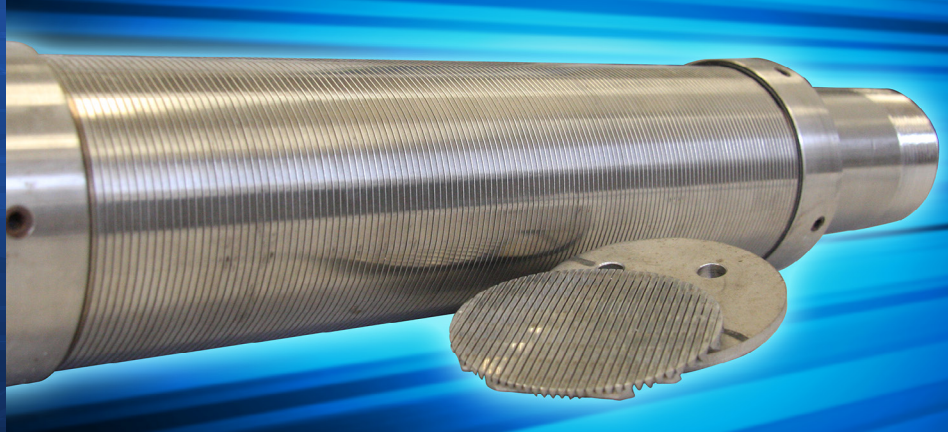




SOUTHWEST RESEARCH INSTITUTE



Sand Control Screen Coupon Erosion Testing

Since developing an erosion test for sand screen coupons in 1998, Southwest Research Institute® (SwRI®) has conducted hundreds of tests simulating erosion due to passed particles. Through the extensive use of two dedicated test facilities, SwRI has amassed a wealth of experience and expertise.

Applications

Specific erosion rate data on sand screen coupons can provide valuable information in the following areas:

- Comparing different products intended for the same application
- Understanding the effect of fluid velocity and viscosity
- Evaluating new or improved screen designs
- Understanding the effect of erosion in production and injection operations
- Simulating gravel packs and perforations

Standardized Testing

SwRI has developed a standardized test to provide valuable specific erosion information in two days. Only the flow rate and particle concentration need to be specified for testing:

- Particle concentration — Up to 10,000 ppmw
- Flow rate — 12–42 gpm (8,000–28,000 bpd/ft²)

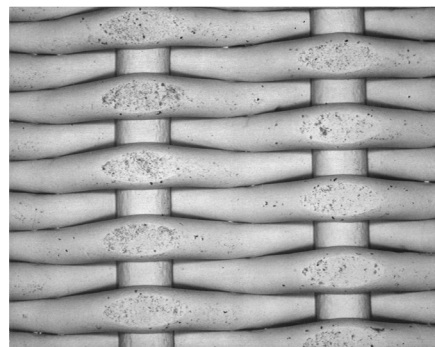
Standardized Test Fixed Parameters

| Test Condition | Dimension |
|--------------------------------|--|
| Particle material | Silicon carbide |
| Particle size | 320 grit (roughly 30 μm d50) |
| Maximum test duration | 48 hours |
| Maximum dP across test section | 150 psid* |
| Test fluid | Water |
| Sample size | 3.360 inches, +0 / -0.005 (assembly stacks up to 0.875 inches thick) |

* Base pipe coupons will be required to have a groove for an O-ring if the dP is above 75 psid.

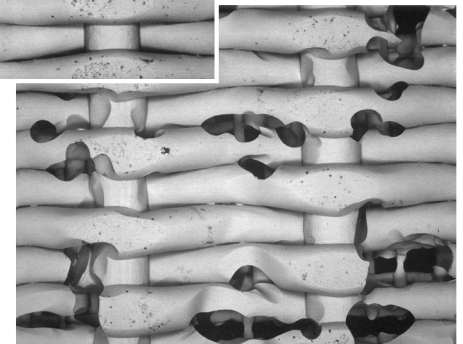


Typical screen assembly components



New metal mesh screen

D004069



Eroded metal mesh screen

D004068

Custom Testing

SwRI offers customized sand screen coupon erosion tests in which additional parameters can be varied, including:

- Flow rates up to 80 gpm
- Particle size
- Various assembly combinations
- Jet impingement testing
- Effect of material type
- Different screen coupon assembly dimensions (e.g., stacks up to two inches thick, customized coupon holders)
- Test fluid (allowing for variations in viscosity and density)
- Customized inlet and outlet geometries to simulate specific applications (e.g., gravel packs and perforations)

Test Facilities

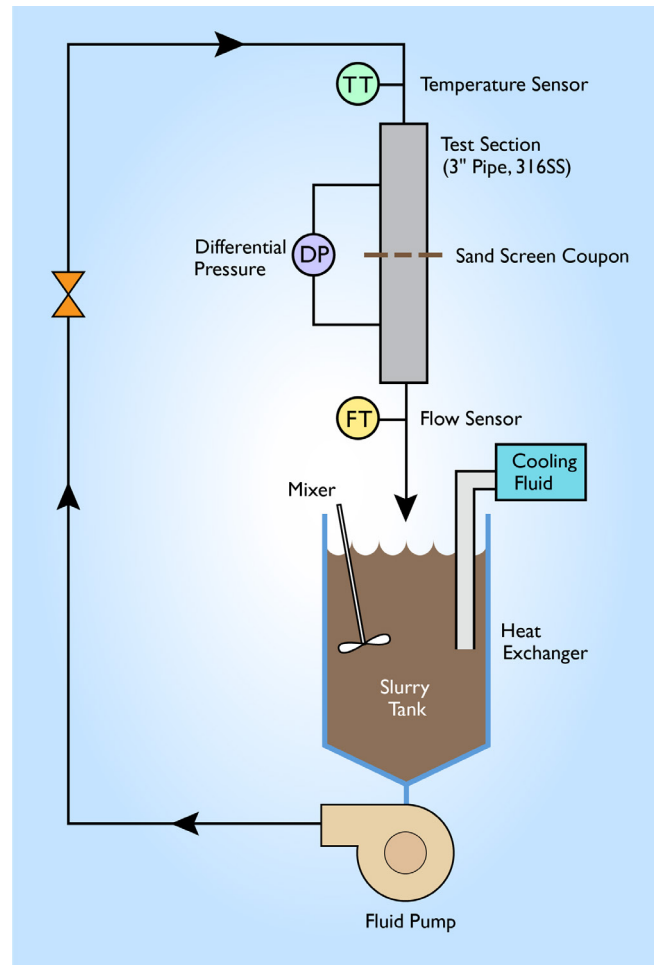
Facilities include two test rigs for erosion tests on sand screen coupons. SwRI also offers testing services on customized setups.

Each existing test rig consists of a progressive cavity pump with a variable-speed drive, fluid storage tank and mixer for the abrasive slurry, instrumentation to measure flow rate and pressure drop, and a test section for holding the screen sample.

The test section consists of a 9-foot long section of 3-inch diameter 316SS Schedule 40 pipe, mounted vertically, with flow from top to bottom. The test coupons are mounted in a screen holder assembly installed between pipe flanges.

Operating Range of Erosion Test Rigs

| Test Parameter | Test Rig A | Test Rig B |
|--|------------|------------|
| Fluid flow rate (gpm) | 12 – 42 | 12 – 80 |
| Maximum operating pressure (psi) | 300 | 300 |
| Typical solid size (microns) | 10 – 40 | 10 – 90 |
| Fluid velocity approaching screen (ft/sec) | 0.5 – 1.9 | 0.5 – 3.5 |
| Fluid temperature (°F) | 80 – 90 | 80 – 90 |



Schematic diagram of screen erosion test rig

We welcome your inquiries.

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