

Water Treatment Using Reactive Filtration Media

With the imperative for Water Sensitive Urban Design, Low Impact Development and Total Water Cycle Management, there has been increasing interest in using filtration systems as a solution for the treatment and reuse of stormwater and low flow industrial waste water runoff. STAR Water Solutions has released a range of Reactive Filter Media that treat polluted stormwater and low flow industrial waste water.

Custom Designed

STAR Reactive Filter Media is custom designed for specific treatment applications using a blend of tailored components in defined proportions that are engineered for specific performance requirements such as contaminant removal, lifespan, hydraulic conductivity, compaction and plant growth. The STAR Reactive Filter Media product range includes Ecomedia® and Infiltrat®.



The **Ecomedia®** range is custom designed to achieve performance requirements in vegetated applications such as:

- Wetlands.
- Rain gardens.
- Landscape gardens.
- Sports fields, Golf courses.
- Fill around permeable pipes.
- Roof gardens, Planter boxes.
- Swales.
- Sand filters.
- Leach drains.
- Retaining walls.
- Building site runoff.
- Water harvesting/reuse.

The **Infiltrat®** range is custom designed to achieve performance requirements in non vegetated applications such as:

- Car park.
- Retaining walls.
- Building site runoff.
- Water harvesting/reuse.
- Sub-surface drainage systems.
- Under permeable paving system.
- Pavement sub base (structural grade).
- Pavement sub base (non structural grade).
- Sand filters.
- Detention basins.
- Fill around permeable pipes.
- Kerb-gully by-pass system.

Pollutant Removal Performance

Scientific studies have shown conclusively that STAR Reactive Filter Media can remove pollutants from water to enable harvesting and reuse or be safely discharged into waterways.

A distinctive strength of the media is its ability to remove dissolved contaminants such as nutrients (e.g. nitrogen, phosphorous) metals (e.g. copper, lead, zinc), bacteria (e.g. faecal coliforms) and hydrocarbons (e.g. petroleum) from stormwater. Particulates can be removed by STAR Reactive Filter Media through physical filtration. However, the lifespan of the media is far greater when particulates are removed through primary treatment.

Treatment of dissolved contaminants is achieved by chemical and biological processes created by the selected components in the filter media. These processes include:

- Sorption.
- Ion exchange.
- Microbial biodegradation.
- Precipitation.
- Volatilisation.
- Phytoremediation.

Conclusion

The results from the laboratory and field research indicate that an engineered reactive filtration media can successfully remove substantial quantities of contaminants from water, allowing potential harvesting and reuse.

Typical Treatment Results

Parameter	Inflow Mean value	Outflow Mean value	Percentage Removal
Total Zinc (µg/L)	276	6	97.8 %
Total Lead (µg/L)	133	1	99.2 %
Total Copper (µg/L)	75	5	93.3 %
Total Nitrogen (mg/L)	1.97	1.08	45.2 %
Total Phosphorous (mg/L)	0.264	0.057	78.4 %
PAH (ug/L)	3.7	0.6	83.8 %
Turbidity (ntu)	448	42	90.6 %
Suspended solids (mg/L)	291	50	82.8 %

References

- AWT (1999) Powells Creek East Catchment Stormwater Quality Scheme, Australian Water Technologies.
- <http://www.environment.nsw.gov.au/stormwater/usp/grants/s1f0099.htm>. Accessed 24 June, 2006.