

**HYDRABOND<sup>®</sup> MAXI Series**

*Extremely high molecular weight (MAXI) cationic powder polymer for clarification and sludge dewatering*

**Description**

The HYDRABOND<sup>®</sup> 7000 MAXI series are linear, extremely high molecular weight, special purpose cationic powder polymers used in high shear environments for water clarification, sludge thickening and sludge dewatering. The HYDRABOND MAXI series comes in a range of charge densities from low, medium, high and very high cationic charge.

**Product Benefits**

- » Extremely high molecular weight for robust floc formation in high shear environments
- » Forms a tight, dense floc that promotes sedimentation and dewatering
- » Lower dose rates (up to 20% less)
- » Increased cake solids (up to 15%)
- » Produces a good quality, low particulate centrate

**Product Background**

HYDRABOND MAXI range of cationic powder polymers are extremely high molecular weight polymers designed for dewatering applications in high shear environments. Their extremely high molecular weight also makes them suitable for clarification via flotation and sedimentation.

For sludge dewatering, the HYDRABOND MAXI polymers are especially suited for use with:

- » decanter centrifuge
- » sludge screw press
- » sludge belt press

For clarification purposes MAXI polymers are well suited for use with:

- » industrial DAF applications
- » high rate clarification

The increased molecular weight of the HYDRABOND MAXI series (i.e. increase in chain length) when compared to traditional high and very high molecular weight cationic powder polymers gives the HYDRABOND MAXI range two distinct advantages:

1. improved bridging capabilities
2. improved resistance to chain length deterioration under high shear environments

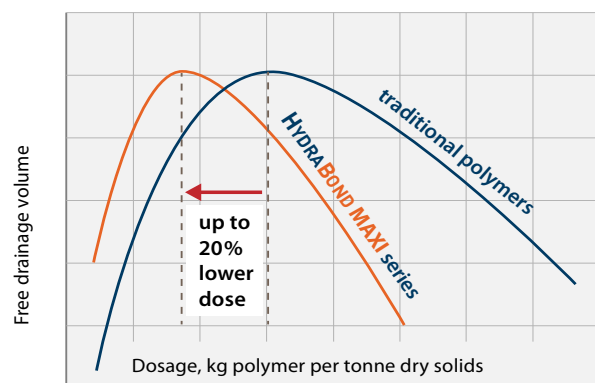
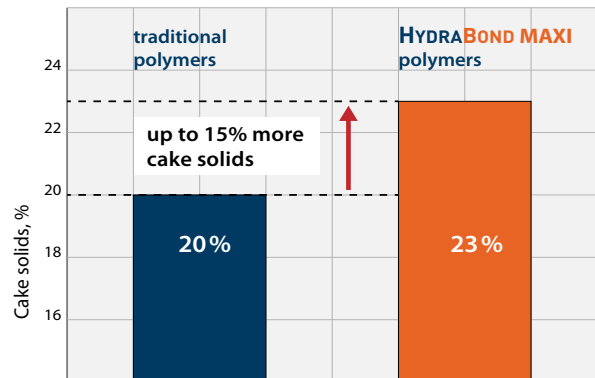
For most sludge types, an increased chain length provides an improvement in performance in terms of dose rate and cake dryness. For traditional polymers operating in high shear environments, not even

**Properties**

Form:	Powder
Colour:	Off-white
Bulk density:	0.75 g/cm <sup>3</sup>
Viscosity:	900 cP (0.3% solution)
pH	3.5–4.5 (0.3% solution)

an increase in dose rate can overcome the loss of performance due to chain length deterioration.

HYDRABOND MAXI polymers will often outperform traditional crosslinked and branched polymers under high shear conditions. This is because with these traditional polymer types the shear environment can degrade the





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polymer chain (effectively lowering the chain length) even though the molecular weight remains almost unaltered.

Under optimised operating conditions MAXI polymers will provide higher cake solids at similar dose rates to existing programs. This in turn will lead to lower operating costs through a reduction in sludge transport and disposal costs.

Alternatively, dose rates up to 20% lower can be used to achieve similar cake solids to existing programs.

### Product Range

HB-7725	low charge
HB-7745	medium charge
HB-7765	high charge
HB-7785	very high charge

### Product Activation

Due to the increase in molecular weight, HYDRABOND MAXI polymers should be made-down and activated at a strength between 0.05–0.3% with purpose built make-down equipment. For general application, Hydroflux recommends make-down at 0.2%.

The dissolution time of MAXI polymers is between 40–60 minutes dependent on polymer charge, agitation speed, make-down strength and water temperature. Higher charge, higher agitation speeds, higher water temperature and lower make-down strength contribute to lower dissolution times. Hydroflux recommends an additional 30 minutes retention after dissolution (in a storage or ageing tank) to help the polymer unravel to its full chain length.

MAXI powder polymers should be added slowly to a vortex or highly turbulent area of the polymer make-down tank. The aim is to wet (or hydrate) each polymer grain individually to avoid their agglomeration into a mass of dry polymer surrounded by a viscous gel, and to stop the formation of ‘fish eyes’.

High quality make-up water, low in hardness and free of turbidity, with low ferrous iron concentrations (< 0.2 mg/L) and low residual chlorine (< 0.5 mg/L) is recommended.

When MAXI polymers are prepared with typical low alkalinity towns water, the pH of a 0.3% solution will be around 4. With higher alkalinity make-up water, or if the solution is left to stand for too long, the pH may increase. At pH's > 6 polymer hydrolysis becomes significant and this

degrades polymer performance. To improve the stability of the final solution, the pH can be adjusted (if required) down to around 4–5. A 0.3% solution at pH 4–5 should be stable for up to 24 hours. Weaker solutions with higher pH values may begin to deteriorate after a few hours.

### Product Application

Due to the extremely long chain length of the HYDRABOND MAXI series, it is important to ensure the polymer is properly prepared with sufficient ageing time to allow the polymer to unravel completely.

A solution of MAXI polymer can be dosed as made up. Alternatively in-line post dilution by 5–20 times, just prior to application may improve polymer/sludge solids mixing and ensure optimum dose rates.

Dose rates and dose locations are best determined by bench testing and followed up with on-site optimisation. Dosing with diluted solutions of MAXI polymer will improve mixing. Using two separated dose points may reduce overall consumption.

Because of the extremely long chain length of the HYDRABOND MAXI polymers, the dose location of MAXI polymers for sludge dewatering applications is expected to be further away from the sludge dewatering unit (further upstream) when compared dose locations of traditional polymers. This allows the MAXI polymers extra time and mixing energy so that they can properly mix with the sludge and allow the extra chain length to bridge intimately with the sludge particles. The increase in shear experienced by the polymer due to the dose location being further upstream will be advantageous as it will increase the amount of polymer/sludge mixing.

For sludge dewatering applications the dose rate is highly dependent on the type of sludge to be treated. Primary sludge may require 2–5 kg/tonne dry sludge, while secondary and digested sludge may require 2–10 kg/tonne dry sludge.

Note: For a sludge feed solids of 2%, the dose of 2–10 kg/tonne dry sludge equates to a dose rate of 40–200 mg/L of MAXI polymer on sludge flow.

Spills of neat MAXI polymers should be swept up and containerised for disposal. Do NOT wash or hose spills with water as the resultant area will become very slippery and product clean up will be more difficult and time consuming. Do not let any spills (or the resultant water from the hosing of spills) enter the stormwater system.