



SCIENTIFIC & TECHNICAL BROCHURE

TurbidityTrapp-CH

The World's Most Difficult Job
Has a Solution.

Chitosan-coated magnesium media for particle capture, turbidity reduction and water clarification.

01 PARTICLE CAPTURE

02 TURBIDITY REDUCTION

03 WATER CLARIFICATION

01 / TECHNICAL DATA SHEET

PRODUCT AT A GLANCE

Chitosan-coated magnesium media.

A reactive MgO / $\text{Mg}(\text{OH})_2$ core and a functional chitosan surface, engineered for particle capture, turbidity reduction and water clarification.



PARAMETER	TURBIDITYTRAPP-CH
Product identity	TurbidityTrapp-CH - Watch Water chitosan-coated reactive magnesium treatment medium.
Material architecture	MgO / $\text{Mg}(\text{OH})_2$ -based granules or beads with a chitosan coating. CH identifies the chitosan-functionalised surface.
Primary purpose	Surface-assisted particle capture, turbidity reduction and support for coagulation/flocculation under suitable water conditions.
Coating function	Chitosan provides amino and hydroxyl groups for particle interactions. Protonated amino groups contribute positive charge.
Reactive core	Magnesium chemistry provides hydration, acid neutralisation and magnesium release. Hydroxide precipitation depends on solution conditions.
Surface-charge control	The coated surface responds to water pH, ionic composition, coating structure and degree of protonation.
Process selection	Contact filtration, or a qualified reaction-and-separation process. Select the grade, flow, contact time and cleaning method together.
Performance criteria	Specify outlet NTU, pH, magnesium release, coating retention, rinse behaviour and hydraulic capacity for the application.

PRODUCT CONFIGURATION	Chitosan-coated magnesium medium. Grade-specific composition, coating loading and operating limits are defined in the supply specification.
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CHEMISTRY AT THE INTERFACE

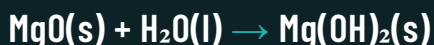
MAGNESIUM CHEMISTRY. CHITOSAN FUNCTIONALITY.



A reactive mineral core and a functional polymer coating bring complementary mechanisms into one material.

REACTIONS THAT DEFINE THE MATERIAL

HYDRATION



DISSOLUTION



ACID NEUTRALISATION



CHITOSAN PROTONATION



R represents the chitosan polymer backbone. Protonation gives amino groups a positive charge; the proportion protonated generally decreases as pH increases.



CORE

Reactive magnesium core

Hydration and acid demand govern magnesium release and pH response. Where pH and dissolved magnesium support Mg(OH)_2 precipitation, newly formed solids can assist particle capture. Effective hydroxide flocculation requires suitable reaction conditions.



COATING

Functional chitosan coating

The coating presents polymer groups to the water. Adsorption, local charge interactions and accessible polymer segments can assist particle attachment. Coating structure controls the balance between exposed mineral sites and polymer functionality.

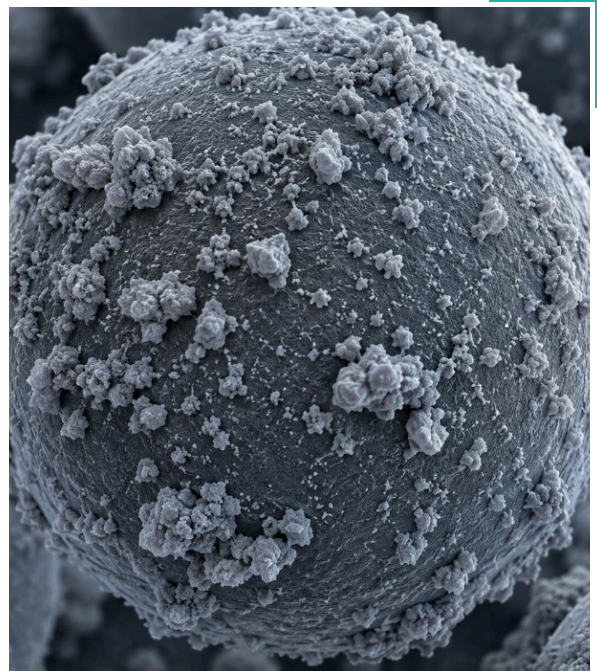
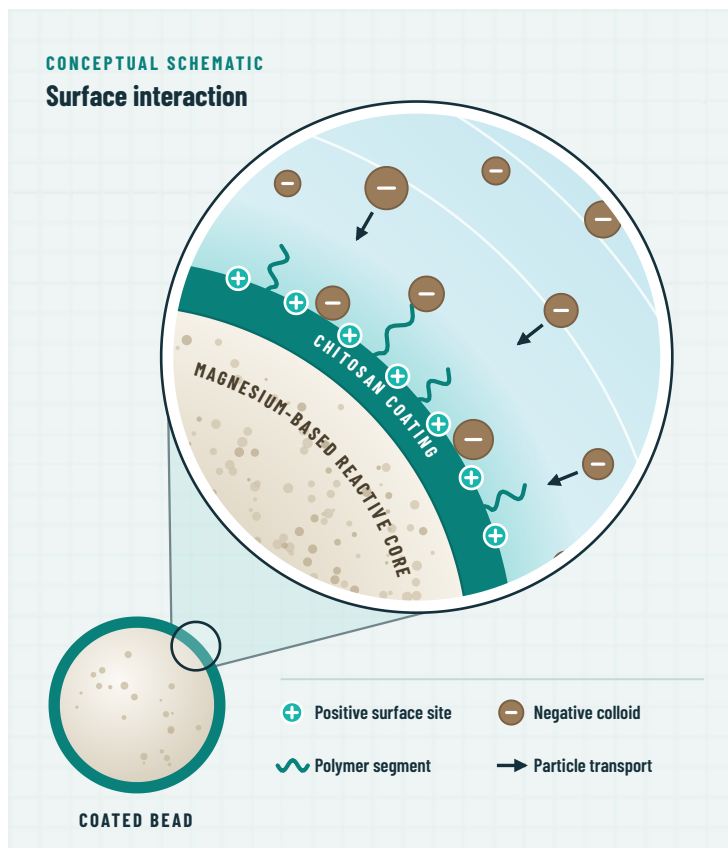
WATER pH 6-8

At water pH 6-8: the magnesium surface and chitosan coating must be considered together. Chitosan protonation changes across this range; near-neutral particle capture can involve adsorption and bridging as well as charge attraction.

SURFACE-CHARGE SCIENCE

A FUNCTIONAL COATING. A REACTIVE CORE.

TurbidityTrapp-CH combines a magnesium-based bead with a chitosan layer designed to interact with suspended particles.



Conceptual schematic: positive signs indicate protonated or positively charged sites under favourable conditions. The drawing does not specify coating thickness or measured charge density.

01 Transport to the surface

Water carries particles towards the coated bead. Diffusion, interception and settling assist contact. Effective use of the surface depends on flow distribution, contact time and access to the coating.

02 Attachment and retention

Particle adsorption and local charge interactions promote attachment where favourable. Accessible polymer segments may help connect particles or anchor them to the surface. Captured solids are removed through the selected cleaning process.

DESIGN FOCUS

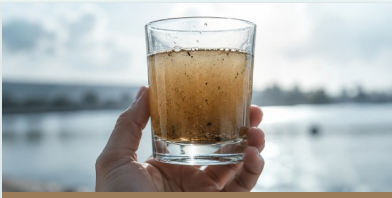
Preserve water access, reactive core activity and coating integrity together. The complete coated bead is the material to characterise and qualify for the intended water.

PROCESS INTEGRATION

CAPTURE THE PARTICLES. THEN REMOVE THE SOLIDS.

Match the chitosan-coated material to the process: contact filtration or qualified reaction, flocculation and separation.

A CHITOSAN-COATED CONTACT FILTRATION



FEED WATER

Characterise turbidity, pH and particle load



COATED BED

Surface contact, reaction and capture



TREATED WATER

Verify turbidity, pH and magnesium

CONTROLLED CLEANING → captured-solids removal

Rinse and condition the coated bed before service. Track outlet turbidity and pressure loss. Establish backwashing or cleaning conditions that release captured solids while retaining the functional coating.

B REACTION, FLOCCULATION AND SEPARATION

REACTION

Magnesium chemistry and pH adjustment

FLOC FORMATION

Polymer interactions and hydroxide capture

SEPARATION

Settling / filtration and final pH check

A separate reaction route requires demonstrated floc formation with the chosen grade and water. Immobilised chitosan and dissolved chitosan behave differently; define coating retention and release behaviour for the selected process.

Complete the separation: capture or settle the generated solids, manage the residual stream and verify outlet quality. Clarification depends on both particle interaction and effective solids removal.



CHITOSAN COATING TECHNOLOGY

BUILD THE SURFACE. CONTROL THE PERFORMANCE.

CH defines the product architecture: a chitosan coating on a reactive magnesium-based bead.

THREE COMPLEMENTARY FUNCTIONS

01

Charge interaction

Protonated amino groups can attract negatively charged particles. Water chemistry determines the effective charge state and strength of interaction.

02

Polymer-assisted attachment

Accessible polymer segments and adsorption sites can help particles attach to the coating. Bridging depends on chain accessibility, conformation and contact with particles.

03

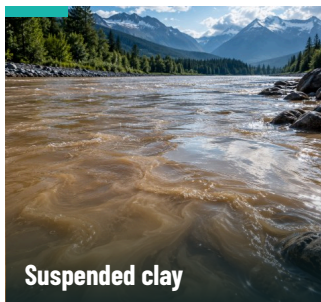
Reactive mineral chemistry

The magnesium core contributes alkalinity and magnesium release. The coating must allow the water contact needed for the intended mineral reaction.

COATING QUALITY IS PART OF PRODUCT QUALITY

Define coating loading, distribution, adhesion and water stability. Characterise chitosan molecular properties, amino-group availability and any crosslinking. Confirm that the selected coating preserves accessible surface area and withstands the intended service and cleaning cycles.

APPLICATION FOCUS



Suspended clay



Mineral fines



Process-water polishing



Industrial reuse pretreatment

Suspended clay, mineral fines, process-water polishing and industrial reuse pretreatment where particle capture and magnesium chemistry provide a useful combination.

DEFINE THE WATER. DELIVER CONTROLLED CLARIFICATION.

Specify the complete coated material and the operating conditions that determine outlet water quality.



APPLICATION AND PRODUCT PARAMETERS

PARAMETER GROUP	DEFINE AND VERIFY
Feed-water profile	Turbidity, suspended solids, particle size, pH, alkalinity, temperature, conductivity and organic matter.
Core and coating	MgO/Mg(OH) ₂ composition, chitosan loading, coating distribution, adhesion, surface charge and reactivity.
Hydraulic operation	Grain distribution, bed depth, service flow, contact time, pressure loss and cleaning requirements.
Water-quality control	Outlet NTU, pH, magnesium, polymer release and any downstream process requirements.
Service stability	Rinse behaviour, coating retention, performance after restart, media consumption and repeated cleaning cycles.
Grade specification	Set verified operating limits and confirm packaging, storage and handling requirements for the selected supply grade.

MEASURE CLARIFICATION. MEASURE CONSISTENCY.

$$\text{Removal (\%)} = 100 \times (\text{NTU}_{\text{in}} - \text{NTU}_{\text{out}}) / \text{NTU}_{\text{in}}$$



TurbidityTrapp-CH

Chitosan-coated magnesium chemistry for water clarification.

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