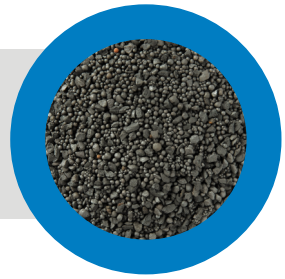
SinterBall Lock Bauxite



TECHNICAL DATA SHEET

PROPPANTS TECHNICAL DATA

CURIMBABA PROPPANTS

SinterBall Lock Bauxite is a high strength bauxite proppant used around the world for high-temperature, high closure stress environments where proppant flowback is expected. SinterBall Lock is a blend of a small percentage of angular bauxite grains with the spherical grains of SinterBall Bauxite. The purpose of the angular grains is to provide a mechanical process to prevent the flowback of proppant grains as the well is produced. With SinterBall Lock there is no chemical reaction required, and no dependence on temperature or time for the Lock to be effective. To ensure accuray and homogeneity the blend is accomplished during manufacturing thefore no blend is necessary in the field. SinterBall Lock is property of Mineração Curimbaba and it's manufactured in Poços de Caldas, Minas Gerais, Brazil.

		HSP								
		16/30			20/40			30/60		
Properties	Sieves	R 1	R 1.5	R 2	R 1	R 1.5	R 2	R 1	R 2	R 3
		% Retained			% Retained			% Retained		
Sieve Analysis	# 18	18	17	26						
	# 20	66	56	53	4	3	3			
	# 25	13	17	17	36	32	34			
	# 30	3	6	2	39	37	35			
	# 35				19	24	24			
	# 40		4	2	2	3	3	41	42	42
	# 50					1	1	46	45	45
	# 60							9	9	9
	# 70							3	3	3
	# 100							1	1	1
	Fines	0	0	0	0	0	0	0	0	0
Mean Diameter	mm	0.927	0.899	0.934	0.690	0.670	0.676	0.411	0.413	0.414
Spherecity & Roundness	-	0.85x0.85								
Bulk Density	g/cm³	1.90								
	lb/ft³	119								
Apparent Density	g/cm³	3.60								
Absolute Density	g/cm³	3.67								
Turbidity	FTU	122								
Acid Solubility	%	6.1								
Crush Resistence Stress psi, % fines	12,500	9.7	13.9	15.8	5.6	5.5	8.9	4.1	5.8	8.0
Chemical Composition, %	Al_2O_3	73.7								
	Fe_2O_3	14.8								
	SiO_2	6.4								
	TiO_2	1.9								
	Other	3.2								

Typical data measured in accordance with ISO 13503-2 and 13503-5

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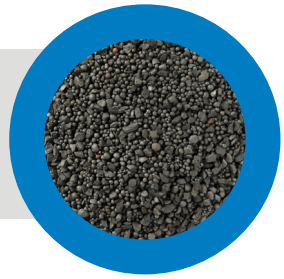
SinterBall Lock Bauxite



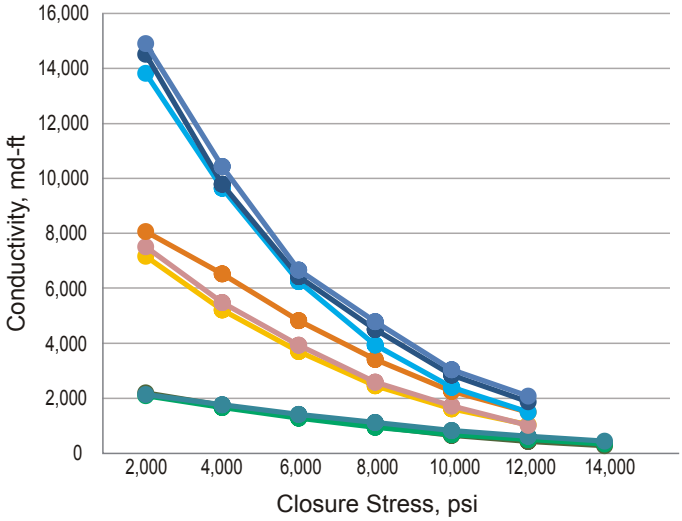
TECHNICAL DATA SHEET

PROPPANTS TECHNICAL DATA

CURIMBABA PROPPANTS

SinterBall Lock - Conductivity

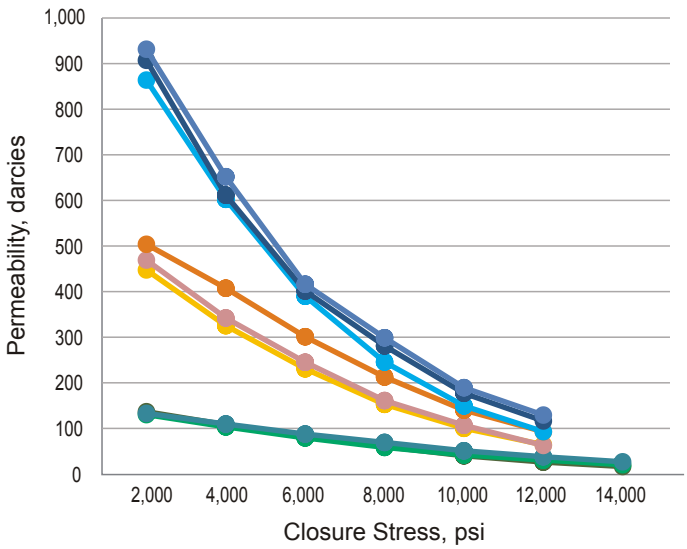
md-ft - 2% KCl - 2lb/ft² @250° F



	2,000	4,000	6,000	8,000	10,000	12,000	14,000
16/30 R1	14,448	10,117	6,466	4,647	2,952	2,022	-
16/30 R1.5	14,071	9,492	6,235	4,371	2,763	1,822	-
16/30 R2	13,400	9,350	6,059	3,825	2,334	1,459	-
20/40 R1	7,823	6,331	4,682	3,316	2,191	1,457	-
20/40 R1.5	7,286	5,320	3,817	2,515	1,676	990	-
20/40 R2	6,951	5,059	3,594	2,387	1,573	1,015	-
30/60 R1	2,080	1,718	1,377	1,093	809	607	435
30/60 R2	2,037	1,621	1,246	924	668	494	335
30/60 R3	2,137	1,695	1,286	952	640	426	274

SinterBall Lock - Permeability

darcies, 2% KCl - 2lb/ft² @ 250° F



	2,000	4,000	6,000	8,000	10,000	12,000	14,000
16/30 R1	893	649	432	322	211	148	-
16/30 R1.5	868	607	414	301	197	133	-
16/30 R2	827	605	406	266	169	108	-
20/40 R1	491	411	313	229	156	107	-
20/40 R1.5	457	344	253	173	119	72.7	-
20/40 R2	434	327	239	164	112	74.4	-
30/60 R1	131	114	95	79	60	48	36
30/60 R2	129	109	89	68	51	40	28
30/60 R3	132	111	88	67	47	33	22

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