designed based on product physical integrity and product efficacy.

16. Certifications and Quality Control

- **Specific Certifications or Quality Control Measures Implemented:** ISO certifications - IS 9001, ISO 14001, ISO 45001.

17. Lab for Product Testing

- **Name and Address of Lab for Product Testing:** In-house facility.

18. Basic Test Methods

- **Basic Test Methods for Quality and Production Assessment:** Active content, pH, viscosity, foam volume, microbiology.

19. Instruments Used in Manufacturing

- **List of Instruments Used and Their Uses:**
  - Manufacturing Vessel with Stirrer: Equipped with variable frequency.
  - Temperature Probe: For monitoring temperature.
  - Humidity Probe: For measuring humidity levels.
  - pH Meter: For checking pH levels.
  - Viscometer: For measuring viscosity.

20.) Could you also include some photos of the manufacturing plant if possible? If not, can you attach any relevant photos?

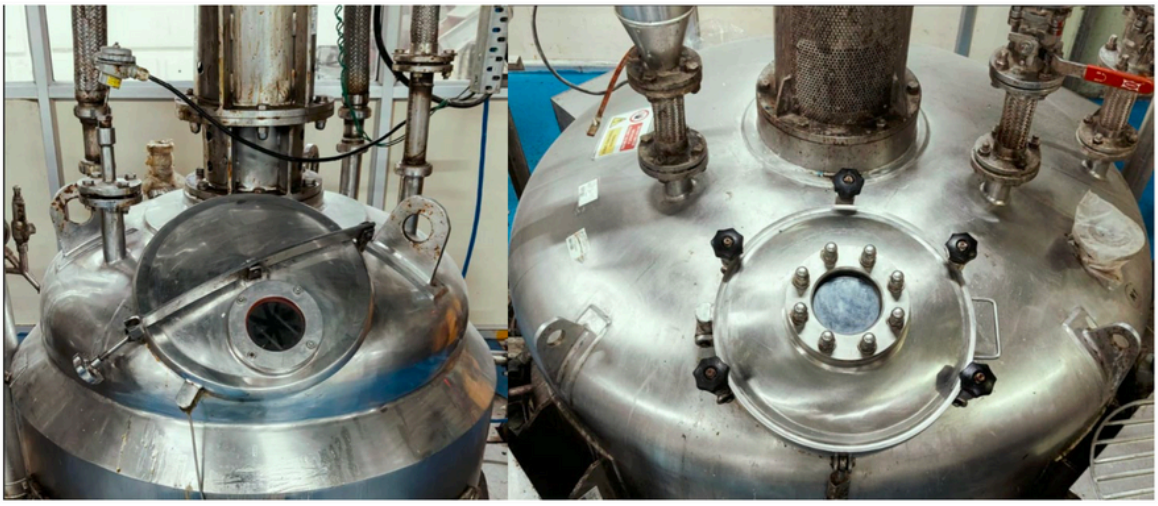


Fig. 0.5

21.) Flow Chart of Liquid Manufacturing

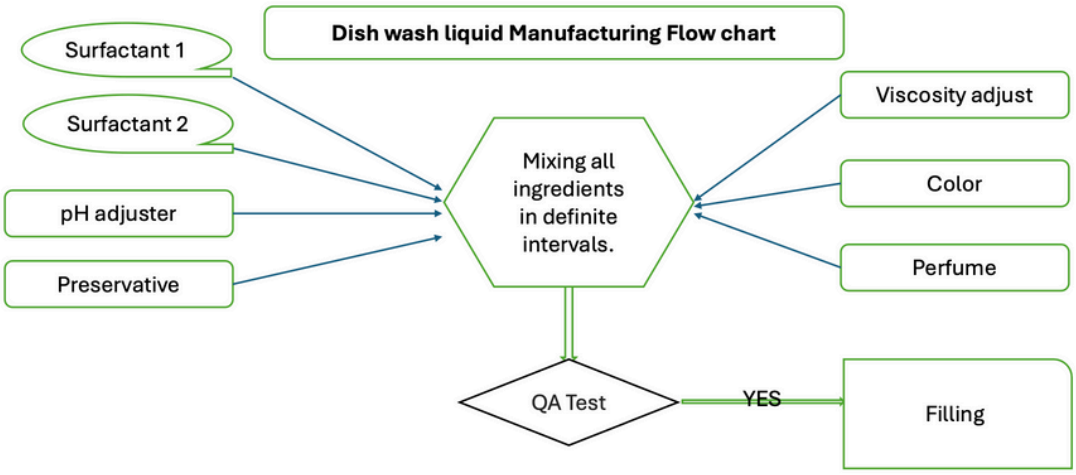


Fig. 0.6

GIFFY DISH WASH LIQUID

Fig. 0.7

GATHERING INSIGHTS ON VIM DISHWASH BAR & GEL: R&D DATA COLLECTION THROUGH QUESTIONNAIRES AND TELEPHONIC CONVERSATIONS

Hindustan Unilever Limited (HUL)

In order to gain a comprehensive understanding of the research and development procedures involved in the formulation of utensil cleaning products, I conducted an in-depth inquiry into the practices of **Hindustan Unilever Limited (HUL)**. This research focuses on their product, **VIM**, which is available in both **Bar and Gel** forms. To gather critical information, a carefully crafted questionnaire was sent to **Ms. Seema Yadav, Assistant Manager** of **Regulatory Affairs at HUL**.

The primary objective of this study is to explore various aspects of the manufacturing process, including the selection and criteria for raw materials, as well as the different types of packaging materials utilized. Understanding these aspects is essential for ensuring consumer safety and compliance with national and international standards and certifications.

Furthermore, the inquiry aims to investigate HUL automation technologies that enhance production efficiency and minimize waste. This includes a detailed examination of storage conditions, quality assurance settings, and the basic testing equipment used in their operations. Additionally, the research seeks to collect import and export data analysis to provide a comprehensive overview of the company's market reach and operational strategy.

By gathering this information, we aim to uncover HUL methods for maintaining superior standards and innovation in the dishwashing product market, thereby offering insights into industry benchmarks of excellence.

All the information received is attached hereafter -

REPORT ON VIM DISH WASH BAR & GEL R&D DATA

1.) Product Name:

- Vim Dish Wash Bar
- Vim Dish Wash Liquid

2.) Type of Product:

- Type 1 (Bar)
- Type 2 (Liquid)

3.) Raw Material for Bar:

- Surfactant: LAS Acid
- Sodium Carbonate
- Sodium Silicate
- Aluminium Sulphate
- Calcite
- Dolomite
- China Clay
- Polymer
- Colour
- Perfume

4.) Raw Material for Liquid:

- Surfactants
- Additional cleaning active technology
- pH adjuster
- Viscosity modifier
- Solvent
- Preservative
- Perfume
- Colour

5.) Main Ingredients for Dishwashing Bar and Gel Products:

- LAS Acid
- Sodium Carbonate
- Sodium Silicate
- Aluminium Sulphate
- Calcite
- Dolomite
- China Clay
- Polymer
- Colour
- Perfume

6.) Criteria for Ingredients Selection:

- Raw Material Purity
- Colour

- Particle size distribution
- Heavy metals Co, Cr, Ni, AS below 5 ppm
- For mineral RMs Crystalline silica below 5% and Asbestos-free

7.) Quality Control Measures During Production:

- Accuracy in Raw material dosing using calibrated load cells to ensure correct quantities
- Sequence of Raw Material addition for batch production

8.) Ensuring Consistency in Product Quality Batch to Batch:

- Logic controls for consistency in operations, including RM dosing and batch making
- Monitoring of fixed parameters at regular intervals

9.) Packaging Materials:

- Polypropylene-based Flexible packaging for Vim Bar
- PET Bottles or pouches for Vim Liquid

10.) Safety Measures for Consumer Use:

- Internal Human Toxicology and Physical Hazards Assessments conducted before market launch

11.) Environmental Considerations During Production:

- Ecological Assessments conducted before market launch

12.) Certifications or Standards:

- No product-specific certifications currently

13.) Role of Automation and Technology in Production:

- Programmable Logic control-based manufacturing system used

14.) Challenges in Manufacturing Dishwashing Products:

- No major challenges faced except mechanical/electrical failures

15.) Production Capacity:

- Vim Bar: Approximately 2000 Tonnes/Month per setup (Cascade)
- Vim Liquid: Approximately 2500 Tonnes/Month per setup

16.) Optimization of Production Efficiency and Waste Minimization:

- Routine maintenance of equipment and strict quality check of input RMs

17.) Recent Innovations or Advancements in Manufacturing Process:

- No recent innovations or advancements

18.) Product Shelf-life and Storage Conditions:

- Product stability analysis conducted before market launch

19.) Certifications or Quality Control Measures:

- No product-specific certification requirement

20.) Lab for Product Testing:

- In-house Lab testing

21.) Basic Test Methods for Quality and Production Assessment:

- Analysis of active levels in Products
- pH
- Moisture (Bar)
- Penetration value (Bar hardness)
- Viscosity (Liquid)
- Micro analysis (Liquid)

22.) Demographic Region for Product:

- All India

23.) Main Equipment Used in Production and Maintenance:

- **For Bar**:

1. Sigma Mixer
2. Multiscrew
3. Duplex Plodder
4. Packing Machines

- **For Gel**:

1. FAS Mixer
2. Ystral Mixer
3. Packing machine

24.) Could you also include some photos of the manufacturing plant if possible? If not, can you attach any relevant photos?

Vim Bar:-

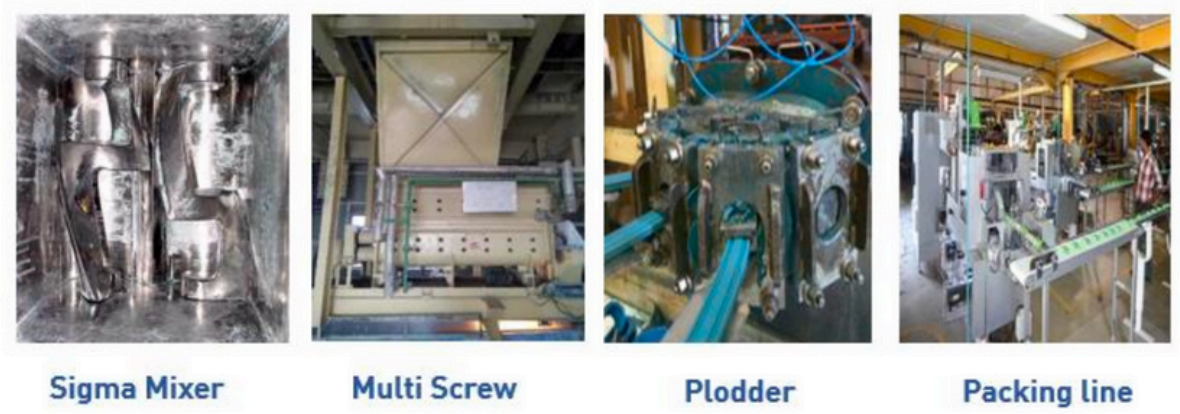


Fig. 0.8

Vim Gel:-

Fig. 0.9

25.) Flow Chart of Bar Manufacturing

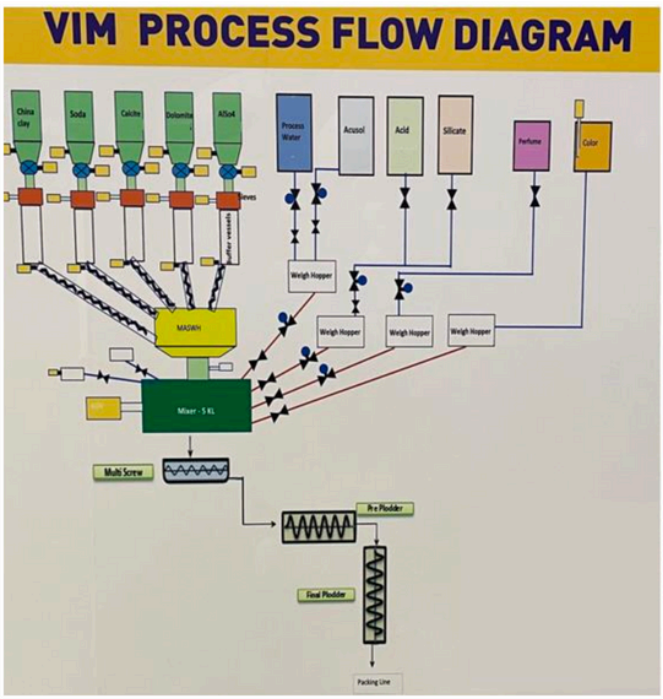


Fig. 1.0

25.) Flow Chart of Gel Manufacturing

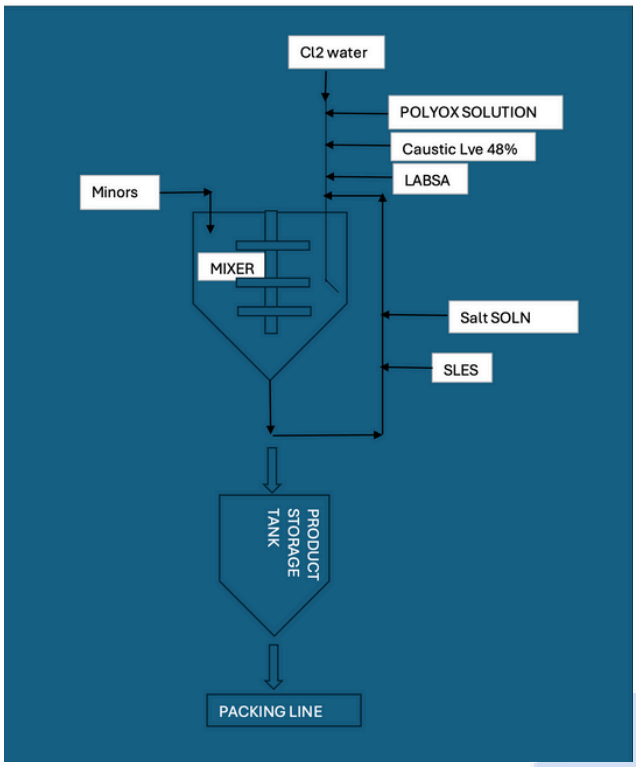


Fig. 1.1

Fig. 1.2

VIM DISH WASH BAR

VIM DISH WASH GEL

Fig. 1.3

Fig. 1.4

The manufacturing units for **VIM Bar** and **VIM Dishwash Gel** are located at the **Pondicherry plant**, while the production of **VIM Bar** is also taking place at the **Sumerpur facility** in Uttar Pradesh. All other relevant information has been gathered and is attached above.

GATHERING INSIGHTS ON SPARKLE DISHWASH BAR & GEL: R&D DATA COLLECTION THROUGH QUESTIONNAIRES AND TELEPHONIC CONVERSATIONS

Shantinath Detergents Private Limited

Sparkle, a leading brand from **Safed**, has become a household name in West Bengal and the Northeast, offering innovative dishwashing solutions including **bars**, tubs, **liquids**, and scrub pads. Known for its effective stain and odor removal, it's rapidly growing across India.

In order to gain a comprehensive understanding of the research and development procedures involved in the formulation of utensil cleaning products, I conducted an in-depth inquiry into the practices of **Shantinath Detergent Pvt. Ltd.** This research focuses on their product, Sparkle, which is available in both bar and gel forms. To gather critical information, a carefully crafted questionnaire was sent to **Mr. Ritum Jain**, **Director** of **Shantinath Detergent Pvt. Ltd.**

The primary objective of this study is to explore various aspects of the manufacturing process, including the selection and criteria for raw materials, as well as the different types of packaging materials utilized. Understanding these aspects is essential for ensuring consumer safety and compliance with national and international standards and certifications.

Furthermore, the inquiry aims to investigate Shantinath's automation technologies that enhance production efficiency and minimize waste. This includes a detailed examination of storage conditions, quality assurance settings, and the basic testing equipment used in their operations. Additionally, the research seeks to collect import and export data analysis to provide a comprehensive overview of the company's market reach and operational strategy.

By gathering this information, we aim to uncover **Shantinath Detergent Pvt. Ltd.** methods for maintaining superior standards and innovation in the dishwashing product market, thereby offering insights into industry benchmarks of excellence.

All the information received is attached hereafter.

1.) Product Name:

- Sparkle

2.) Type of Product:

- Type 1 (Bar)
- Type 2 (Liquid)

3.) Raw Material for Bar:

- Sodium Carbonate
- Labsa
- China Clay
- Pyrophyllite
- Calcite
- Dolomite
- Wax
- Aluminium Sulphate
- Sodium Silicate
- Colour
- Perfume

4.) Flow Chart of Bar Manufacturing:

- Soda Light → China Clay → Pyrophyllite → Labsa with Colour → Neutralization Reaction → Calcite → Dolomite → Aluminium Sulphate → Blend well → Sodium Silicate Liquid → Blending → Wax → Perfume → Blending → Finished Product

5.) Raw Material for Liquid:

- Labsa
- SLES Liquid
- Sodium Hydroxide Flakes
- Citric Acid
- Colour
- Perfume
- DM Water

6.) Flow Chart of Liquid Manufacturing:

- DM Water → Labsa → SLES → Citric Acid → Colour → Perfume → Finished Product

7.) Raw Material for Powder:

- NA

8.) Flow Chart of Powder Manufacturing:

- NA

9.) What are the main ingredients used in your dishwashing bar and gel products?

- Labsa

10. What criteria do you use for ingredients selection?

- Performance
- Cost
- Environmental Safety

11. What quality control measures are in place during the production process?

- **Raw Material Inspection:** Ensuring purity and quality of incoming materials.
- **In-process Testing**: Regular sampling and testing for consistency and active ingredients.
- **Stability Testing**: Perform stability testing to verify the product maintains its efficacy and safety over its shelf life.
- **Performance Testing**: Test the cleaning efficacy of the dishwashing cake and liquid to ensure they meet performance standards.
- **Packaging Integrity**: Inspect packaging for defects to ensure it protects the product from contamination and degradation.

12. How do you ensure consistency in product quality batch to batch?

- **Standard Operating Procedures (SOPs)**: Implement and strictly follow SOPs for every stage of production.
- **Precise Measurements**: Use calibrated equipment to measure raw materials accurately.
- **In-process Monitoring**: Regularly monitor and adjust process parameters (e.g., temperature, mixing time).
- **Batch Documentation**: Maintain detailed records of each batch to trace and replicate successful processes.
- **Quality Testing**: Conduct rigorous testing of raw materials and finished products for key quality attributes.

13. What are the packaging materials used, and how are they chosen?

- **Plastic Bottles**: Chemical resistance, durability, recyclability.
- **Plastic Roll**: Moisture barrier, product protection.
- **Labels**: Water-resistant and durable.

14. How do you ensure the safety of your products for consumer use?

- **Quality Control Testing**: Conduct thorough chemical, and performance tests.

15. What environmental considerations are taken into account during production?

- Sustainable Sourcing: Use eco-friendly and renewable raw materials.
- Waste Management: Implement recycling and waste reduction practices.

16. What certifications or standards do your products adhere to?

Our products adhere to certifications and standards such as:

- ISO 9001: Quality management.
- ISO 14001: Environmental management.
- ISO 45001: Occupational health and safety.
- GMP: Good Manufacturing Practices.

17. Can you explain the role of automation and technology in your production process?

Automation and technology in our production process:

- **Efficiency**: Streamline operations and reduce manual labor.
- **Consistency**: Ensure uniform product quality and minimize human error.
- **Monitoring**: Real-time tracking and control of production parameters.
- **Data Analysis**: Use data for continuous improvement and predictive maintenance.

18. What are the typical challenges faced in manufacturing dishwashing products?

Typical challenges in manufacturing dishwashing products include:

- **Quality Control**: Maintaining consistent product quality.
- **Formulation Stability**: Ensuring long-term stability and effectiveness.
- **Raw Material Variability**: Managing variations in raw material quality.
- **Supply Chain**: Ensuring reliable sourcing and timely delivery of materials.

19. How do you optimize production efficiency and minimize waste?

To optimize production efficiency and minimize waste, we:

- **Lean Manufacturing**: Implement lean practices to streamline processes and reduce waste.
- **Automation**: Use automated systems for precision and efficiency.
- **Real-time Monitoring**: Track production parameters to quickly address issues.
- **Recycling**: Recycle materials and reuse waste wherever possible.
- **Continuous Improvement**: Regularly review and improve processes based on data analysis.

20. What considerations are given to product shelf-life and storage conditions?

Considerations for product shelf-life and storage conditions include:

- **Stability Testing**: Conduct tests to ensure product effectiveness and safety over time.

Packaging: Use materials that protect against moisture, light, and air to extend shelf life.
Storage Conditions: Maintain optimal temperature and humidity levels during storage and distribution.
Expiration Dates: Clearly label expiration dates and provide guidelines for proper storage.

21. Are there any specific certifications or quality control measures implemented?

- Certifications: ISO 9001, ISO 14001, ISO 45001, GMP, Relevant eco-labels.

22. Basic Test Methods for Quality and Production Assessment?

Basic test methods for quality and production assessment include:

- **Physical Tests**: Check for properties like viscosity, density, and pH.
- **Chemical Tests**: Analyze active ingredient concentration and stability.
- **Microbiological Tests**: Assess microbial contamination and efficacy.
- **Performance Tests**: Evaluate cleaning efficiency and product effectiveness.
- **Packaging Tests**: Inspect for integrity, durability, and proper labeling.

23. Mainly, Equipment Used in Production and How to Manage and Maintain It (For Bar)

In a bar setting, managing and maintaining equipment is crucial for smooth operations. Key considerations include:

- **Regular Cleaning**: Ensure equipment like blenders, plodders, and lines are cleaned frequently to prevent build-up and maintain hygiene.
- **Routine Maintenance**: Follow a schedule for servicing and checking equipment to prevent breakdowns.
- **Calibration**: Regularly calibrate equipment.
- **Training**: Train staff on proper use and maintenance to avoid misuse and extend equipment life.
- **Inventory Management**: Keep an inventory of spare parts for quick repairs and replacements.

24. Mainly, Equipment Used in Production and How to Manage and Maintain It (For Gel)

For gel production, key equipment and maintenance considerations include:

- **Mixers and Blenders**: Ensure regular cleaning and calibration to maintain consistency and prevent contamination.
- **Filling Machines**: Perform routine checks and maintenance to ensure accurate and consistent filling.

- **Packaging Equipment:** Regularly clean and service to prevent jams and ensure proper sealing.
- **Storage Tanks:** Monitor and clean to prevent contamination and ensure proper storage conditions.

SPARKLE DISHWASH BAR & GEL

GATHERING INSIGHTS ON PROCLEAN DISHWASH GEL: R&D DATA COLLECTION THROUGH QUESTIONNAIRES AND TELEPHONIC CONVERSATIONS

Godrej Consumer Products Limited

In order to gain a comprehensive understanding of the research and development procedures involved in the formulation of utensil cleaning products, I conducted an in-depth inquiry into the practices of Godrej Consumer Products Limited. This research focuses on their product, **ProClean Utensils Cleaning Gel**. To gather critical information, a carefully crafted questionnaire was sent to **Mr. Manoj Gaur**, **Research Scientist-Regulatory Affairs (R&D)** at **Godrej Consumer Products Limited.**

The primary objective of this study is to explore various aspects of the manufacturing process, including the selection and criteria for raw materials, as well as the different types of packaging materials utilized. Understanding these aspects is essential for ensuring consumer safety and compliance with national and international standards and certifications.

Furthermore, the inquiry aims to investigate Godrej's automation technologies that enhance production efficiency and minimize waste. This includes a detailed examination of storage conditions, quality assurance settings, and the basic testing equipment used in their operations. Additionally, the research seeks to collect import and export data analysis to provide a comprehensive overview of the company's market reach and operational strategy.

By gathering this information, we aim to uncover **Godrej Consumer Products Limited** methods for maintaining superior standards and innovation in the dishwashing product market, thereby offering insights into industry benchmarks of excellence.

All the information received is attached hereafter.

1. Product Information

- **Product Name**: ProClean Dishwashing Liquid
- **Type of Product**: Type 2 (Liquid)

2. Raw Materials for Liquid

- **Surfactants**: LABSA, Sodium Lauryl Sulfate (SLS), Sodium Laureth Sulfate (SLES)
- **Builders**: Zeolites, Citric Acid
- **pH Adjusters**: Citric Acid, Sodium Hydroxide
- **Preservatives**: Phenoxyethanol
- **Thickeners**: Xanthan Gum, Hydroxyethyl Cellulose, Electrolyte
- **Fragrances and Colorants**: Used for sensory enhancement

3. Criteria for Ingredient Selection

- **Effectiveness**
- **Cleaning Power**: The primary purpose of dishwashing liquid is to clean grease and food residues effectively. Ingredients such as surfactants must have strong grease-cutting capabilities.
- **Foaming**: The ability of the product to generate foam can impact user perception of cleaning efficacy. Ingredients should produce sufficient and stable foam.
- **Risibility**: Ingredients should ensure that the product rinses off easily, leaving no residue on dishes.

Apart from effectiveness Safety, Regulation requirement, Aesthetic, Stability, Costing & Sustainability is also important for selection of ingredients.

4. Quality Control Measures in Production

Monitored Parameters:

- % Active Detergent
- % LOD
- pH
- Viscosity
- Appearance
- Specific Gravity

5. How do you ensure consistency in product quality batch to batch ?

- Viscometer. (We also measure by B4 cup & Rheometer)

6. Packaging Materials and Selection Criteria

- Materials Used: 1.) Plastic Bottles
  2.) Multi-layer Pouches

- **Types of Plastic:**
- **Polyethylene Terephthalate (PET)**: Lightweight, shatter-resistant, and recyclable. Commonly used for clear or colored bottles.
- **High-Density Polyethylene (HDPE)**: Durable and resistant to impact, often used for opaque bottles.
- **Selection Criteria**:
- Product Protection
- Barrier Properties
- Consumer Convenience
- Ease of Use
- Production Costs
- Transportation Costs
- Environmental Impact
- Recyclability
- Sustainability
- Regulatory Compliance
- Safety Standards
- Labeling Requirements
- Aesthetics and Branding
- Visual Appeal

7. Safety Assurance for Consumer Use

- **Test Method**: Hand Immersion Study as per BIS 11601:2002

8. Environmental Considerations in Production

- **Energy Efficiency:** Implement energy-efficient practices and technologies to reduce the energy consumption of the production process. This includes optimizing heating, cooling, and mixing processes.
- **Water Usage:** Minimize water use in the manufacturing process and treat wastewater (water use in changeover process Cleaning and sanitization process) effectively to prevent contamination of local water sources.
- **Waste Management**: Reduce, reuse, and recycle waste generated during production. Properly manage and dispose of any hazardous waste materials according to regulations.

9. Certifications and Standards Adherence

- **Standards Followed**: There is no BIS specification for liquid dishwash, but we are following IS 6047:2009 to check the efficacy of the product.

10. Automation and Technology in Production

- **Automation Involved**: Corrosive ingredient handling and mixing or neutralizing by using of automated dispenser by using load cell. Also, use flow meter for water addition in mixer.

11. Challenges in Manufacturing

- **Raw Material Variability**: Variation of the incoming raw material will impact the process variation. E.g.- Acidity of LABSA will keep changing, so the requirement of caustic will also keep changing.
- **Aesthetic Matching:** Matching other aesthetic parameters like viscosity, rheology, etc.

12. Production Capacity

- **Batch Size:** 12.5 MT
- **Frequency:** Tentative requirement is 1 batch per week

13. Optimization of Production Efficiency and Waste Minimization ?

- Process Optimization / Process Automation.
- Efficient Resource Management: Material Efficiency, Energy Efficiency, Water Conservation.
- Waste Minimization.
- Continuous Improvement.
- Equipment Maintenance.
- Employee Training and Engagement.
- New Technology Adoption.

14. Innovations in Manufacturing ?

- **Focus**: We are more focused on the selection of sustainable/greener ingredients in further development of dishwash.

15. Considerations for Product Shelf-Life and Storage Conditions ?

- Formulation Stability
- Packaging Material Compatibility

16. Lab for Product Testing

- **Lab Name**: GeoChel Lab
- **Location**: Kanjurmar, Mumbai

17. Basic Test Methods for Quality and Production Assessment

- Testing Standards: Testing methods mentioned in IS 6047 & Performance as per IS 4955.

18. Specific Demographic Region for Product Distribution

Target Regions:

- **Metropolitan Cities**: Mumbai, Delhi, Kolkata, Chennai
- **Tier 1 Cities**: Pune, Ahmedabad
- **Tier 2 Cities**: Chandigarh, Jaipur

18. Main Equipment Used in Gel Dish Wash Production

- **Mixing Equipment:**
- **Ribbon Blenders**: Useful for blending powders and granules.
- **High-Shear Mixers**: Ideal for creating emulsions and suspensions with high viscosity.
- **Planetary Mixers**: Used for high-viscosity gels and pastes.
- **Heating and Cooling Systems**
- **Storage Tanks**
- **Transfer Pumps**
- **Filling and Packaging Equipment**

19. Can you provide a list of instruments used in manufacturing and describe the uses of each instrument in the process, step by step?

1. **Weighing Scales**
2. **Mixing and Formulation Equipment:**

- Ribbon Blenders
- High-Shear Mixers
- Planetary Mixers
- Heating or Cooling Jackets

3. **Quality Control Equipment:**

- Viscometers
- pH Meters
- Spectrophotometers
- Microbiological Testing Equipment

4. **Filling and Packaging Equipment:**

- Volumetric Fillers: Dispense a specific volume of liquid.
- Piston Fillers: Use pistons to measure and dispense the liquid.
- Servo-Driven Fillers: Offer precise control over filling volumes and speeds.

5. **Capping Machines**
6. **Labeling Machines**

20. International Standards Followed

Standard: ASTM D3556

21. Challenges in Balancing Manufacturing Considerations

- **Focus Areas:** Balancing between sustainable ingredients vs. cost vs. consumer choice.

REVIEW AND AMENDMENTS TO FOR IS 6047:2009

IS No.	*Title*
286 : 1978	Methods of sampling and test for soaps (*second revision*)
1070 : 1992	Reagent grade water — Specification (*third revision*)
4707 (Part 1) : 2001	Classification of cosmetics raw materials and adjuncts: Part 1 Dyes, colours and pigments (*second revision*)
4955 : 2001	Household laundry detergent powders – Specification (*fourth revision*)
5522 : 1992	Stainless steel sheets and strips for utensils – Specification (*second revision*)

Fig. 0.1

6 SAMPLING

6.1 Representative samples of the material shall be drawn as prescribed under 3 of IS 286.

Fig. 0.2

6.2 Test for checking the requirement for surface active ingredient of the material shall be conducted on individual samples and the rest of the tests shall

Table 1 Requirements for Scouring Products for Utensil Cleaning
(*Clause* 4.2)

Sl No.	Characteristic	Requirement				Method of Test, Ref to	
		Type 1 Bar	Type 2 Liquid	Type 3 Paste	Type 4 Powder	Annex	Clause No. in IS 286
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
i)	Retention on 250-micron IS sieve, *Max*	0.1	—	0.1	0.1	B	—
ii)	Active matter, percent by weight, *Min*	8	12	12	2	C	—
iii)	Active (Reserve) alkalinity, in ml, *Max*	20	20	20	20	D	—
iv)	Matter insoluble in alcobol, percent by weight	80 (*Max*)	—	75 (*Max*)	80 (*Max*)	—	5
v)	Moisture and volatile matter content at 105°C, percent by weight, *Max*	10	—	—	3	—	4 (Oven Method)
vi)	Lather, in ml, *Min*	70	70	70	10	E	—
vii)	Cleaning efficacy, number of plates cleaned per 5 g of sample, *Min*	5	4	5	2	F	—
viii)	Tough soil cleaning in percentage, *Min*	20	5	20	30	G	—
ix)	Surface damage, *Max*	2	1	2	3	H	—

Fig. 0.3

DETERMINATION OF ACTIVE MATTER

C-1 OUTLINE OF THE METHOD

First, it is determined whether the active cleansing ingredient is soap or synthetic detergent, and then the determination is made by the procedure, which is applicable depending on the type of the ingredient.

C-2 PROCEDURE

C-2.1 Weigh accurately about 5 g of the material and transfer it to a 150-ml beaker. Add about 50 ml of freshly boiled and cooled distilled water (*see* IS 1070) to the beaker and put the beaker on a hot plate for dissolving the material soluble in water. Continue stirring with a glass rod to ensure dissolution. Filter through a filter paper into a 100-ml flask. Wash the filter paper with hot water at least four times collecting the washings into the filtrate. Now cool the solution under a water tap and then add distilled water up to the 100-ml mark.

C-2.2 Take about 10 ml of the above solution and add 3 ml of 3 (N) solution of hydrochloric acid. Fatty acids separate if the sample of scouring product is based on soap.

C-2.3 If the soap is found absent by the test given in **C-2.2**, take a fresh 10 ml solution (*see* **C-2.1**) in a test tube and test for the presence of anionic synthetic detergent as prescribed in **B-2** of IS 4955.

C-2.4 Determine the total fatty matter content of the material by the procedure prescribed in **15** of IS 286, in case the scouring product is based on soaps.

C-2.5 Determine the surface active ingredient content of the material by the procedure prescribed in **B-5** of IS 4955, in case the scouring product is based on synthetic detergents.

Fig. 0.4

1.) Below is the description of the Indian standards that have been updated, as mentioned **In Figure 0.1** above:

Previous: IS 286: 1978 - Methods of Sampling and Test for Soaps (Second Revision)
Updated: IS 286: 2018 - Methods of Sampling and Test for Soaps (Third Revision)

Previous: IS 1070: 1992 - Reagent Grade Water — Specification (Third Revision)
Updated: IS 1070: 2023 - Reagent Grade Water — Specification (Fourth Revision)

Previous: IS 4707 (Part 1): 2001 - Classification for Cosmetic Raw Materials and Adjuncts Part 1 Dyes, colours and pigments (second revision)
Updated: IS 4707 (Part 1): 2020 - Classification for Cosmetic Raw Materials and Adjuncts Part 1 Colourants (Fourth Revision)

Previous: IS 4955: 2001 - Household Laundry Detergent Powders — Specification (Fourth Revision)
Updated: IS 4955: 2020 - Household Laundry Detergent Powders — Specification (Fifth Revision)

Previous: IS 5522: 1992 - Stainless Steel Sheets and Strips for Utensils — Specification (Second Revision)
Updated: IS 5522: 2014 - Stainless Steel Sheets and Strips for Utensils — Specification (Third Revision)

2.) In Figure 0.2 above:

6.1 Representative samples of the material shall be drawn as prescribed under 4 of IS 286.

3.) In Figure 0.3 above:

1.) According to the industry expert, sieving of bar scouring products is not necessary. It is only sufficient for gel, powder, and paste forms. This data was provided by Fena Pvt. Limited. However, no response has been received from other industries on this matter.

2.) There are currently no manufacturers of utensil cleaning paste available at the national level in India; it seems to be available only from abroad as a ready-made product.

3.) Clause Numbers in IS 286:
iv. Matter insoluble in alcohol, percent by weight: This is specified under (6).
v. Moisture and volatile matter content at 105°C, percent by weight: This is specified under (5.2) for the oven method.

2.) In Figure 0.4 above:

C-2.4 Determine the total fatty matter content of the material by the procedure prescribed in 16 of lS 286, in case the scouring product is based on soaps.

PROPOSED INCLUSION OF ADDITIONAL TESTING METHODS FROM EAS 296:2011 INTO IS 6047:2009 IN AMENDMENTS

EAS 296:2011 standard, specifically **Annex E**, which outlines the procedure for **DETERMINING INORGANIC SALTS IN A SAMPLE:-**

Key Points:

E.1 Procedure:

- The sample material is heated at 450°C in a muffle furnace to destroy organic matter.
- After cooling, concentrated sulfuric acid is added, and the sample is reheated to dryness.
- This heating, cooling, and weighing process is repeated until a constant mass is obtained.

E.2 Calculation:

- The inorganic salts content is calculated using the formula:
  Inorganic Salts Content (%) = (M3 - M1)/(M1 - M0) ×100

Where:-

M0 is the mass of the dish alone.
M1 is the mass of the dish and the sample before heating.
M3 is the mass of the dish with the residue after the heating process.

This method is used to determine the percentage of inorganic salts by mass in a sample by eliminating organic material and measuring the remaining residue after treatment.

Annex B, which outlines the procedure for
MEASURING pH VALUE:-

To measure the pH of your sample, follow these simple steps:

1. **Prepare the Sample:** Take 1.0 ml of your test sample.
2. **Dilute**: Mix this sample into 100 ml of distilled or de-ionized water that's free of carbon dioxide. This helps to avoid any interference and gives you a clearer pH reading.
3. **Measure**: Use a pH meter with a glass electrode, making sure it's accurate to 0.1 or better. Measure the pH of your solution at room temperature.
4. **Calibrate First**: Before taking your measurement, calibrate the pH meter with standard buffer solutions. This ensures your readings are precise.

5. **Record the Reading**: Once the pH meter gives a stable reading, jot it down. This provides an accurate pH value for your sample.

In an industrial context, measuring the pH of products is crucial for ensuring they meet quality and safety standards. By following these steps, you can accurately assess the pH levels of various products, helping maintain consistency and compliance across the industry.

Reference :-

https://law.resource.org/pub/eac/ibr/eas.296.2011.pdf

OTHER RELEVANT NATIONAL AND INTERNATIONAL STANDARD ON PRODUCTS AND TEST METHODS

- IS 286: 2018 - Methods of Sampling and Test for Soaps (Third Revision)
- IS 1070: 2023 - Reagent Grade Water — Specification (Fourth Revision)
- IS 4707 (Part 1): 2020 - Classification for Cosmetic Raw Materials and Adjuncts Part 1 Colourants (Fourth Revision)
- IS 4955: 2020 - Household Laundry Detergent Powders — Specification (Fifth Revision)
- IS 5522: 2014 - Stainless Steel Sheets and Strips for Utensils — Specification (Third Revision)
- ISO 19867-1 - Clean cookstoves and clean cooking solutions Harmonized laboratory test protocols Part 1: Standard test sequence for emissions and performance, safety and durability.
- ISO/TR 19867-3 - Clean cookstoves and clean cooking solutions - Harmonized laboratory test protocols Part 3: Voluntary performance targets for cookstoves based on laboratory testing
- EAS 296 (2011) (English): Liquid household hand dishwashing detergent - Specification
- ASTM D4009 − 92 (Reapproved 2011) Standard Guide for Foam Stability of Hand Dishwashing Detergents
- ASTM D3556 − 14 Standard Guide for Deposition on Glassware During Mechanical Dishwashing
- NPFC - P-S-571 SOAP, SCOURING (CAKE FORM) AND SOAP, SCRUBBING, ALKALINE (POWDER FORM)
- NPFC - P-S-320 SCOURING POWDER , GLASS CLEANER

GENERAL QUALITIES FOR BARS

MARKING:

Each packet shall contain the following information:
a) Name of material and type
b) Weight of the material in the package (when packed)
c) Name of manufacturer and trademark, if any
d) Batch number
e) Month and year of manufacture
f) Directions and instructions for usage
g) MRP
h) Customer-care details

- None of the tested brands provided directions and instructions for usage although the national standard requires the same on the packet.
- Batch number was not marked in Nip, Reliance Scrubz and Xpert.

PACKAGING:

The utensil bar should be securely packed in plastic wrappers, paperboard containers, or cartons as appropriate to the product form, or adequately sealed to retain the essential moisture contained in the utensil bar. Ideally, packaging should also be recyclable or biodegradable.

• All the brands had moisture-proof flexible packaging.

NET WEIGHT:

The net weight for all the brands was measured and compared with the respective declared values. The maximum permissible error, as per Legal Metrology Rules, is 9 gm for products weighing between 200 gm and 300 gm; for products weighing between 300 gm and 500 gm, the maximum permissible error is 12 gm.

- The net weight of Clean Mate, Vim, Pril and Reliance Scrubz was as per their claim.
- Net weight of Patanjali, Nip, Odopic, Xpert and Pitambari was found to be less than their claim but was within the specified tolerance limit.
- Net weight of Exo was found to be less than the tolerance limit.

The packaging and marking of utensil cleaning bars generally meet regulatory standards, though some brands lacked usage instructions and batch numbers. While most brands adhered to the net weight specifications within permissible limits, Exo fell short of the tolerance limit. This data is sourced from the website consumeraffairs.nic.in.

Reference :-

https://consumeraffairs.nic.in/sites/default/files/file-uploads/ctocpas/Utensil-Cleaning%20Bars.pdf

AUTOMATIC DISHWASH DETERGENTS

Dishwashing detergents need to efficiently remove the toughest stains, whilst protecting dishes. By using our environmentally friendly ingredients you can sustainably develop high performance formulations. Our range of rheology modifiers offers endless design and format possibilities.

The effect of chemicals on the skin is less of a concern in automatic dishwash, but their effect on the environment can be a real issue. With the move towards life cycle analysis, our range of bio-based ingredients can help contribute to improved machine efficiency, resulting in lower energy usage.

Automatic Dishwasher Detergents - In addition to remove food soils and hold them in suspension, automatic dishwashing detergents tie up hardness minerals, emulsify oil and grease, suppress foam caused by protein soil and help water sheet off the dish surfaces. These types of detergents produce very little or almost zero suds, which could interfere with the cleaning action of machine.

Besides the dishwash cleaning detergents, a variety of specialty products are also available that can be used to attain effective cleaning and optimum performance. The specialty dishwash cleaning products include -

Rinse Agents - Rinse agents are specialty products that can be used along with automatic dishwashing detergent to reduce the surface tension. This product helps in improving the draining of water from dishes and utensils, thereby

delivering superior performance. Better draining results in minimum spotting and filming and thus improves drying.

Film Removers - Film removers are specialty chemicals, which help in removing the build-up of hard water film and cloudiness from the dishes and the interior of dishwasher. Film removers can be used instead of an automatic dishwashing detergent in a separate cycle or together with the detergent.

Lime & Rust Removers - Lime and rust removers are effective cleansers in removing the deposits of lime and / or rust from the interior of dishwasher. These products are used when no dishes or other dishwashing products are present.

Dishwashing Cleaning Powder - Dishwash cleaning powders are free-flowing granules that most people considers as the traditional automatic dishwashing detergent form. Suitable for all types of dishwashers, dishwash-cleaning powders ensure streak-free results and rapid drying.

Dishwashing Cleaning Liquid - Also known as washing soap or washing-up liquid, dishwash cleaning liquids, are used for hand washing of glasses, plate, cutlery and cooking utensils in a sink or bowl. These cleaning liquids are usually a mixture of high foaming surfactants.

Dishwashing Cleaning Tablets - Dishwashing cleaning tablets are formulated for effective cleaning and convenience. As they are pre-measured, there is no need of measuring and no chances of waste or mess. Each tablet contains the exact dose for a complete load and is individually wrapped so as to protect from moisture and humidity. Although the dishwash cleaning tablets are designed to work well in all types of water, the users may need to add an extra tablet for usage in extremely hard water.

Dishwash Cleaning Gel - Gels are designed to ensure controlled dispensing. Due to their form, these are less likely to be spilled than powders and dissolve quickly thereby allowing the detergent to begin working right away.
Detergent Concentrate - These are liquid cleansers for cleaning dishes, plastics and many other surfaces.

These different types of dishwash cleaning products are suitable for usage and applications in different operating conditions and the selection of a particular type depends on the application and choice.

AUTOMATIC DISHWASHER DETERGENT COMPOSITION

Abstract:-

Detergent compositions suitable for use in automatic dishwashing machines are disclosed. The compositions contain detergency builder materials, a chlorine bleach component, an optional low-foaming, bleach-stable surfactant and a relatively water-soluble stilbene dye which is color-stable with respect to said chloride bleach component and which does not stain dishes etc.

PATENT NO:- US4714562A

Reference:-

Automatic dishwasher detergent composition

Detergent compositions suitable for use in automatic dishwashing machines are disclosed.

google.com / Mar 6, 1987

OTHER RELEVANT REFERENCE

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https://consumeraffairs.nic.in/sites/default/files/file-uploads/ctocpas/Utensil-Cleaning%20Bars.pdf

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