Johnson Screens

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Aqseptence Group

Z-Alloy Intake Screens compared to Zebra Mussel resistant coatings

In the early 1990's, Johnson Screens introduced Z-Alloy for intake screens that inhibit the attachment of zebra mussels to passive intake screens, which was a growing crisis in the Great Lakes.

A beta site began at the J.H. Campbell Power Plant in 1993, where Johnson Screens proved the effectiveness of Z-Alloy design.

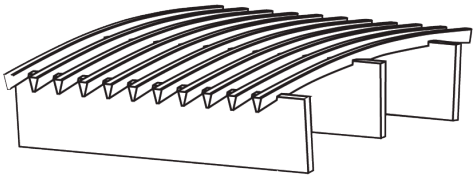
Zebra Mussel infestation has spread throughout the US and the rest of the world, Johnson Screens has installed hundreds of Z-Alloy passive intake screens worldwide, allowing for municipalities, power plants and industry requiring raw water from lakes and rivers, to have access to an uninterrupted water source.

Some other intake manufactures offer screens that claim to deter Zebra Mussel attachment by using coatings, a much less expensive alternative.

Coating Issues

Johnson Screens was approached at a trade show by an intake screen user that was drawing water from Lake Champlain in Vermont and having issues with their screen.

The man stated after about three years of using their coated intake screen, they were having to periodically remove the screen (pictured on the left) for manual cleaning because much of the coating had worn off and Zebra Mussels were blocking off the screen.



A wedgewire screen is an extremely difficult item to coat properly.

Example
T-24 Screen with #69 wire - Non coated vs. Coated

Specified Slot Width	Open Area	Rated flow at 0.5 fps	Coated Screen Real Open Area	De-rated flow to stay under 0.5 fps
0.125″ (3.2 mm)	63.78%	3400 gpm	60.56%	3200 gpm (5.9% less flow)
0.079″ (2 mm)	52.67%	2800 gpm	47.01%	2500 gpm (10.7% less flow)
0.039″ (1 mm)	35.45%	1900 gpm	24.47%	1300 gpm (31.6% less flow)

Note – If the wire size is reduced to accommodate the coating thickness and maintain the needed open area - then the issue is the actual strength of the screen itself.

Note – The above is all assuming the coating is applied in an exact even way, which is not what it would be. Blinding across the tight slot widths would also be a concern.

A single coating of an intake screen is, at a minimum in the, 0.008 in. thick range. Now a slot that was manufactured to +/- 0.002 in tolerance, is now reduced by a minimum of 0.016 in. due to the coating.

Slot velocity and headloss data are traditionally calculated based on the non-coated screen and can be affected by coatings, as shown by the data in the example.

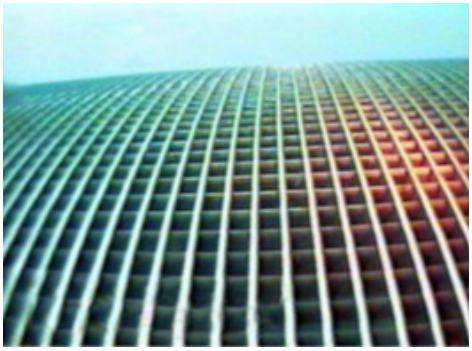
WE Power – (24) T-96HCE (2.2 BGD)

Handling

Handling and mishandling with coated screens, now becomes critical at the job site to ensure that the screens are not damaged in any way before or during the installation. This is not an issue with a solid material.

NSF-61 Certification

When Johnson Screens introduced Z-Alloy to the market, it was tested it and approved using NSF-61 Certification criteria. Recently Johnson Screens has submitted all intake screen products, including Z-Alloy, to NSF and received NSF-61 Certification for use in Drinking Water Applications.



Z-Alloy Screen after six years of service

Coatings Summary

The use of coatings on an intake screen as a long term solution to repel zebra mussels has not been proven over time.

A number of manufactures coatings contain a solid solution of copper and nickel containing at least 65 percent copper. This coating can wear down over time, be gouged off during transportation or installation and could be damaged over the life of the screen. Johnson Screens' intakes are constructed from a solid copper nickel wire, and as long as it is kept clean, will provide years of Zebra Mussel protection.

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