

# Traditional and Advanced Thick-Wall Cylinder Tests



Core Lab operates a full service geomechanics laboratory that provides customers with test data and engineering analyses to predict wellbore stability. Wellbore stability and sanding predictions are simulated in the laboratory by performing a traditional industry standard thick-wall cylinder test or advanced thick-wall cylinder test.

## Common problems encountered with borehole instability:

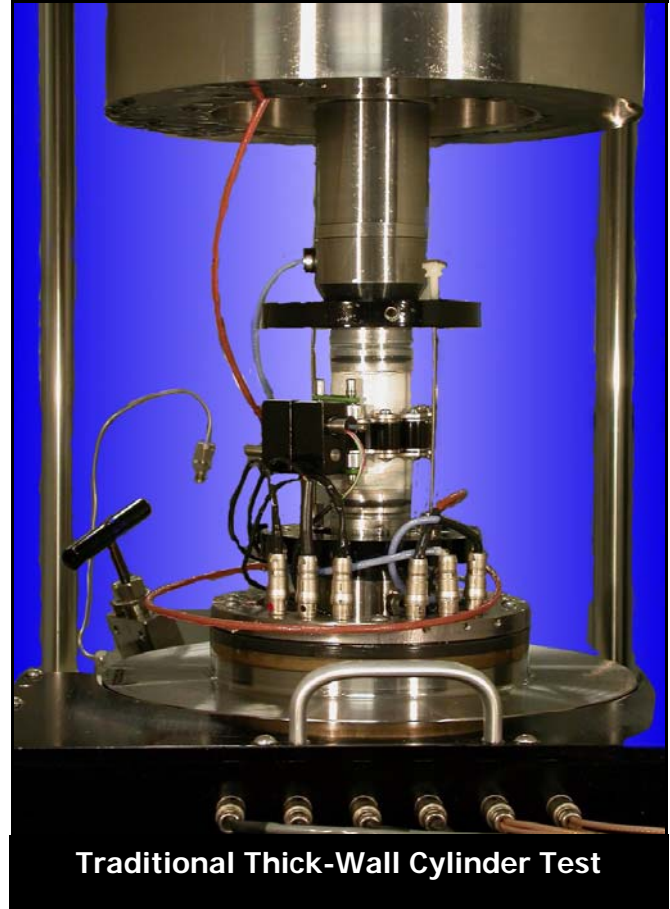
- Sand production
- Lost circulation
- Stuck pipe
- Uncontrolled fracturing
- Breakout
- Hole collapse
- Casing failure
- Washout

## Benefits of Traditional Thick-Wall Test:

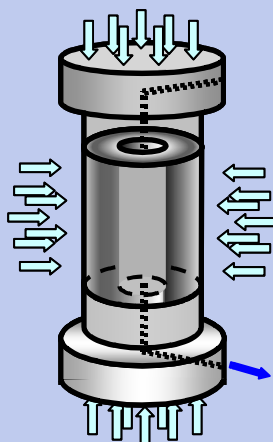
- Simulates perforation hole failure
- Provides initial and catastrophic stress for perforation hole failure
- Tests can be performed either hydrostatically or under triaxial conditions

## Benefits of Advanced Thick-Wall Test:

- Performed on full diameter cores
- Provides more accurate strain and stress data at failure
- Directly monitors sand production onset
- Ability to simulate downhole flow conditions



Traditional Thick-Wall Cylinder Test

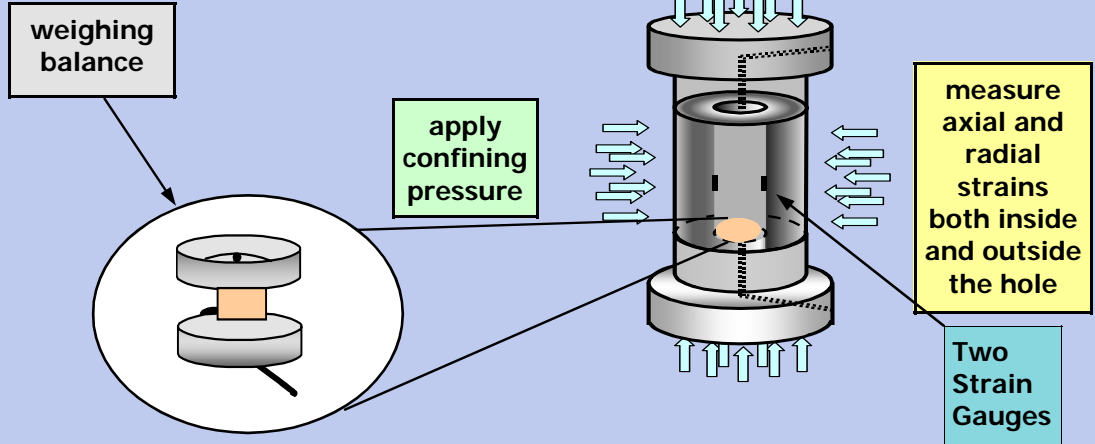


## Traditional Industry Standard Test Lab Simulation of Perforation Failure

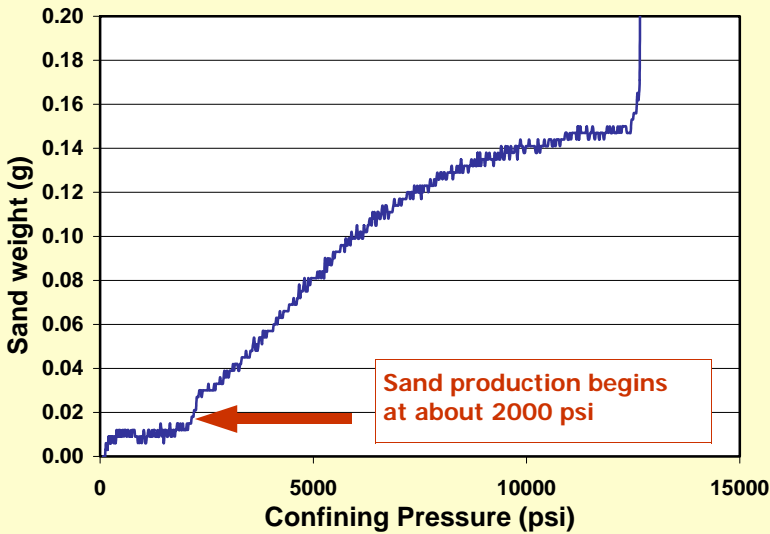
The thick-wall cylinder test employs a geometry that simulates actual loading conditions under downhole stresses. This provides direct measure of pressures under which a hole will start producing sand or cause other problems like casing collapse. Armed with this information, an operator can control conditions to maintain wellbore stability.

# Advanced Thick-Wall Cylinder Test

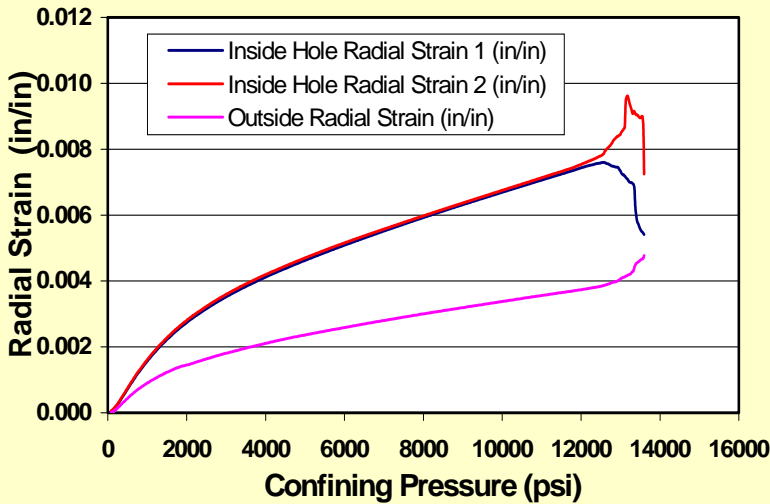
The advanced thick-wall cylinder test is equipped with a weighing balance which provides a direct measure of pressures under which a hole will start producing sand and the amount of sand produced in the hole.



**Advanced Thick-Wall Cylinder**  
Amount of sand produced vs. confining pressure



**Advanced Thick-Wall Cylinder**  
Radial Strain of inside hole vs. confining pressure



# Lab Simulation of Perforation Failure



Whole core sample after advanced thick-wall cylinder test. (inset)

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