



PRODUCT INFORMATION

OHIO GOLD FRAC SAND PLANT: THOMPSON, OH



R.W. Sidley's operates a state of the art processing plant that produces the highest quality products virtually free of deleterious materials. Our processed silica frac sand is from our Thompson mine part of the Sharon conglomerate formation. All silica frac sands are washed, dried and screened at the Thompson plant. The sands meet ISO 13503-2/ API RP19C specifications for frac sand.

Available packaging: bulk quantities

LABORATORY SIEVE ANALYSIS						
Product	12/20	16/30	20/40	30/50	40/70	70/140, 100 Mesh
U.S. SIEVE Mesh Size	Weight % Retained					
4						
6						
8	0%					
10						
12	3%	0%				
14	21%					
16	24%	0%	0%			
18	30%	3%				
20	17%	46%	2%	0%		
25		43%	18%			
30	4%	7%	30%	0%	0%	
35			34%	7%		
40		1%	11%	49%	1%	
45				30%	16%	
50			4%	9%	32%	
60					36%	
70				4%	12%	
80						
100					3%	
120						
140						
200						
Pan	0%	0%	1%	0%	0%	
% In Size (≥90.0%)	92%	96%	94%	96%	96%	
Proppant Sphericity (≥.06)*	0.6		0.7	0.6	0.6	
Proppant Roundness (≥.06)*	0.6		0.6	0.6	0.6	
Proppant Crush-Resistance Test**	11.1%		9.9%	4.3%	12.9%	
Proppant Bulk Density****	1.48 g/cm ³ 92.4 lb/ft ³		1.41 g/cm ³ 92.4 lb/ft ³		1.40 g/cm ³ 87.4 lb/ft ³	
Turbidity*****	≤ 250 FTU		≤ 250 FTU		≤ 250 FTU	
Meets API Size Spec	Yes	Yes	Yes	Yes	Yes	

* Procedure: ISO 13503-2/API RP 19C, Section 7 - Krumbein Shape Factor
 Recommended Sphericity and Roundness for proppants = 0.6 or greater (ISO/DIS 13503-2/Amd. 1/API RP19C)
 Recommended Sphericity and Roundness for high strength proppants = 0.6 or greater (ISO/DIS 13503-2/Amd. 1/API RP19C)
 ** Procedure: ISO 13503-2/API RP 19C, Section 11
 Suggested maximum fines per API RP-56: 12/20 = 16% @ 3000psi, 20/40 = 14% @ 4000psi, 30/50 = 10% @ 4000psi, 40/70 = 8% @ 5000psi
 *** Procedure: ISO 13503-2/API RP 19C, Section 10
 **** Procedure: ISO 13503-2/API RP 19C, Section 9

PHYSICAL ANALYSIS	
Silica	
Percent Loss, Sodium Sulfate Soundness (ASTM C88)	0.3%
Percent Loss, Acid Solubility (ASTM D3042)	0.3%
Moh's Hardness	7
Deleterious Substances	0
Coal, Lignite	0
Clay Lumps	0
Shale, Shaly Material	0
Limonitic Concretions	0
Chert	0
Soft Pieces	0
Metallic Particles	0

CHEMICAL ANALYSIS		
Tests	Results/Units	Methods
Fe ₂ O ₃	0.067%	ICP
Na ₂ O	0.007%	DC ARC
SiO ₂	99.70%	By Difference after impurities scan
TAO	<0.10%	DC ARC

Testing: Results are typical for the products.
 Laboratory Sieve Analysis: API testing was conducted at STIM-LAB, Inc. Duncan, OK. The procedures followed are as stated in ISO 13503-2/API RP 19C and Sieve Analysis testing was conducted at R.W. Sidley, Inc., Thompson, OH.
 Physical Analysis: Testing conducted by Solar Testing Laboratories, Inc., Brooklyn Heights, OH.
 Chemical Analysis: Testing conducted by NSL Analytical, Cleveland, OH.

Revised: 11.5.12



PRODUCT INFORMATION

OHIO GOLD FRAC SAND
PRODUCT: 12/20
PLANT: THOMPSON, OH



R.W. Sidley's operates a state of the art processing plant that produces the highest quality products virtually free of deleterious materials. Our processed silica frac sand is from our Thompson mine part of the Sharon conglomerate formation. All silica frac sands are washed, dried and screened at the Thompson plant. The sands meet ISO 13503-2/ API RP19C specifications for frac sand.

Available packaging: bulk quantities

LABORATORY SIEVE ANALYSIS						
API Control Screens	Product	12/20				
	U.S. SIEVE Mesh Size	% Retained	Cumulative % Retained	Cumulative % Passing	API Spec	Actual In/Out of Range
First Sieve	8	0%	0%	100%	≤ .1%	0%
First Primary	12	3%	3%	97%	≥ 90% ≤ 10%	92% 8%
	14	21%	24%	76%		
	16	24%	49%	51%		
	18	30%	79%	22%		
Second Primary	20	17%	95%	5%		
Last Sieve	30	4%	100%	0%		
	Pan	0%	100%	0%	≤ 1.0%	0%
% In Size (≥90.0%)		92%				
% Out of Range (≤ 10%)		8%				
Proppant Sphericity (≥.06)*		0.6				
Proppant Roundness (≥.06)*		0.6				
Proppant Crush-Resistance Test**		11.1%, Suggested maximum fines per API RP-56: 12/20 = 16% @ 3000psi.				
Proppant Bulk Density***		1.48 g/cm ³ 92.4 lb/ft ³				
Turbidity****		≤ 250 FTU				
Meets API Size Spec		Yes				

* Procedure: ISO 13503-2/API RP 19C, Section 7 - Krumbein Shape Factor
 Recommended Sphericity and Roundness for proppants = 0.6 or greater (ISO/DIS 13503-2/Amd. 1/API RP19C)
 Recommended Sphericity and Roundness for high strength proppants = 0.6 or greater (ISO/DIS 13503-2/Amd. 1/API RP19C)

** Procedure: ISO 13503-2/API RP 19C, Section 11
 Suggested maximum fines per API RP-56: 12/20 = 16% @ 3000psi

*** Procedure: ISO 13503-2/API RP 19C, Section 10

**** Procedure: ISO 13503-2/API RP 19C, Section 9



PHYSICAL ANALYSIS	
Silica	
Percent Loss, Sodium Sulfate Soundness (ASTM C88)	0.3%
Percent Loss, Acid Solubility (ASTM D3042)	0.3%
Moh's Hardness	7
Deleterious Substances	0
Coal, Lignite	0
Clay Lumps	0
Shale, Shaly Material	0
Limonitic Concretions	0
Chert	0
Soft Pieces	0
Metallic Particles	0

CHEMICAL ANALYSIS		
Tests	Results/Units	Methods
Fe ₂ O ₃	0.067%	ICP
Na ₂ O	0.007%	DC ARC
SiO ₂	99.70%	By Difference after impurities scan
TAO	<0.10%	DC ARC

Testing: Results are typical for the products.
 Laboratory Sieve Analysis: API testing was conducted at STIM-LAB, Inc. Duncan, OK. The procedures followed are as stated in ISO 13503-2/API RP 19C and Sieve Analysis testing was conducted at R.W. Sidley, Inc., Thompson, OH.
 Physical Analysis: Testing conducted by Solar Testing Laboratories, Inc., Brooklyn Heights, OH.
 Chemical Analysis: Testing conducted by NSL Analytical, Cleveland, OH.

Revised: 11.5.12



PRODUCT INFORMATION

OHIO GOLD FRAC SAND
PRODUCT: 16/30
PLANT: THOMPSON, OH



R.W. Sidley's operates a state of the art processing plant that produces the highest quality products virtually free of deleterious materials. Our processed silica frac sand is from our Thompson mine part of the Sharon conglomerate formation. All silica frac sands are washed, dried and screened at the Thompson plant. The sands meet ISO 13503-2/ API RP19C specifications for frac sand.

Available packaging: bulk quantities

LABORATORY SIEVE ANALYSIS						
API Control Screens	Product	16/30				
	U.S. SIEVE Mesh Size	% Retained	Cumulative % Retained	Cumulative % Passing	API Spec	Actual In/Out of Range
First Sieve	12	0%	0%	100%	≤ .1%	0%
First Primary	16	0%	0%	100%	≥ 90% ≤ 10%	96% 4%
	18	3%	4%	96%		
	20	46%	46%	54%		
	25	43%	89%	11%		
Second Primary	30	7%	96%	4%		
Last Sieve	40	1%	97%	3%		
	Pan	0%	97%	3%	≤ 1.0%	0%
% In Size (≥90.0%)		96%				
% Out of Range (≤ 10%)		4%				
Proppant Sphericity (≥.06)*						
Proppant Roundness (≥.06)*						
Proppant Crush-Resistance Test**						
Proppant Bulk Density***						
Turbidity****						
Meets API Size Spec		Yes				

* Procedure: ISO 13503-2/API RP 19C, Section 7 - Krumbein Shape Factor
 Recommended Sphericity and Roundness for proppants = 0.6 or greater (ISO/DIS 13503-2/Amd. 1/API RP19C)
 Recommended Sphericity and Roundness for high strength proppants = 0.6 or greater (ISO/DIS 13503-2/Amd. 1/API RP19C)

** Procedure: ISO 13503-2/API RP 19C, Section 11
 Suggested maximum fines per API RP-56: 12/20 = 16% @ 3000psi, 20/40 = 14% @ 4000psi, 30/50 = 10% @ 4000psi, 40/70 = 8% @ 5000psi

*** Procedure: ISO 13503-2/API RP 19C, Section 10

**** Procedure: ISO 13503-2/API RP 19C, Section 9



PHYSICAL ANALYSIS	
Silica	
Percent Loss, Sodium Sulfate Soundness (ASTM C88)	0.3%
Percent Loss, Acid Solubility (ASTM D3042)	0.3%
Moh's Hardness	7
Deleterious Substances	0
Coal, Lignite	0
Clay Lumps	0
Shale, Shaly Material	0
Limonitic Concretions	0
Chert	0
Soft Pieces	0
Metallic Particles	0

CHEMICAL ANALYSIS		
Tests	Results/Units	Methods
Fe ₂ O ₃	0.067%	ICP
Na ₂ O	0.007%	DC ARC
SiO ₂	99.70%	By Difference after impurities scan
TAO	<0.10%	DC ARC

Testing: Results are typical for the products.

Laboratory Sieve Analysis: API testing was conducted at STIM-LAB, Inc. Duncan, OK. The procedures followed are as stated in ISO 13503-2/API RP 19C and Sieve Analysis testing was conducted at R.W. Sidley, Inc., Thompson, OH.

Physical Analysis: Testing conducted by Solar Testing Laboratories, Inc., Brooklyn Heights, OH.

Chemical Analysis: Testing conducted by NSL Analytical, Cleveland, OH.



PRODUCT INFORMATION

OHIO GOLD FRAC SAND
PRODUCT: 20/40
PLANT: THOMPSON, OH



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Available packaging: bulk quantities

LABORATORY SIEVE ANALYSIS								
API Control Screens	Product	20/40						
	U.S. SIEVE Mesh Size	% Retained	Cumulative % Retained	Cumulative % Passing	API Spec		Actual In/Out of Range	
First Sieve	16	0%	0%	100%	≤ .1%		0%	
First Primary	20	2%	2%	98%	≥ 90%	≤ 10%	94%	6%
	25	18%	20%	80%				
	30	30%	50%	50%				
	35	34%	84%	16%				
Second Primary	40	11%	96%	4%				
Last Sieve	50	4%	99%	1%				
	Pan	1%	100%	0%	≤ 1.0%		1%	
% In Size (≥90.0%)		94%						
% Out of Range (≤ 10%)		6%						
Proppant Sphericity (≥.06)*		0.7						
Proppant Roundness (≥.06)*		0.6						
Proppant Crush-Resistance Test**		9.9%, Suggested maximum fines per API RP-56: 20/40 = 14% @ 4000psi.						
Proppant Bulk Density***		1.41 g/cm ³ 92.4 lb/ft ³						
Turbidity****		≤ 250 FTU						
Meets API Size Spec		Yes						
<p>* Procedure: ISO 13503-2/API RP 19C, Section 7 - Krumbain Shape Factor Recommended Sphericity and Roundness for proppants = 0.6 or greater (ISO/DIS 13503-2/Amd. 1/API RP19C) Recommended Sphericity and Roundness for high strength proppants = 0.6 or greater (ISO/DIS 13503-2/Amd. 1/API RP19C)</p> <p>** Procedure: ISO 13503-2/API RP 19C, Section 11 Suggested maximum fines per API RP-56: 20/40 = 14% @ 4000psi</p> <p>*** Procedure: ISO 13503-2/API RP 19C, Section 10</p> <p>**** Procedure: ISO 13503-2/API RP 19C, Section 9</p>								



PHYSICAL ANALYSIS	
Silica	
Percent Loss, Sodium Sulfate Soundness (ASTM C88)	0.3%
Percent Loss, Acid Solubility (ASTM D3042)	0.3%
Moh's Hardness	7
Deleterious Substances	0
Coal, Lignite	0
Clay Lumps	0
Shale, Shaly Material	0
Limonitic Concretions	0
Chert	0
Soft Pieces	0
Metallic Particles	0

CHEMICAL ANALYSIS		
Tests	Results/Units	Methods
Fe ₂ O ₃	0.067%	ICP
Na ₂ O	0.007%	DC ARC
SiO ₂	99.70%	By Difference after impurities scan
TAO	<0.10%	DC ARC

Testing: Results are typical for the products.
 Laboratory Sieve Analysis: API testing was conducted at STIM-LAB, Inc. Duncan, OK. The procedures followed are as stated in ISO 13503-2/API RP 19C and Sieve Analysis testing was conducted at R.W. Sidley, Inc., Thompson, OH.
 Physical Analysis: Testing conducted by Solar Testing Laboratories, Inc., Brooklyn Heights, OH.
 Chemical Analysis: Testing conducted by NSL Analytical, Cleveland, OH.

Revised: 11.5.12



PRODUCT INFORMATION

OHIO GOLD FRAC SAND
PRODUCT: 30/50
PLANT: THOMPSON, OH



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Available packaging: bulk quantities

LABORATORY SIEVE ANALYSIS						
API Control Screens	Product	30/50				
	U.S. SIEVE Mesh Size	% Retained	Cumulative % Retained	Cumulative % Passing	API Spec	Actual In/Out of Range
First Sieve	20	0%	0%	100%	≤ .1%	0%
First Primary	30	0%	0%	100%	≥ 90% ≤ 10%	96% 4%
	35	7%	8%	92%		
	40	49%	57%	43%		
	45	30%	87%	13%		
Second Primary	50	9%	96%	4%		
Last Sieve	70	4%	100%	0%		
	Pan	0%	100%	0%	≤ 1.0%	0%
% In Size (≥90.0%)		96%				
% Out of Range (≤ 10%)		4%				
Proppant Sphericity (≥.06)*		0.6				
Proppant Roundness (≥.06)*		0.6				
Proppant Crush-Resistance Test**		4.3%, Suggested maximum fines per API RP-56: 30/50 = 10% @ 4000psi.				
Proppant Bulk Density***		1.40 g/cm ³ 87.4 lb/ft ³				
Turbidity****		≤ 250 FTU				
Meets API Size Spec		Yes				

* Procedure: ISO 13503-2/API RP 19C, Section 7 - Krumbein Shape Factor
 Recommended Sphericity and Roundness for proppants = 0.6 or greater (ISO/DIS 13503-2/Amd. 1/API RP19C)
 Recommended Sphericity and Roundness for high strength proppants = 0.6 or greater (ISO/DIS 13503-2/Amd. 1/API RP19C)

** Procedure: ISO 13503-2/API RP 19C, Section 11
 Suggested maximum fines per API RP-56: 30/50 = 10% @ 4000psi

*** Procedure: ISO 13503-2/API RP 19C, Section 10

**** Procedure: ISO 13503-2/API RP 19C, Section 9



PHYSICAL ANALYSIS	
Silica	
Percent Loss, Sodium Sulfate Soundness (ASTM C88)	0.3%
Percent Loss, Acid Solubility (ASTM D3042)	0.3%
Moh's Hardness	7
Deleterious Substances	0
Coal, Lignite	0
Clay Lumps	0
Shale, Shaly Material	0
Limonitic Concretions	0
Chert	0
Soft Pieces	0
Metallic Particles	0

CHEMICAL ANALYSIS		
Tests	Results/Units	Methods
Fe ₂ O ₃	0.067%	ICP
Na ₂ O	0.007%	DC ARC
SiO ₂	99.70%	By Difference after impurities scan
TAO	<0.10%	DC ARC

Testing: Results are typical for the products.

Laboratory Sieve Analysis: API testing was conducted at STIM-LAB, Inc. Duncan, OK. The procedures followed are as stated in ISO 13503-2/API RP 19C and Sieve Analysis testing was conducted at R.W. Sidley, Inc., Thompson, OH.

Physical Analysis: Testing conducted by Solar Testing Laboratories, Inc., Brooklyn Heights, OH.

Chemical Analysis: Testing conducted by NSL Analytical, Cleveland, OH.

Revised: 11.5.12



PRODUCT INFORMATION

OHIO GOLD FRAC SAND
PRODUCT: 40/70
PLANT: THOMPSON, OH



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Available packaging: bulk quantities

LABORATORY SIEVE ANALYSIS							
API Control Screens	Product	40/70					
	U.S. SIEVE Mesh Size	% Retained	Cumulative % Retained	Cumulative % Passing	API Spec		Actual In/Out of Range
First Sieve	30	0%	0%	100%	≤ .1%		0%
First Primary	40	1%	1%	99%	≥ 90% ≤ 10%		96% 4%
	45	16%	16%	84%			
	50	32%	48%	52%			
	60	36%	85%	15%			
Second Primary	70	12%	96%	4%			
Last Sieve	100	3%	100%	1%			
	Pan	0%	100%	0%	≤ 1.0%		0%
% In Size (≥90.0%)		96%					
% Out of Range (≤ 10%)		4%					
Proppant Sphericity (≥.06)*		0.6					
Proppant Roundness (≥.06)*		0.6					
Proppant Crush-Resistance Test**		12.9%, Suggested maximum fines per API RP-56: 40/70 = 8% @ 5000psi.					
Proppant Bulk Density***		1.37 g/cm ³ 85.5 lb/ft ³					
Turbidity****		≤ 250 FTU					
Meets API Size Spec		Yes					

* Procedure: ISO 13503-2/API RP 19C, Section 7 - Krumbein Shape Factor
 Recommended Sphericity and Roundness for proppants = 0.6 or greater (ISO/DIS 13503-2/Amd. 1/API RP19C)
 Recommended Sphericity and Roundness for high strength proppants = 0.6 or greater (ISO/DIS 13503-2/Amd. 1/API RP19C)

** Procedure: ISO 13503-2/API RP 19C, Section 11
 Suggested maximum fines per API RP-56: 40/70 = 8% @ 5000psi

*** Procedure: ISO 13503-2/API RP 19C, Section 10

**** Procedure: ISO 13503-2/API RP 19C, Section 9



PHYSICAL ANALYSIS	
Silica	
Percent Loss, Sodium Sulfate Soundness (ASTM C88)	0.3%
Percent Loss, Acid Solubility (ASTM D3042)	0.3%
Moh's Hardness	7
Deleterious Substances	0
Coal, Lignite	0
Clay Lumps	0
Shale, Shaly Material	0
Limonitic Concretions	0
Chert	0
Soft Pieces	0
Metallic Particles	0

CHEMICAL ANALYSIS		
Tests	Results/Units	Methods
Fe ₂ O ₃	0.067%	ICP
Na ₂ O	0.007%	DC ARC
SiO ₂	99.70%	By Difference after impurities scan
TAO	<0.10%	DC ARC

Testing: Results are typical for the products.

Laboratory Sieve Analysis: API testing was conducted at STIM-LAB, Inc. Duncan, OK. The procedures followed are as stated in ISO 13503-2/API RP 19C and Sieve Analysis testing was conducted at R.W. Sidley, Inc., Thompson, OH.

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