



# TECHNICAL REFERENCE

## TEST DATA ON REACTIVE CORE MAT® SEDIMENT CLOGGING POTENTIAL

The following report summarizes gradient ratio testing, per modified ASTM D5101, which has been performed by the University of New Hampshire on several individual geotextiles and laminated Reactive Core Mat (RCM). This data gives the designer information about the clogging or piping potential of RCM-sediment interfaces. The test setup involved placing the geosynthetics and estuarine sediment in a column. Six ports along the column profile are connected to manometers to allow for measurement of hydraulic gradients. For this modified test, where soil is substituted with sediment, the gradient ratio is defined as the ratio of the hydraulic gradient of the sediment-geotextile section to the hydraulic gradient of the sediment section.

Generally accepted interpretation of gradient ratio results are:

- ▶ A gradient ratio of one or slightly less is preferred.
- ▶ A gradient ratio  $< 1$  is an indication that some soil particles have moved through the system. A continued decrease in gradient ratio indicates piping. Piping of soil should be  $< 2500 \text{ g/m}^2$ .
- ▶ A gradient ratio  $> 1$  means that there is some system clogging, although if system equilibrium develops then the flow may satisfy design requirements. A gradient ratio  $> 3$  may be indicative of an unacceptable degree of clogging.

The allowable gradient ratio values and related flow rates for soil-geotextile systems will be depend upon the site-specific application.

The results on the laminated RCM show:

- ▶ There was initial piping, but it quickly stopped and was limited to  $< 400 \text{ g/m}^2$ .
- ▶ The gradient ratio was one or less than one at the end of the test.
- ▶ The nonwoven geotextile appeared to control the behavior of the RCM.

The results indicate that no clogging developed in the sediment-RCM system.

Additionally, tests on the geotextiles showed the sensitivity of the test setup. The authors believe that one of the geotextile tests yielded a false high gradient ratio. They feel that it was a case of piping within the sediment sample originating near one of the manometer ports. They recommend:

- ▶ Placing the sediment in several lifts
- ▶ Making sure that all bubbles were removed between lifts, and
- ▶ Allowing the sediment to consolidate.

This data is for informational purposes only and is not intended to replace project-specific gradient ratio testing, which CETCO recommends. CETCO makes no warranty regarding the use of the data.