PRODUCT STEWARDSHIP SUMMARY

[Refer to the material Safety Data Sheet (MSDS) for additional Information and before handling this material.]

STABLE BLEACHING POWDER

PRODUCT OVERVIEW

Stable Bleaching Powder (Calcium Hypochlorite) is a widely used chemical. It decomposes on contact with water, releasing chlorine at the point of application. This makes it a strong oxidizing and bleaching agent.

Production

Bleaching powder also known as chlorinated lime is a yellowish-white powder easily soluble in water. The chlorine content of bleaching powder varies from 35−36%. If temperature of lime kept between 30°C−40°C bleaching powder with available chlorine up to 36% is obtained. It is not hygroscopic, if kept under 40°C. It is mainly used as a bleaching agent and as a disinfectant. The major use of bleaching powder is in paper industry, textile industry, oil industry, It is used as disinfectant and germicide in the sterilization of drinking water, manufacturing of chloroform, making wool unshirnkable, oxidizing agent in industry mainly as bleaching agent for cotton, linen and wood pulp, as bathroom cleaner, cleaning of old and second hand items, as household disinfectant spray, to preserve cut flower fresh and for plastic furniture etc.. It is also used in all chemical industry where bleaching is required. Our Company is producing chlorine in its Chlor-alkali plant since 1965. To utilize chlorine and to reduce chlorine stock in the plant as a safety measure, Industry is proposing to set up a new facility viz., stable bleaching powder plant of 12,500 tons per year capacity, which will utilize around 15 tons per day of chlorine.

RAW MATERIAL USED:

Hydrated Lime @ 90% Pure

Liquid Chlorine @ 99.5% Pure

The two main raw materials required for the manufacture of bleaching powder are high grade lime and chlorine. Chlorine is available as a byproduct during the electrolysis of brine. When lime is processed with chlorine it has to be 99.5% pure. The lime quality used is utmost importance. Generally lime which has a $Ca(OH)_2$ content of around 92 %.It should contain less than 2% of carbonate, 0.5% of iron oxide and no cobalt or manganese. The lime after slaking should be stored for some time before use and its moisture content may be 4%.

PROCESS AND TECHNOLOGY:

There are two main processes for producing bleaching powder-these are Krebbs Beckman Towers Process and Hasen Clever Process. In the Hasen Clever Process, there are cast iron cylinders operating

in series with hydrated lime and chlorine being fed counter current to each other. The cylinders are provided with rotating blades and are arranged horizontally one above the other. The blades act both as mixers and conveyors of the inside mass. Hydrated lime is charged at one end of the top most cylinders while chlorine is introduced at the other end of the bottom cylinder. With the rotation of the blades there is a through mixing of the chlorine and lime. The chlorinated lime is discharged from the bottom cylinder and the un-reacted chlorine is recovered from the top cylinder and recycled along with fresh chlorine. Machinery needed for the plant include cast iron cylinders, feed hopper, chlorine cylinders, lime storage tanks, piping instrumentation accessories, laboratory equipment. The main reaction is as follows-

$$Ca(OH)_2 + Cl_2 \rightarrow CaOCl_2 + H_2O$$

Process description:

The manufacturing of Stable Bleaching Powder consists of following steps
- Charging
- Chlorination
- Drying
- Cooling
- Discharge
- Clarification and cooling
- Dust control system

PACKAGING

In bags with double inner liner (25Kg HDPE bags)
In Drums with single inner liner (50Kg GI Drum / 50Kg HDPE Drum / 25Kg HDPE Drum) or as per pack size required by the buyer)

USES

Bleaching powder is basically a bleaching agent. It finds application as a bleaching agent in Textile Mills, Hand Looms and Power Looms, Hosiery, Laundry, Paper, Soap and Silicate manufacturing and as oxidizing agent in organic synthesis. It is not for Medicinal
Use.

QUALITY OF PRODUCT:

Stable bleaching powder activity is measured in terms of available chlorine. The bleaching powder ($CaOCl_2$) contains about 35% available chlorine. Normally there are two grade of bleaching powder.

Grade 1 – Containing 34% to 35% chlorine content

Grade 2 – Containing 32% to 33% chlorine content

The percentage of chlorine content in SBP usually depends on the percent of available calcium hydroxide in hydrated lime.

Specifications	Grade I	Grade II
Available Chlorine (min.)	34%	32%
Parts Stability (max.)	1/15	1/11
Moisture (%) (max.)	0.30	0.50
Particles passing through 1:7 mm (10 mesh) IS Sieve (min.)	99.5%	99.0%

Properties	
Appearance	White, Fine free flowing Powder
Specific Gravity	2.35 at 200°C
Physical state	Solid
Solubility in water	Mixes in water
Odour	Pungent
Toxicity	
LD_{50}(Oral-Rat)	850 mg/kg
TLV / MAC(ACGIH)	3mg/M^3 for Chlorine
It causes irritation of eyes, skin, throat and respiratory tract.	

SAFE HANDLING AND STORAGE

Contamination or improper use may cause the release of toxic gases. Do not allow Calcium Hypochlorite to contact any acidic material, including other water treatment products. This product must be stored in a cool, well ventilated area. Calcium Hypochlorite is a strong oxidizing agent.

INDUSTRIAL HEALTH AND SAFETY

Water Jacket is provided for cooling the drum to control temperature. Temperature sensor with alarm will be provided to control temperature for process safety. All required PPE's (Helmet, gumboot, goggles, hand gloves, dust mask etc.) will be provided to the workmen engaged in the operation and maintenance of SBP plant. Two nos chlorine gas sensors will be provided with alarms set at 1 ppm, to check instantly any leak or smell beyond 1ppm.

SAFETY / PRECAUTION:

Keep away from water, acid, combustible materials and heat. Drums can rupture when heated.

STORAGE:

Store in a cool, dry, well ventilated area, away from the source of heat, direct sunlight. Avoid extended storage during summer.

FIRST AID MEASURES

Eyes : Flush eyes with a stream of water for atleast 15 minutes

Skin : Flush thoroughly with cool water under shower while removing contaminated clothing and shoes. Discard non rubber shoes

Inhalation : Remove to fresh air

Ingestion : If swallowed, do not induce vomiting, although it may occur spontaneously.

SPILLAGE/ACCIDENTAL RELEASE

Spillage : Do not touch spilled material. Prevent it entering sewers. Dry manual lifting of the spilled material is suggested.

Personal Precautions : Avoid generation of dust. Avoid Eyes & Skin Contact. Avoid Inhalation. Avoid Ingestion. Wear appropriate personal protective equipments.

Environmental Precautions Prevent contamination of soil and water. Prevent from spreading or entering into sewers or confined spaces.

PHYSICAL AND CHEMICAL PROPERTIES

Properties of Stable bleaching powder	
Appearance	White, Fine free flowing Powder
Specific Gravity	2.35 at 200°C
Physical state	Solid
Solubility in water	Mixes in water
Odour	Pungent

Chemical Identity	
Formula: Ca (OCl)2	CAS No.7778-54-3
Molecular Weight	143
UN No.	1748

REGULATORY INFORMATION

The stable bleaching powder Material Safety Data Sheet contains regulatory information.

PRODUCT STEWARDSHIP

OPM-CSU is committed to managing s t a b l e b l e a c h i n g p o w d e r so that it can be safely used by its employees and customers. OPM-CSU's relationships with its customers encourage communication about safety and environmental stewardship.

Transport information

BIS No. CM/L : 8200115503

UN No. 75565

Stable bleaching powder is packed in 25 kg HDPE bags with double liner and 50Kg HDPE drum with liner and transported

only through trucks.

Labelling

Every vehicle used for transporting stable bleaching powder shall be legibly and conspicuously marked with an emergency information panel as per the requirement of Central Motor Vehicles Act, 1989.

Safety during Transportation

1. Do not smoke in the SBP loaded truck.
2. All sources of ignition must be kept away from the truck during transportation,
3. Driver should follow specified route only, maintain speed limit, never park the truck near residential areas, drive truck carefully and observe all routes and signals. Avoid overtaking of moving vehicles and do not leave truck without watch at any time.
4. SBP should be kept away from heat and moisture.
5. No inflammable material like oil, paint, varnish, grease, etc, should be clubbed with SBP, which may react with SBP and catch fire.
6. Loaded SBP should be well covered with tarpaulin,
7. No part of SBP bag or drum should come outside from the base of the truck, which can rub with the tyre/any moving part and catch fire.
8. Do not use hooks for loading or unloading.
9. In case of emergency (for example, fire, accidents, etc) follow the instructions mentioned in the instruction manual to control and mitigate an emergency:
   Stop the engine; Notify police and fire brigade immediately; Mark roads; warn other road users; Keep public away;
   In case of fire, move the truck immediately to an open area and flush with excess water; and immediately contact manufacturer/supplier.

ADDITIONAL INFORMATION

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process unless specified in the text.

The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release, and neither it is to be considered a warranty or quality specification, nor as a binding statement on contractually agreed product qualities. C.K. Birla Chemicals (India) Ltd does not take any guarantee or legal liability expressed or implied under any circumstances in respect of the adequacy of this document for any particular purpose

NOTICE

Prior to its use, the user is responsible for determining the suitability of the product or products covered by this Product Stewardship Summary and for complying with state, local laws and regulations in connection with its use. Neither OPM-CSU nor any of its affiliates shall be responsible for any damages of any kind

whatsoever resulting from the use of or reliance on this Product Stewardship Summary or product or products to which it refers.

This Product Stewardship Summary is intended only to provide a general summary of the potential hazards associated with the product or products described herein. It is not intended to provide detailed information about potential health effects and safe use and handling information and, although OPM-CSU believes this information is correct, OPM-CSU makes no warranties as to its completeness or accuracy. Appropriate literature has been assembled which provides information concerning the health and safety precautions that must be observed when handling the OPM-CSU product(s) mentioned in this document. Before working with any of these products, users must read and become familiar with the available information on product hazards, proper use, and handling. Information is available in several forms, such as Material safety data sheets (MSDS) and product labels. A copy of OPM-CSU's MSDS for Calcium Hypochlorite can be obtained by the company. This information is subject to change without notice.

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