QRT-series QUICK RELEASE TRIAXIAL CELL

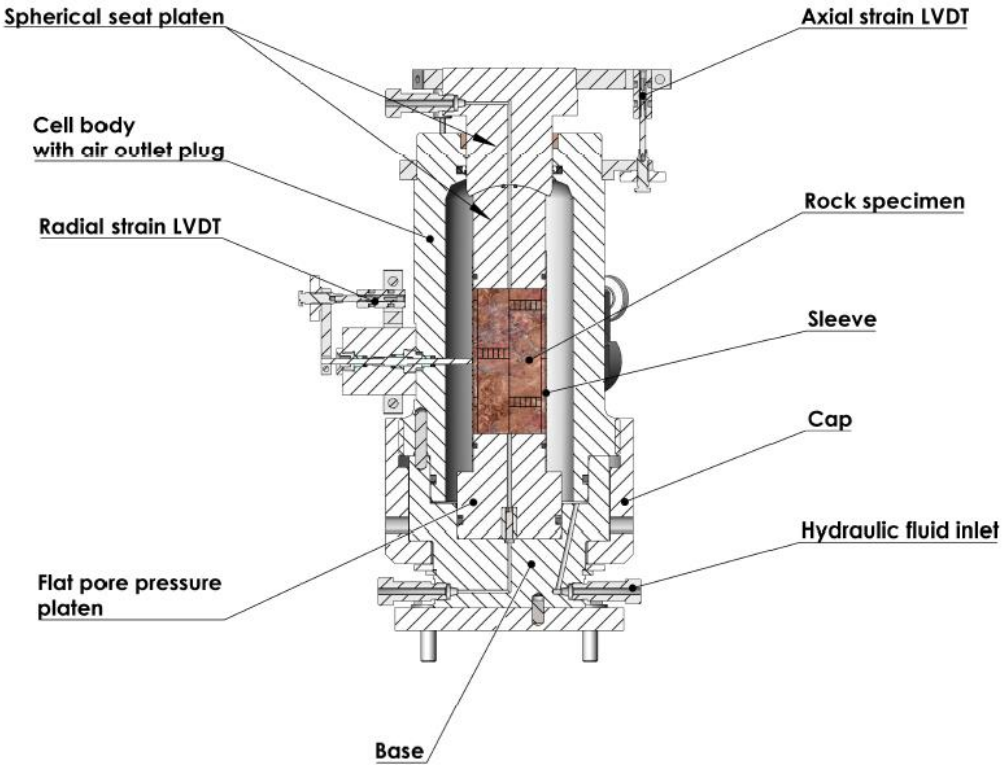
APPLICATIONS

Tests performed on a series of rock specimens under different confining pressures allow the user to determine:

- Strength and elastic properties
- Shear strength at different confining pressures
- Angle of shearing resistance and cohesion
- Modulus of elasticity and Poisson's ratio

DESCRIPTION

The Quick Release Triaxial Cell enables streamlined testing for rock specimens with diameters that vary from 21.5 mm (EX) to 54 mm (NX). The rock sample, along with the top and bottom platens, is enclosed in a heat-shrinkable sleeve. This entire setup is then precisely positioned and centered in the cell using a guiding tool. After alignment, three instrumented lateral actuators equipped with pressure-compensated LVDTs make contact with the sleeve to accurately measure diametral strains. Axial strains are gauged using two averaging vertical LVDTs. For effective operation, the QRT series cell needs to be integrated into a system that includes an external axial load actuator, such as a load frame, and one or more high-pressure pumps for fluid injection and confining pressure application.



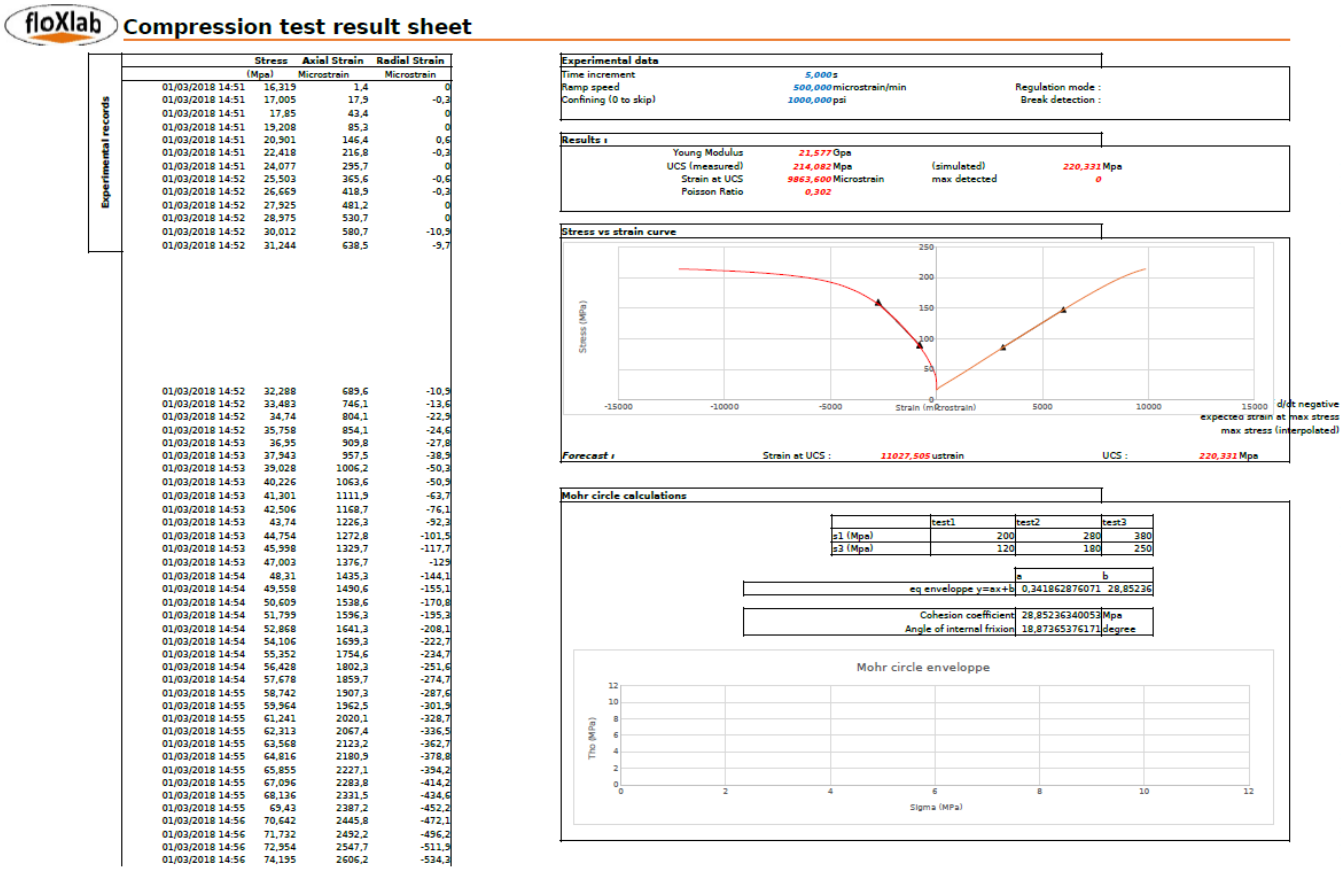
TEST PROCEDURE

First, ensure that the rock specimen meets a minimum length-to-diameter ratio of 2 and grind its ends flat to a parallelism ranging between 0.025 mm and 0.012 mm, depending on the specimen's diameter. Next, insert the rock sample along with the top and bottom platens into a heat-shrinkable sleeve. Use a guiding tool to accurately lower and center this assembly within the cell. Once properly aligned, engage three lateral actuators equipped with pressure-compensated LVDTs to come into contact with the sleeve, allowing for precise measurement of radial strains. Axial strains are captured using two vertical LVDTs that provide an average reading. After the confining chamber is pressurized, place the Quick Release (QR) cell into a suitable loading frame and apply a minimal axial load to secure its position. Once the desired confining pressure has been set, you can proceed with the triaxial test.

FEATURES

Standard:	ASTM (D2664)
Confining pressure:	70 MPa (10,000 psi)
Max axial load :	500 KN
Specimen diameter:	21.5 mm (0.845 inch)
	25.4 mm (1.0 inch)
	30.1 mm (1.185 inches)
	38.1 mm (1.5 inches)
	42.0 mm (1.654 inches)
	54.7 mm (2.154 inches)
Specimen length:	twice the diameter
Wetted part material:	stainless steel
Connections:	1/8 inch

TEST RESULT



floXlab **Compression test result sheet**

Experimental records

	Stress (Mpa)	Axial Strain Microstrain	Radial Strain Microstrain
01/03/2018 14:51	16,319	1,4	0
01/03/2018 14:51	17,005	17,9	-0,3
01/03/2018 14:51	17,85	43,4	0
01/03/2018 14:51	19,208	85,3	0
01/03/2018 14:51	20,901	146,4	0,6
01/03/2018 14:51	22,418	216,8	-0,3
01/03/2018 14:51	24,077	295,7	0
01/03/2018 14:52	25,503	365,6	-0,6
01/03/2018 14:52	26,669	418,9	-0,3
01/03/2018 14:52	27,925	481,2	0
01/03/2018 14:52	28,975	530,7	0
01/03/2018 14:52	30,012	580,7	-10,9
01/03/2018 14:52	31,244	638,5	-9,7
01/03/2018 14:52	32,288	689,6	-10,9
01/03/2018 14:52	33,483	746,1	-13,6
01/03/2018 14:52	34,74	804,1	-22,9
01/03/2018 14:52	35,758	854,1	-24,6
01/03/2018 14:53	36,95	909,8	-27,8
01/03/2018 14:53	37,942	957,5	-28,5
01/03/2018 14:53	39,028	1006,2	-50,3
01/03/2018 14:53	40,226	1063,6	-50,9
01/03/2018 14:53	41,301	1111,9	-63,7
01/03/2018 14:53	42,506	1168,7	-76,1
01/03/2018 14:53	43,74	1226,3	-92,3
01/03/2018 14:53	44,754	1272,8	-101,5
01/03/2018 14:53	45,998	1329,7	-117,7
01/03/2018 14:53	47,003	1376,7	-129
01/03/2018 14:54	48,31	1435,3	-144,1
01/03/2018 14:54	49,558	1490,6	-155,1
01/03/2018 14:54	50,609	1538,6	-170,8
01/03/2018 14:54	51,799	1596,3	-195,3
01/03/2018 14:54	52,868	1641,3	-208,1
01/03/2018 14:54	54,106	1699,3	-222,7
01/03/2018 14:54	55,352	1754,6	-234,7
01/03/2018 14:54	56,428	1802,3	-251,6
01/03/2018 14:54	57,678	1859,7	-274,7
01/03/2018 14:55	58,742	1907,3	-287,6
01/03/2018 14:55	59,964	1962,5	-301,9
01/03/2018 14:55	61,241	2020,1	-328,7
01/03/2018 14:55	62,313	2067,4	-336,5
01/03/2018 14:55	63,568	2123,2	-362,7
01/03/2018 14:55	64,816	2180,9	-378,8
01/03/2018 14:55	65,855	2227,1	-394,2
01/03/2018 14:55	67,096	2283,8	-414,2
01/03/2018 14:55	68,136	2331,5	-424,6
01/03/2018 14:55	69,43	2387,2	-452,2
01/03/2018 14:56	70,642	2445,8	-472,1
01/03/2018 14:56	71,732	2492,2	-496,2
01/03/2018 14:56	72,954	2547,7	-511,9
01/03/2018 14:56	74,195	2606,2	-534,3

Experimental data

Time increment 5,000 s
Ramp speed 500,000 microstrain/min
Confining (0 to skip) 1000,000 psi
Regulation mode :
Break detection :

Results :

Young Modulus 21,577 Gpa
UCS (measured) 214,082 Mpa (simulated) 220,331 Mpa
Strain at UCS 9863,600 Microstrain max detected 0
Poisson Ratio 0,302

Stress vs strain curve

d/dt negative
expected strain at max stress
max stress (interpolated)

Forecast : Strain at UCS : 11027,505 ustrain UCS : 220,331 Mpa

Mohr circle calculations

	test1	test2	test3
σ1 (Mpa)	200	280	380
σ3 (Mpa)	120	180	250

	a	b
eq enveloppe y=ax+b	0,341862876071	28,85236

Cohesion coefficient	28,85236340053	Mpa
Angle of internal frixion	18,87365376171	degree

27 Rue du Port - 92022 Nanterre

France

www.floxlab.com