BRIMSTECH
CORPORATION

Sulphur Solidification,
Forming,
Handling and
Storage Technology

BRIMSTECH

www.brimstech.com

THE COMPANY

BRIMSTECH CORPORATION is a new established company providing solutions for sulphur solidification industry. Solidification and forming (granulation & pastillation) and also fertilizer unit design is our proficiency. BRIMSTECH CORPORATION is a new name that taken possession of a fifteen years experience by performing over 10 major projects having strong background in this industry. These experiences which include all required activities for a project like Management, Engineering, Procurement, Manufacturing, Installation, Pre-commissioning and Commissioning of SSUs used to present to clients through a familiar name, ZAFARAN Company and now BRIMSTECH CORPORATION is continuing this route from now on by owning all intellectual properties and key personnels and management of ZAFARAN.

Brimstech Corporation as a Canadian company and also it's predecessor company, Zafaran, are specialist in sulphur solidification and forming (granulation & pastillation), sulphur fertilizer units as well as handling and storage unit of oil and gas refinery. They have a broad experience to supply complete sulphur forming packages for oil and gas refineries and petrochemical plants.

BRIMSTECH

Some EP and turnkey sulphur solidification, handling and storage projects have been already done. Installed equipment for different sulphur forming units within last 6 years is capable to produce more than 10,000 tons per day solid sulphur based on SUDIC standard with safe, reliable, flexible and efficient services.

SULPHUR SOLIDIFICATION

Sulphur Solidification

Sulphur is extracted as H_2S gas along with crude oil and gas from underground reserves, and is produced as a by product in hydrocarbon refineries.
Increased extraction of oil and gas and new efforts to decrease the occurrence of acid rain by separating sulphur from fossil fuels have resulted in an increase in sulphur production around the world.
As sulphur is produced in larger quantities, storage and handling costs can oftentimes exceed the actual value of the product itself. It's no surprise that sulphur producers are always looking for better and more efficient methods to store and transport this product.

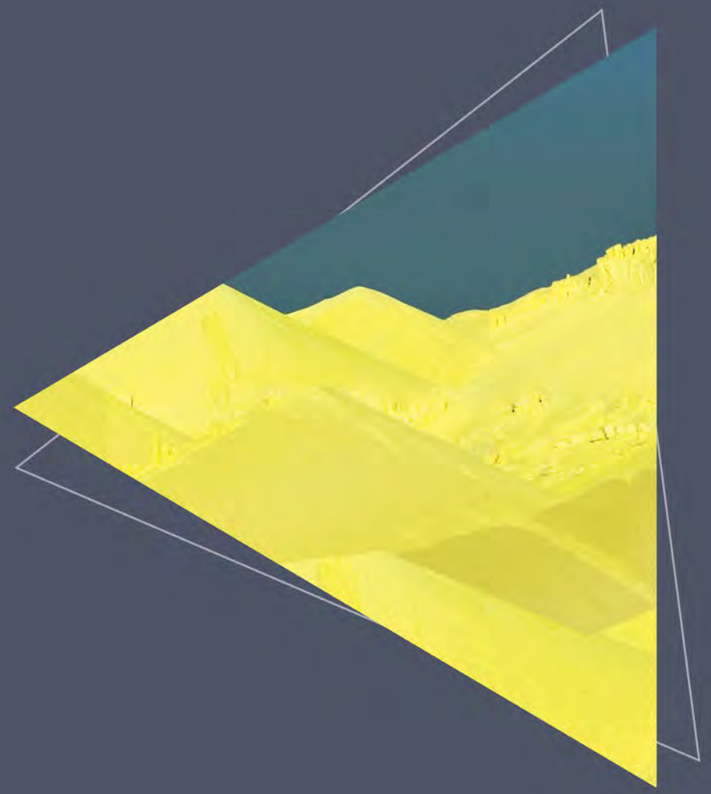
Transporting Molten Sulphur

Sulphur is produced in molten form at approximately 140°C in refineries. Where the transport distance is not long, molten sulphur can be transported through pipelines or inside insulated containers. The advantage of this method is that there is no need to solidify the sulphur in a refinery, and subsequently remelt it at the destination, reducing cost and energy consumption.
However, since sulphur often needs to be transported to far destinations this method is not practical in most cases.

Transporting Solid Sulphur

In this method, sulphur is solidified before it is transported which makes the distance between production plant and destination of no concern.

Studies show that solidified sulphur goes through 10 to 15 steps such as loading, transport, unloading, storage, etc.before it reaches its final destination. Solidified sulphur must be able to conserve its physical and chemical properties all steps involved in transport.



"Executing turnkey project in sulphur field is our main prospect"

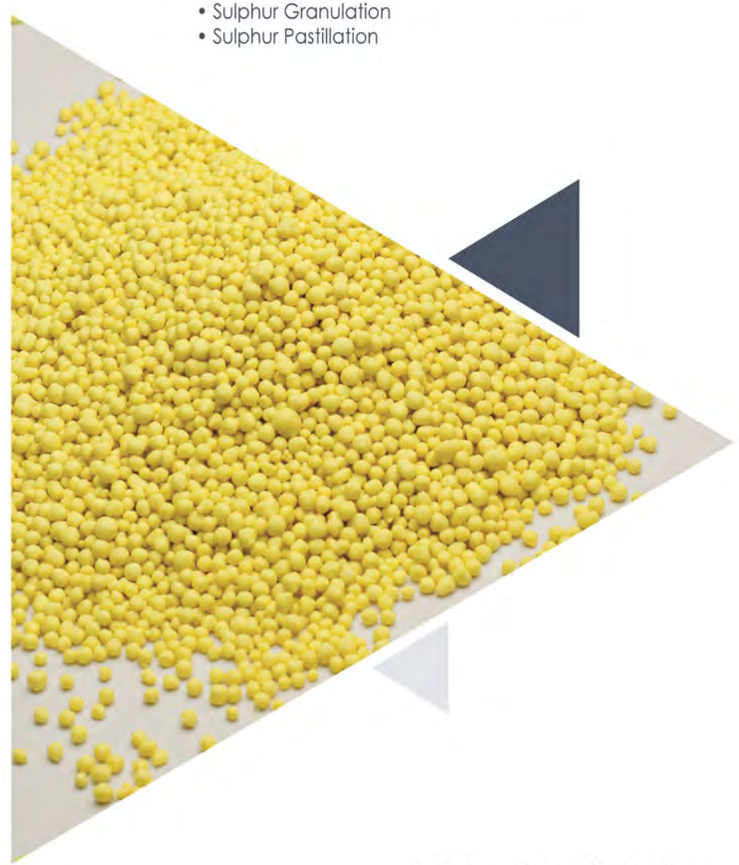
Sulphur Solidification Methods

There have been at least five different methods to solidify liquid sulphur used in the past, most of which have now been abandoned because of either low quality of the resulting product or the high cost of solidification processing or equipment maintenance.

There are two remaining methods for sulphur solidification that are still in use today:

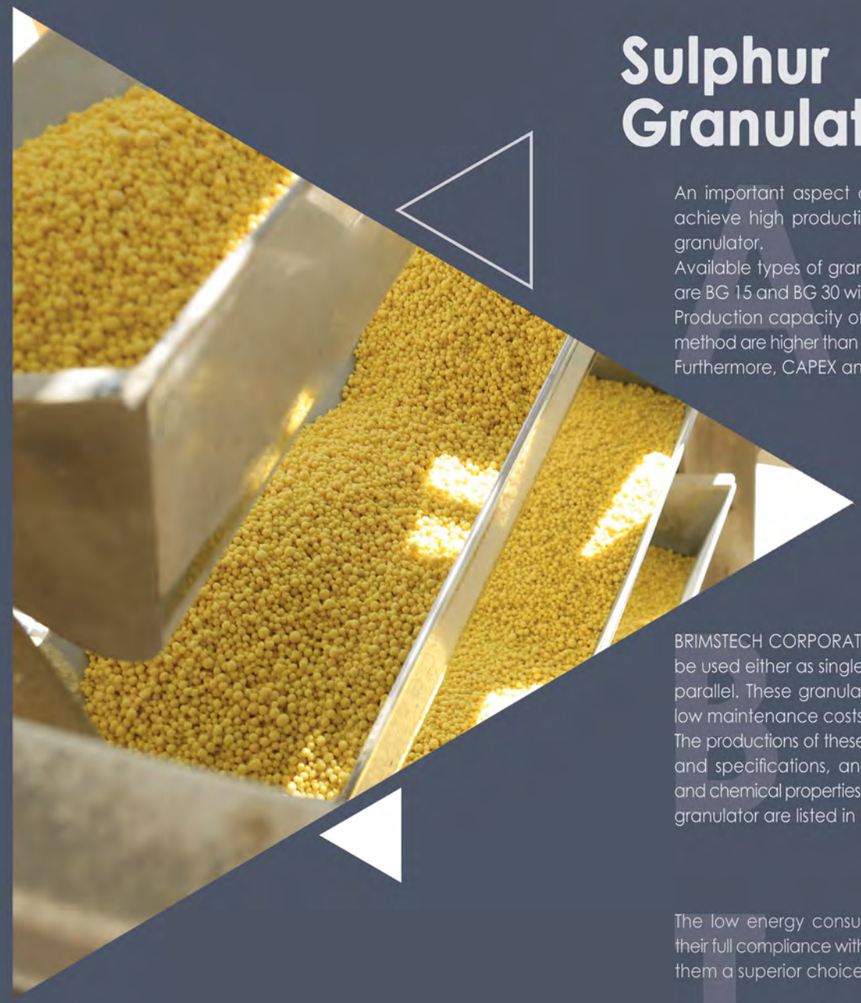
- Sulphur Granulation
- Sulphur Pastillation

"We Are Expert In Transforming Liquid To Solid"



Sulphur Granulation

This is the most common method of sulphur solidification. In this method, solid sulphur particles or seeds are coated with molten sulphur as they move through a rotating drum. With every added coat of molten sulphur the particles increase in size and weight until they finally reach a desired diameter



Sulphur Granulation

An important aspect of this technique is the ability to achieve high production capacity by just a single-unit granulator.
Available types of granulation drum based on capacity are BG 15 and BG 30 with 15 T/hr and 30 T/hr, respectively. Production capacity of a single unit and reliability of this method are higher than other sulphur solidification methods. Furthermore, CAPEX and OPEX are also lower.

BRIMSTECH CORPORATION sulphur granulation units can be used either as single-unit or multiple-units operating in parallel. These granulators are easy to repair and have low maintenance costs compared to similar equipment. The productions of these units meet international standards and specifications, and have highly desirable physical and chemical properties, some advantageous of BRIMSTECH granulator are listed in below.

The low energy consumption of these granulators and their full compliance with all environmental standards make them a superior choice.

Such advantages have compelled sulphur manufacturers to increasingly use this approach, making it the most common method of sulphur solidification used today.

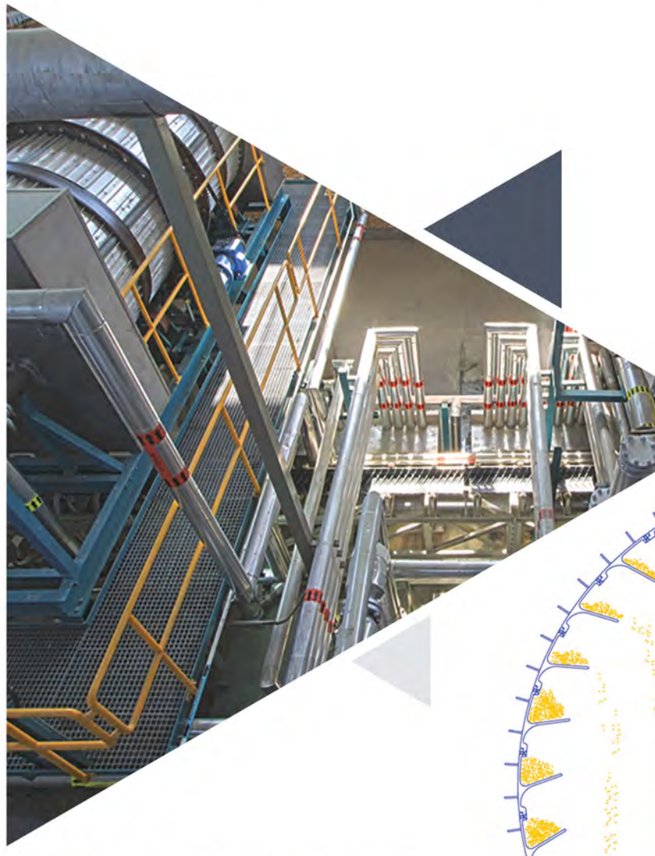
Range of production for a common single-unit granulator is between 360 T/d to 720 T/d

Granulation Process

Water sprays inside the drum constantly cool the sulphur granules. The hot temperature inside the drum (in excess of 100 °C) is due to the heat emitted from the sulphur granules, which vaporizes the sprayed water and exits the drum through fans. In this way, the fans ultimately control the temperature of the air inside the drum as well as removing vaporized water. The vaporized air that exhaust the drum also carries a small amount of sulphur dust. A dry cyclone filter then separates these particles and recovers them for incorporation into new granules.

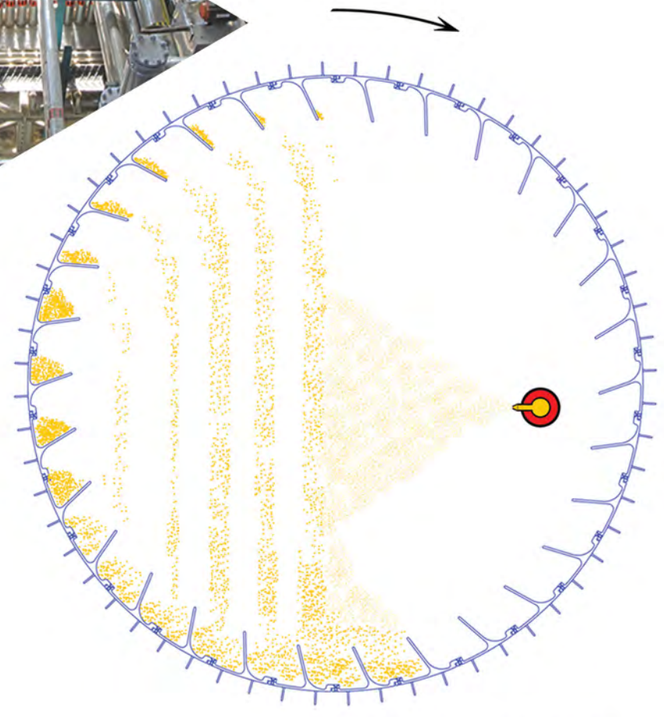
Inside view of Granulation Drum, During Manufacturing

Liquid sulphur gets stored in a special tank after degasification and is then pumped through a 250-micron filter into a granulator.
A granulator unit consists of a horizontally rotating drum which is sloped toward the bottom Liquid sulphur is sprayed through nozzles mounted on the header of the drum.
Inside the drum there are many sulphur particles or seeds (less than one millimeter in diameter) which are raised through blades inside the drum and then dropped from the top of the drum. The raising and falling cycle is repeated constantly creating a curtain of sulphur seeds inside the drum.

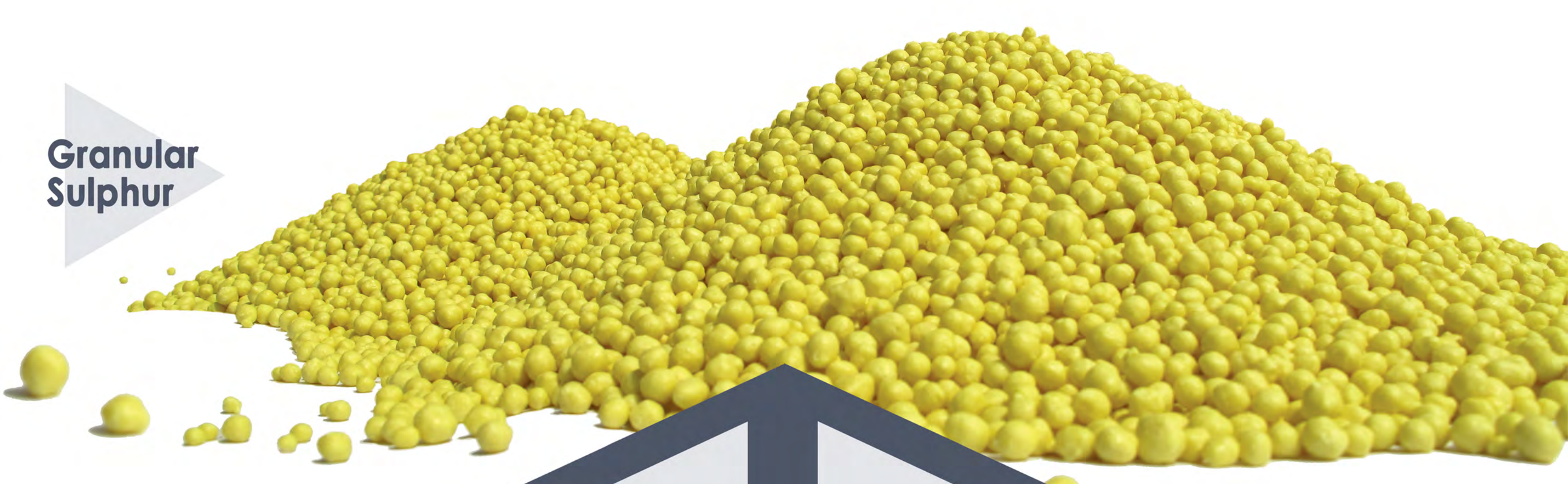


Molten sulphur is sprayed directly on this curtain and every time that a falling seed passes in front of the spray a layer of molten
sulphur it is deposited on its surface.
The layer then cools and solidifies while the cycle starts again. The cycle repeats until the seeds grow to a size of 2-6 mm at the time of exiting from the drum.

"Welding joints are not come in contact with sulphur and relevant problems are eliminated"



Granular Sulphur



Characteristics of Sulphur Granules

• Shape:	Spherical granules
• Size:	2 - 6 mm diameter
• Color:	Bright yellow
• Angle of repose:	25°
• Dust:	Less than 0.5% (wt)
• Bulk density:	Loose: >1040 kg/m³ Agitated: >1200 kg/m³

- Standard: Meet SUDIC specification
- Friability: Less than 2% SUDIC standard II
- Purity: High purity (as received)
- Moisture: Less than 0.5%(wt)
- Low dust or flake generation during transport
- Easy to re-melt
- Stable chemical and physical forms
- Low acidity

Key Features of Sulphur Granulators

• Capacity:	15 T/hr	30 T/hr
• Dimension:	H:4500 W:3500 L:7000 (mm)	H:5500 W:4500 L:11000 (mm)
• Weight:	13500 kg	22000 kg
• Electricity :	40 KW	120 KW
• Steam:	200 kg/h (3.5 bar g)	400 kg/h (3.5 bar g)
• Water:	450 Liter per hour	900 Liter per hour

- Easy start and shutdown
- Easy to operate
- Low maintenance
- Minimal spare part requirements
- Small plant footprint
- Allows increase in plant capacity by integrating additional units