



## **PARAFORMALDEHYDE PRILLS**

AN INNOVATIVE ALTERNATIVE WITH LOW-WATER CONTENT,  
BETTER REACTION RATES, AND IMPROVED LOGISTICS  
FOR H<sub>2</sub>S SCAVENGERS





## OVERVIEW

As a cost effective replacement for liquid forms of formaldehyde in multiple end-use applications, paraformaldehyde is widely used by hydrogen sulfide scavenger manufacturers seeking low-water content, improved reaction rates and improved logistics when compared to aqueous formaldehyde solutions.

Paraformaldehyde is a white, solid polymer of formaldehyde with the characteristic pungent formaldehyde odor. This solid form of formaldehyde is produced in spheres called prills, which are consistent in assay and in size, providing predictable solubility and reliable performance. Paraformaldehyde can be stored for up to a year and is easily shipped worldwide. Its longevity allows our customers to avoid the storage and geographic limitations of liquid formaldehyde and takes full advantage of the benefits formaldehyde has to offer.

In the increasingly competitive hydrogen sulfide scavenger industry, Celanese's paraformaldehyde can help scavenger producers stay ahead of the competition through advantages in production, logistics and handling compared to liquid formalin-based production. With over 60 years of expertise in understanding our product properties, we can provide you guidance in determining if Celanese paraformaldehyde is the best option for your application.



### HIGHER CONCENTRATIONS

If formalin is used for the production of H<sub>2</sub>S scavengers, azeotropic distillation may be required to reach the desired final concentration – adding extra costs and risking potential performance deterioration.

Paraformaldehyde-based triazine production can reach 80% concentrations without any additional steps for water removal, while formalin can only reach concentrations of 60% or lower. The higher concentrations reached with paraformaldehyde provide significant savings to the producer, while simultaneously increasing output.

### INCREASED CAPACITY

Higher concentration can also mean higher production capacity for batch production. An H<sub>2</sub>S scavenger made from paraformaldehyde could have a 33% higher capacity of liquid formaldehyde based processes in the same sized reactor.

The capital required for paraformaldehyde-based processes is also lower because no equipment is needed to reach higher concentration.

### IMPROVED LOGISTICS

Higher concentrations significantly reduce logistics costs compared to the lower concentrations, improving the profitability of producers and allowing them to be more competitive when pursuing new business.

Furthermore, higher concentrations allow producers to ship their scavengers to a wider customer base with reduced international shipping costs.

### INCREASED SHELF LIFE

Paraformaldehyde is easier to handle and has a longer shelf life than formalin, which can be stored only a few weeks or less depending on temperatures. However, paraformaldehyde has a shelf life of one year, ensuring consistent quality of the aldehyde being fed to the reaction and simplifying the supply chain of procuring and handling formalin.

### REDUCED STORAGE COSTS

Storing formalin requires a storage tank, and once the material exceeds its shelf life, the entire tank could become out of spec. Paraformaldehyde, conversely, is a non-flammable solid, which can be stored in a warehouse without further costs or precautions.



## PRODUCT DESCRIPTION

Paraformaldehyde is the solid polymer of formaldehyde composed of varying molecular weights of polyoxymethylene glycols. Celanese paraformaldehyde is produced in round spheres called prills.

### GRADES

Celanese offers paraformaldehyde at 91-93%, with the free or combined water balance. The combined water acts as a terminating agent for the polymer chains. Celanese's product assay is consistent between lots, providing reliable product performance.

### STORAGE AND HANDLING

- Paraformaldehyde has a much longer shelf life (up to one year) when compared with an equivalent formaldehyde solution.
- It can easily be shipped worldwide and does not have the geographic limitations inherent with formalin.
- Product containers must be kept tightly closed in a cool, dry and well-ventilated area.



### SOLUBILITY

Solubility varies by process and specific application. The rate of depolymerization of paraformaldehyde into formaldehyde will be largely influenced by pH and temperature. Both acidic and alkaline pHs and higher temperatures accelerate the rate of dissolution.

Paraformaldehyde, once dissolved, behaves like a methanol-free formaldehyde solution of the same concentration.

- Slightly **soluble** in alcohols
- **Soluble** in hot water where depolymerization will occur
- **Insoluble** in ethers, hydrocarbons and carbon tetrachloride
- Relatively **insoluble** in cold water

## PRODUCT PROPERTIES

Specifications		
		Limits
Formaldehyde, wt. %	Range	91.0-93.0
Water, wt. %	MAX	9.0
Acidity, as Formic Acid, wt. %	MAX	0.03
Iron, ppm	MAX	2
Ash, wt. %	MAX	0.01

### PRODUCT ADVANTAGES:

- Our product prills are consistent in assay and size, which ensures predictable solubility and reliable performance.
- Product shelf life is up to one year, providing more flexibility for downstream users.
- Product can easily be shipped worldwide.
- For resin producers, paraformaldehyde requires less dehydration, reducing processing time and increasing yields.
- Paraformaldehyde positively impacts utility costs, as it reduces the steam, cooling water and power for water removal; reduces waste water; enable the capability of charging more reactants to process equipment; and increases reactor capacity.



## ABOUT US

Celanese is a global leader in the manufacture of intermediate chemistry products, including acetic acid, vinyl acetate monomer, acetic anhydride, paraformaldehyde and other specialty derivative products. Our intermediate chemistry products and advantaged solutions represent the depth and breadth of industry knowledge, the capabilities to innovate, the dedication to creating value and the commitment to true partnerships to help our customers succeed.

We use advanced technologies to operate in accordance with economic and environmentally responsible processes, with a focus on product quality, plant safety, environmental protection and customer service. We are expanding our strong global position by growing production capabilities and technical expertise in the Americas, Europe and Asia to provide chemistry products to customers globally. Through technical advancements, we have more than 4,000 patents and a team of more than 500 technology experts dedicated to providing high-quality products and application-based expertise to our customers worldwide.



## SERVICE OFFERINGS

### TECHNICAL CAPABILITIES AND SUPPORT

Experienced team of world-class chemists, material and polymer scientists, engineers, and operators available to partner with customers to develop novel solutions and offer technical expertise to solve critical process needs.

### FLEXIBILITY FOR YOUR SUPPLY CHAIN

- Sole paraformaldehyde producer in Americas
- Production facility located in Bishop, TX
- Various packaging options of product in stock and ready to ship to best fit volume needs
- Product sold in full truck quantities or hopper rail cars
- Packaging types include 25 kg bags, 500 kg supersacks and 907 kg supersacks
- Robust logistics network to meet customer demands throughout the world

### RESPONSIBLE CARE

- We are a leader in Responsible Care, the global chemistry and industrial performance initiative set forth by the American Chemistry Council.
- Responsible Care is instrumental in helping chemical companies implement and maintain world-class management systems designed to improve performance, safety and environmental metrics.
- Our management system is based on specific ISO standards and conforms to the RCMS:2008 standard, as verified through third-party certification.
- The Bishop, TX facility implemented and maintains an Environmental Management System and is ISO 14001 certified.



**INTERMEDIATE CHEMISTRY**  
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