

Cutrine® Plus Granular Algaecide Sink/Release Rate Report



Cutrine® Plus Granular Algaecide is the product of choice for targeted treatment of bottom growing algae. Cutrine® Plus Granular Algaecide provides a targeted release of a chelated copper formulation that is active in a wide range of water qualities resulting in reduced growth usually within days after application.

Cutrine® Plus Granular Algaecide is formulated with chelated copper to prevent the precipitation of copper with carbonates and bicarbonates in the water. The copper is chemically locked with the chelants to allow the copper to remain in the water column longer than traditional copper sulfate formulations. Having a longer residence time in the water column, the copper will have a longer contact time with the target organisms resulting in a more effective treatment.

Liquid products rely on diffusion to reach the intended area; granular products sink to the targeted problematic species, providing a more efficient uptake of the algaecide as the chelated copper is released over time.

To demonstrate the advantages of a chelated granular application, we have determined the granule sink rate and analyzed the copper release rate profiles under controlled conditions.



Method

Release Rate	
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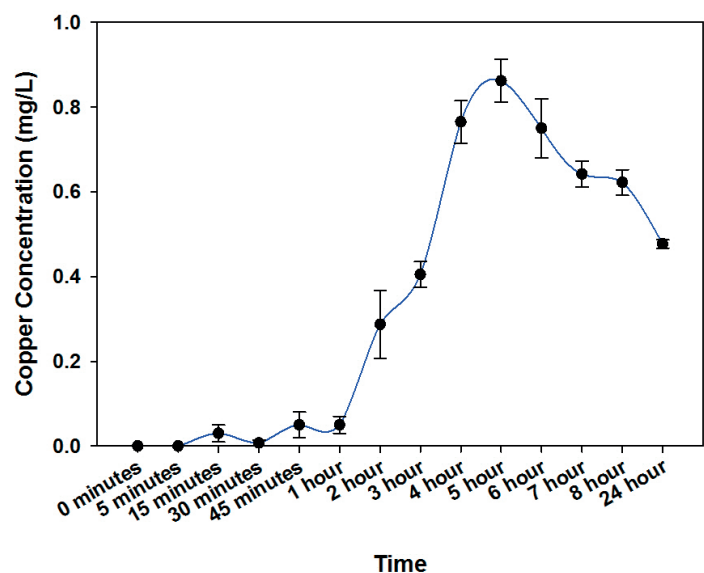
4 Aquaria Total	
Dimensions	11.5" x 11.5" x 24" / 29.2 cm x 29.2cm x 60.9cm
Water Filled to a Depth of	21.5" / 54.6cm (Total Volume: 46.5 L)

Samples were collected after application at:			
0 min	5 min	15 min	30 min
45 min	1 hour	2 hours	4 hours
6 hours	7 hours	8 hours	24 hours

Results

Release Rate Study Found:

- Cutrine® Plus Granular Algaecide readily and rapidly sinks to the bottom
- Copper release begins within the first five minutes after application
- Water movement/stirring increases both the release and mixing of copper
- Without aeration/mixing, the majority of copper remains at the bottom on target
- Majority of copper remains at the point of growth, targeting benthic plants



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Method

Sink Rate	
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4 Aquaria Total	
Dimensions	8.5" x 8.5" x 61" / 21.5cm x 21.5cm x 155cm
Water Filled to a Depth of	60 inches / 152cm (Total Volume: 71.2 L)

Samples were collected after application at:				
5 min	15 min	30 min	1 hour	2 hours
3 hours	4 hours	5 hours	24 hours	48 hours

Copper residues were measured at the bottom of the aquaria at 24 and 48 hours.

Results

Sink Rate Study Found:

- Up to 90% of granules took 20-21 seconds to sink 5ft (with the remainder taking up to 36 seconds)
- Granules sink rapidly and any copper loss, within the first 5ft, is negligible
- Cutrine® Plus Granular Algaecide sinks rapidly and releases the majority of copper at depth
- When mixing vertically, copper release tends to be a slow process, increasing targeted contact time

Conclusion

- Cutrine® Plus Granular Algaecide sank through 5ft of water in 20 seconds
- Copper release began within the first 5 minutes of application
- Without aeration/water agitation, copper release was more gradual taking 4-5 hours to reach target concentrations near the water surface
- Without aeration/water agitation, both shallow and deep water had higher copper concentrations near the bottom at 24 and/or 48 hours

References

Wersal, R. [2017]. Determination of the Sinking Rate and Release Rate Profile of Cutrine® Plus Granular Algaecide. Technical Document; Lonza Archives. Surface Water Report. Alpharetta.

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