

SAND ANALYSIS REPORT

HOW MUCH ARE YOU PAYING FOR SAND?

This is a practical analysis of particles from this well...
 and how it may be affecting your pump.

It is not how much sand is in the fluid that causes damage to the pump,
 it is the size of the abrasive particles that flow between the barrel and plunger.

Conversion Chart
 Standard Screen to Inch to Micron

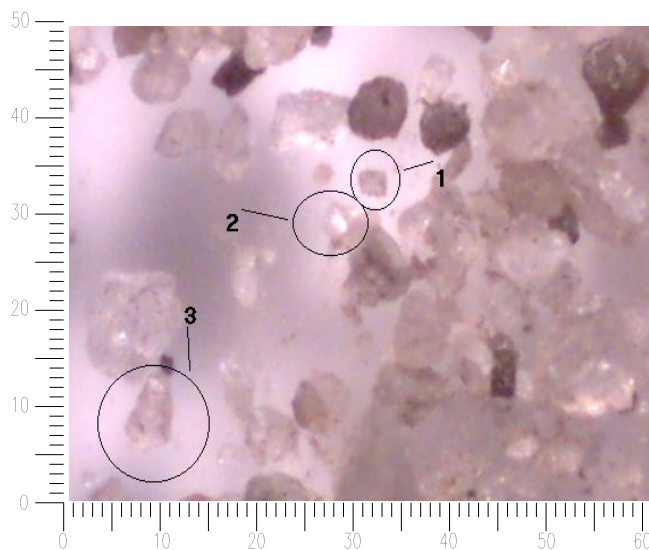
US & ASTM Std. Sieve No. (Meshes)	Equivalent Opening		
	Inches	MM	Microns
20	0.0331	0.841	841
30	0.0234	0.595	595
40	0.0165	0.420	420
50	0.0117	0.297	297
60	0.0098	0.250	250
70	0.0083	0.210	210
80	0.0070	0.177	177
100	0.0059	0.149	149
120	0.0049	0.125	125
140	0.0041	0.105	105
170	0.0035	0.088	88
200	0.0029	0.074	74
240	0.0025	0.063	63
270	0.0021	0.053	53
400	0.0015	0.037	37
550	0.0010	0.025	25
800	0.0006	0.015	15
1250	0.0004	0.010	10
-----	0.0002	0.005	5
-----	0.00006	0.002	2

Typical Proppant (Frac Sand)

Table Salt

Typical Pump Plunger/Barrel Tolerance

PG Cartridge Control Point



PHOTOMICROGRAPH OF PARTICLES
 30X ENLARGEMENT

READING THE PHOTOMICROGRAPH SCALE:
 1 DIVISION REPRESENTS 50 MICRONS (OR)
 1 DIVISION REPRESENTS 2 THOUSANDTHS OF AN INCH

TEST NUMBER: R011005-1 AREA: California DATE: 11-OCT-01

COMPANY: _____ LOCATION: Fillmore, CA

WELL NAME AND NUMBER: _____ STREN REP: _____

(1) SIZE OF PARTICLES: (#1) 130 (#2) 125 x 150 (#3) 200 x 330

(2) TYPE OF PARTICLES: (#1) Sharp Fragment (#2) Silica Fragment (#3) Nodular Silica

(3) BBLS/DAY: _____ (4) % WATER CUT: _____ (5) API GRAVITY: _____ (6) DEPTH PERFS: _____

(7) ACTUAL DAYS PUMPED BETWEEN REPAIRS: _____ (8) AVERAGE COST TO REPAIR PUMP: _____

(9) REMARKS: Sharp face, highly fragmented silica sands exceed 50% fractionally. Balance, nodular grains. Broad PSD of clean sharp sands. Significant fraction in the 50-250 micron range most aggressive to sand cutting rod pump plunger- barrel interface.

100 micron rating is recommended for control.
