BIOTRAXX NATUR-ZEOLITH MICROFEIN

PRODUCT INFORMATION SHEET

GENERAL INFORMATION

Chemical Name:	Calcium, Potassium, Sodium Aluminosilicate	**CAS No:**	12173-10-3
Chemical Family:	Natural Zeolite	**EINECS No:**	215-283-8
Chemical Abstract Name:	Clinoptilolite		
Chemical Formula:	$(Ca,K_2,Na_2,Mg)_4Al_8Si_{40}O_{96}.24H_2O$		

MINERAL COMPOSITION *

Clinoptilolite	88 - 95 %	**Montmorillonite**	2 - 5 %	**Muscovite**	0 - 3 %
Feldspars	3 - 5 %	**Cristobalite**	0 - 2 %		

** Semi-Quantitative whole rock analysis (bulk mineralogy) has been done using powder X-ray Diffraction Method*

CHEMICAL COMPOSITION **

SiO_2	65 - 72 %	**Fe_2O_3**	0,8 - 1,9 %	**MnO**	0 - 0,08 %
Al_2O_3	10 - 12 %	**MgO**	0,9 - 1,2 %	**LOI*** **	9 - 12 %
CaO	2,5 - 3,7 %	**Na_2O**	0,3 - 0,65 %		
K_2O	2,3 - 3,5 %	**TiO_2**	0 - 0,1 %	**SiO_2/Al_2O_3**	5,4 - 6,0

*** Analysed by XRF Spectrometer*

**** Loss of Ignition*

PHYSICAL PROPERTIES

Appearance	Ivory white	**Oil Absorption (ml/100g)**	57	**Solubility**	None
Smell	None	**Abrasion (mg/100g)**	87	**Plasticity**	Minor
Porosity	45 - 50 %	**Single Point Surface Area**	39 m^2/g	**Softening Point**	1150 °C
Hardness	2 - 3 Mohs	**Micropore Area**	11 m^2/g	**Melting Point**	1300 °C
Mudding Down	None	**Mesopore Area**	29 m^2/g	**Bulk Density**	650 - 850 kg / m^3
Water Absorption	42 - 50 %	**Effective Diameter of Pores**	4 angstrom	**pH**	7,0 - 8,0

CATION EXCHANGE CAPACITY (CEC) †

Total CEC: 1,5 - 1,9 meq/g

† Methylene Blue Chloride Method

Major Exchangeable Cations

Rb, Li, K, Cs, NH4, Na, Ca, Ag, Cd, Pb, Zn, Ba, Sr, Cu, Hg, Mg, Fe, Co, Al, Cr.

(selectivity of above cations is a function of hydrated molecular size and relative concentrations).

Selectivity

$Cs^+ > NH^{4+} > Pb^{2+} > K^+ > Na^+ > Ca^{2+} > Mg^{2+} > Ba^{2+} > Cu^{2+}, Zn^{2+}$

Primary Adsorbing Gases

CO, CO2, SO2, H2S, NH3, HCHO, Ar, O2, N2, H2O, He, H2, Kr, Xe, Ch2OH, Freon, formaldehyde, and mercaptans.

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[redacted]
TÜRKEI

Person in charge Ms. Y. Knop
ASM Ms. Y. Knop

* name of company not visible

Report date 14.02.2015

Analytical report AR-15-GF-005037-01

Sample Code 710-2015-02837001

Reference	Natural Zeolite Mineral
Sample sender	[redacted]
Reception date time	09.02.2015
Transport by	DHL
Purchase order date	06.02.2015
Client sample code	[redacted] Zeolite
Packaging	plastic bag
Number of containers	1
Reception temperature	room temperature
End analysis	14.02.2015

Test results

CYP07 dry matter (°) (#)
Method EC 152/2009, , produce dry matter of original sample

dry residue	91.0	%

A7158 Dioxins and Furans: PCDD/F (17 Congeners) (°) (#)
Method EC Reg 589/2014 (food) and EC Reg 709/2014 (feed), GLS DF 100, HRMS / GC-MS/MS

2,3,7,8-TetraCDD	< 0.01	ng/kg MC12%
1,2,3,7,8-PentaCDD	< 0.02	ng/kg MC12%
1,2,3,4,7,8-HexaCDD	< 0.03	ng/kg MC12%
1,2,3,6,7,8-HexaCDD	< 0.03	ng/kg MC12%
1,2,3,7,8,9-HexaCDD	< 0.03	ng/kg MC12%
1,2,3,4,6,7,8-HeptaCDD	< 0.05	ng/kg MC12%
OctaCDD	< 0.38	ng/kg MC12%

2,3,7,8-TetraCDF	< 0.03	ng/kg MC12%
1,2,3,7,8-PentaCDF	< 0.02	ng/kg MC12%
2,3,4,7,8-PentaCDF	< 0.04	ng/kg MC12%
1,2,3,4,7,8-HexaCDF	< 0.04	ng/kg MC12%
1,2,3,6,7,8-HexaCDF	< 0.04	ng/kg MC12%
1,2,3,7,8,9-HexaCDF	< 0.03	ng/kg MC12%
2,3,4,6,7,8-HexaCDF	< 0.03	ng/kg MC12%
1,2,3,4,6,7,8-HeptaCDF	< 0.04	ng/kg MC12%
1,2,3,4,7,8,9-HeptaCDF	< 0.03	ng/kg MC12%
OctaCDF	< 0.08	ng/kg MC12%
WHO(2005)-PCDD/F TEQ (lower-bound)	ND	ng/kg MC12%
WHO(2005)-PCDD/F TEQ (upper-bound)	0.068	ng/kg MC12%

A7347 Dioxin-like PCBs (12 WHO-PCBs) (°) (#)
Method EC Reg 589/2014 (food) and EC Reg 709/2014 (feed), GLS DF 100, HRMS / GC-MS/MS

PCB 77	< 1.19	ng/kg MC12%
PCB 81	< 0.18	ng/kg MC12%
PCB 105	< 2.57	ng/kg MC12%
PCB 114	< 0.35	ng/kg MC12%
PCB 118	< 9.24	ng/kg MC12%
PCB 123	< 0.26	ng/kg MC12%
PCB 126	< 0.17	ng/kg MC12%
PCB 156	< 1.45	ng/kg MC12%
PCB 157	< 0.27	ng/kg MC12%
PCB 167	< 0.73	ng/kg MC12%
PCB 169	< 0.79	ng/kg MC12%
PCB 189	< 0.26	ng/kg MC12%
WHO(2005)-PCB TEQ (lower-bound)	ND	ng/kg MC12%
WHO(2005)-PCB TEQ (upper-bound)	0.041	ng/kg MC12%

GF004 WHO-PCDD/F+PCB TEQ (°) (#)
Method EC Reg 589/2014 (food) and EC Reg 709/2014 (feed), GLS DF 100, calculated

WHO(2005)-PCDD/F+PCB TEQ (lower-bound)	ND	ng/kg MC12%
WHO(2005)-PCDD/F+PCB TEQ (upper-bound)	0.109	ng/kg MC12%

CY010	**PCB ~ 6 ICES ~ food / feed (°) (#)**		
Method	EC Reg 589/2014 (food) and EC Reg 709/2014 (feed), GLS DF 100, HRMS / GC-MS/MS		
PCB 28		< 0.07	µg/kg MC12%
PCB 52		< 0.07	µg/kg MC12%
PCB 101		< 0.07	µg/kg MC12%
PCB 138		< 0.07	µg/kg MC12%
PCB 153		< 0.07	µg/kg MC12%
PCB 180		< 0.07	µg/kg MC12%
Total 6 ndl-PCB (lower-bound)		ND	µg/kg MC12%
Total 6 ndl-PCB (upper-bound)		0.40	µg/kg MC12%

(°) = The test was performed at the laboratory site: Am Neuländer Gewerbepark 4
(#) = Eurofins GfA Lab Service Gmbh (Hamburg) is accredited for this test.

< - Concentration below the indicated limit of quantification (LOQ)
ND - not determined since none of the corresponding congeners was above the LOQ

JUDGEMENT

According to the Commission Regulation (EU) No 277/2012 of 28 March 2012 amending Annexes I and II to Directive 2002/32/EC of the European Parliament and of the Council as regards maximum levels and action thresholds for dioxins and polychlorinated biphenyls for feed materials of mineral origin we declare:

The sum of dioxins and furans of the above mentioned sample is below the maximum level of 0.75 ng WHO-TEQ/kg relative to a feed with a moisture content of 12%.

The sum of dioxins / furans and dioxin-like PCBs of the above mentioned sample is below the maximum level of 1.0 ng WHO-TEQ/kg relative to a feed with a moisture content of 12%.

The sum of non dioxin-like PCBs of the above mentioned sample is below the maximum level of 10 µg/kg relative to a feed with a moisture content of 12%.

This electronically generated test report has been checked and approved. It is also valid without signature.

Yasmina Knop
(Analytical Services Manager)

Approved by ECOCERT INPUTS

ATTESTATION

for inputs suitable for use in Organic Farming according to (EC) n° 834/2007 & 889/2008 Regulations

Attestation reference: 1617TR1400n1e -
Number of products: 1

This attestation is issued to the operator below:

[redacted]

TURKIYE * name of company not visible

Ecocert SA confirms after inspection that the following products:

PRODUCT NAME	CATEGORY	STATUS
in accordance with Biotraxx Natur-Zeolith microfine	Soil conditioner	EU 889/2008 allowed

are suitable for use in Organic Farming according to (EC) n° 834/2007 & 889/2008 Regulations

Inputs Service Manager
Guillaume DELEIXHE

Issue date, in L'Isle Jourdain: 08/01/2015
Expiry date: 31/12/2015

This document belongs to Ecocert. It has to be returned on request.
Only the original is valid, until the expiry date of the attestation or the termination of the attestation contract.

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Physical Properties — Sample-no.: 12471

Appearance:	bright- greenish-grey
Smell:	none
Hardness (Mohs):	3
Plasticity:	none
Humidity (delivery):	10,8% (determination by drying 110°C)
Solubility in water:	none (22°C, atmospheric pressure
Reaction with HCl-solution:	none (1:1 solution with H2O, 22°C, atmospheric pressure)
pH-value:	6,5 - 7,5
Ammonium Absorption:	1,4 W.-%
Water Absorption:	36,9 W.-% (impregnation by boiling method, test specimen)
Bulk Density:	1,22 g/cm³
Open Porosity:	45,0 %
Water Absorption Capacity:	17,0 W.-% (after 1 h, test specimen stand in 1cm water)
Capillary elevation:	2,0 cm (after 1 h)
Oil Absorption:	77 ml/100g (powder < 63µm; method: ASTM D281)
Abrasion:	5,26 g/100g ; 0,5 g/cm² (test in accordance with DIN EN 1338 / DIN 52108: "Measuring of Abrasion by Method from Böhme)
Bulk density:	1,23 g/cm³ (geometrical and gravimetric, test specimen) 0,34 g/cm³ (powder, prepared <63µm by laporatory)
Real density:	2,246 g/cm³ (powder < 63µm, by He-pycnometer)
Porosity:	84,86% (from powder < 63µm)
Specific surface area (BET):	41 m²/g
Pore size distribution (BET):	Micropore Area (<2nm) 1,9 m²/g Mesopore Area (2..50nm) 28,0 m²/g Makropore Area (>50nm) 1,5 m²/g
Effective Diameter of Pores:	4 Ångstrom (0,4 nm)

The analytical results valid for the present sample material only.

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Physical Properties
Diagramms from BET measurement

Sample-no.: 12471

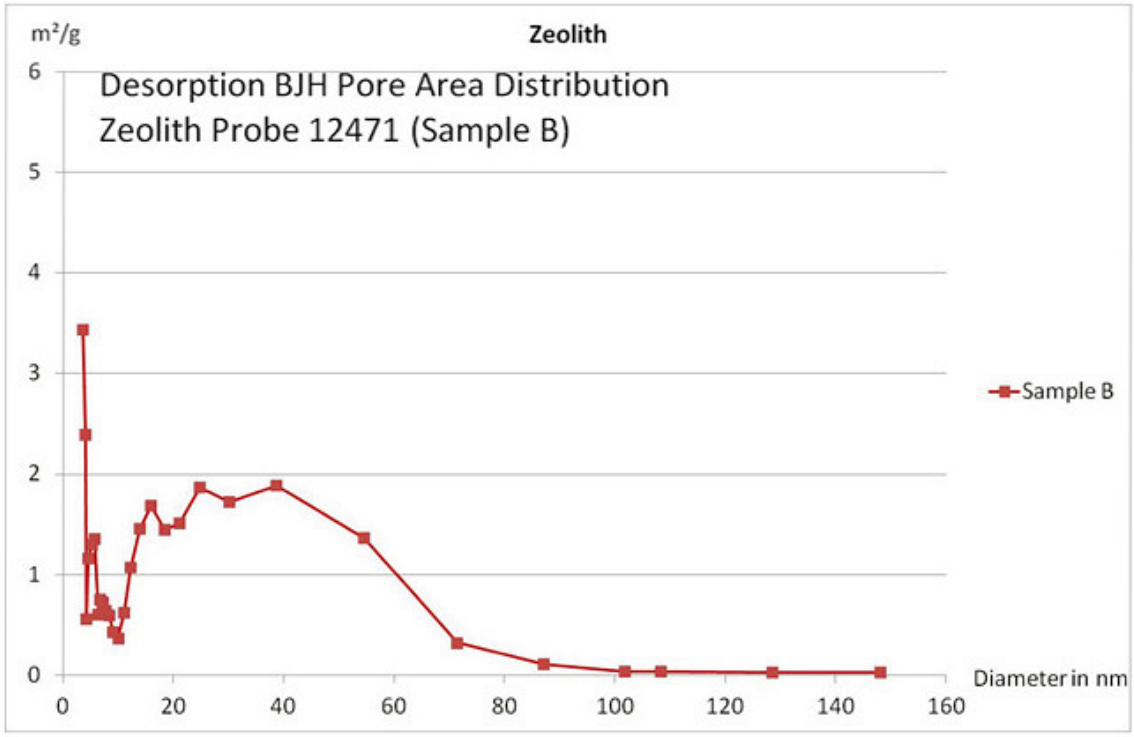


Figure 1: BET Desorptionsisotherme model BJH, distribution density of pore area

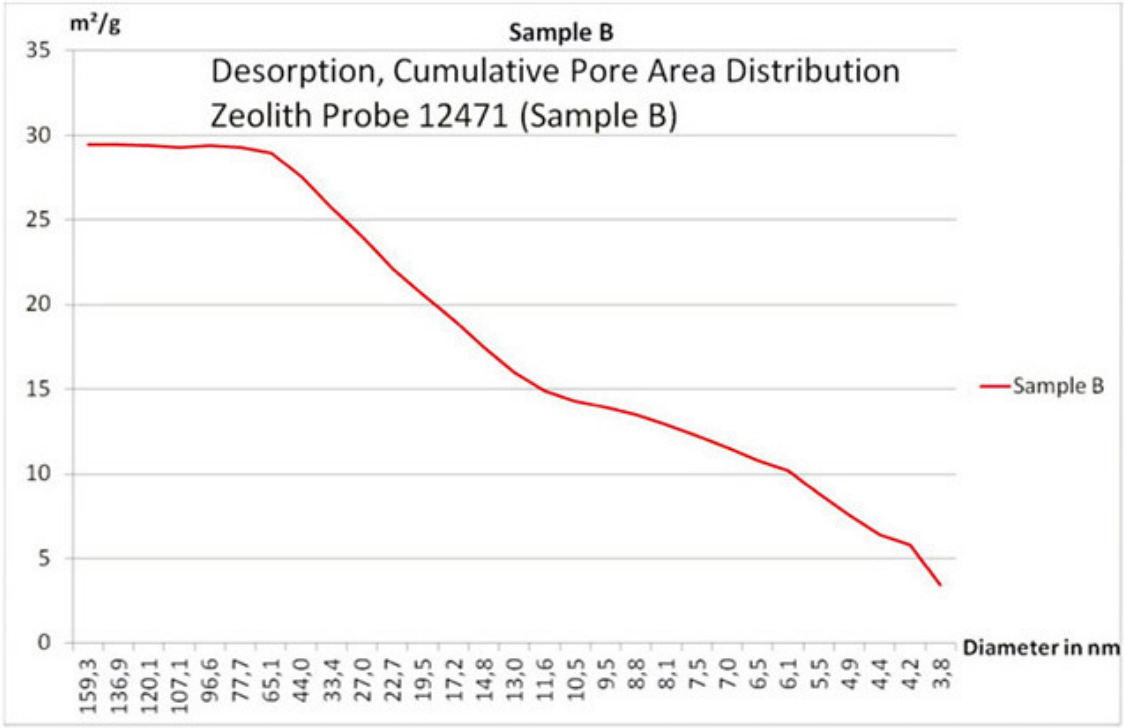
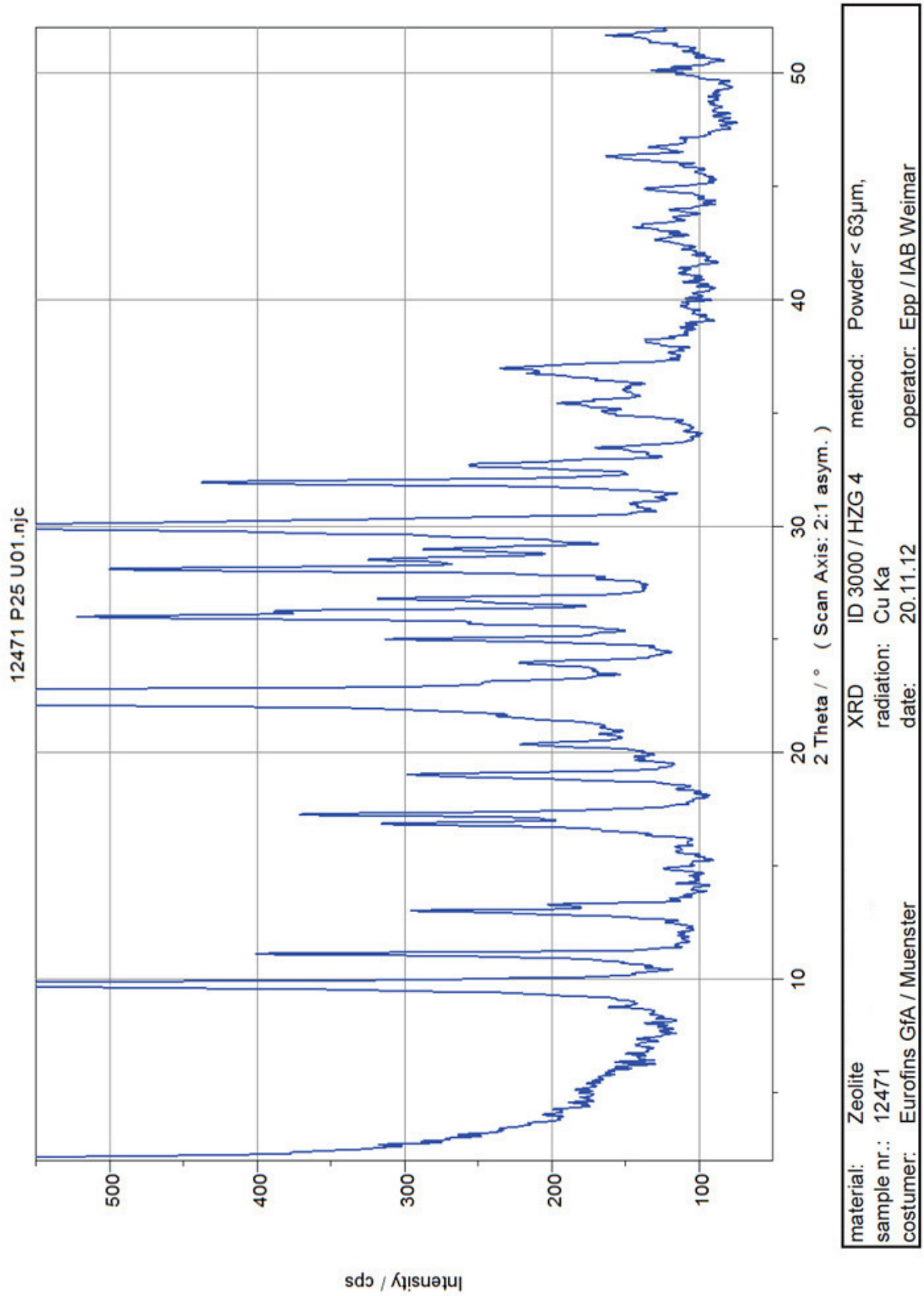


Figure 2: BET Desorptionsisotherme model BJH, distribution kumulative of pore area

x-ray-diffraction analyse **Zeolite** **sample no.:** **page**

powder pattern **12471** **A 1**

for Eurofins GfA Lab Service GmbH / Muenster



Physical Properties
Heating Microscopy

Sample-no.: **12471**

Conditions: Heating rate: 5 K/min; Holding time at 1400 °C: 6 min;
Cooling rate: 10 K/min; Medium: air; Specimen holder: Corundum

Temperature (°C)	Specimen geometry
Room temperature 30 °C	
Start sintering 756 °C	
End sintering 1061 °C	
Not start dewetting, sample start bloating 1206 °C (softening)	
Bloating 1296 °C	
Fusion point (melting) 1386 °C	
45° angle not obtainable 1400 °C End of test	

IAB - Institut für Angewandte Bauforschung Weimar gGmbH
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TH U 00

Analysis-Esan

Created by: MS3000
Last edited: 4/24/2014 11:48:20 AM

ECZACIBASI ESAN Malvern

Measurement Details

Sample Name	<40 micron Z-2 Zeolite 2145	**Measurement Date Time**	4/29/2015 4:26:46 AM
Operator Name	MS3000	**Analysis Date Time**	4/29/2015 4:26:46 AM
SOP File Name	HydroEV.cfg	**Result Source**	Edited

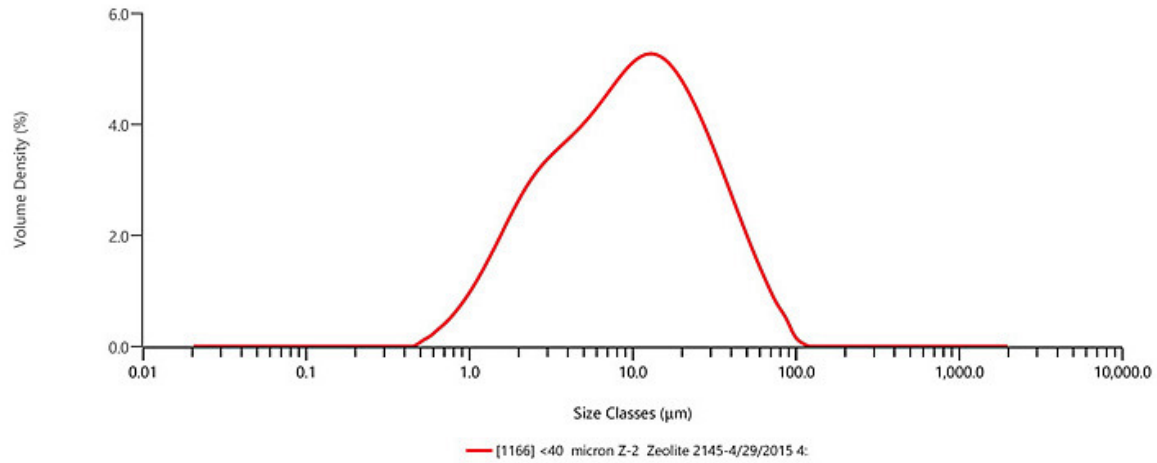
Analysis

Particle Name	Zeolite	**Particle Refractive Index**	1.503
Dispersant Name	Water	**Dispersant Refractive Index**	1.330
Particle Absorption Index	0.100	**Laser Obscuration**	12.71 %
Weighted Residual	0.10 %	**Scattering Model**	Mie
Analysis Model	General Purpose (Emulated MS2000 / MS2000E)	**Analysis Sensitivity**	Normal

Result

Concentration	0.0088 %	**Span**	3.544
Uniformity	1.108	**Result Units**	Volume
Specific Surface Area	1205 m^2/kg	**Dv (10)**	1.986 µm
D [3,2]	4.979 µm	**Dv (50)**	9.643 µm
D [4,3]	15.124 µm	**Dv (90)**	36.158 µm
		Dv (98)	64.279 µm

Frequency (compatible)



Size (µm)	% Volume Under	Size (µm)	% Volume Under	Size (µm)	% Volume Under	Size (µm)	% Volume Under	Size (µm)	% Volume Under	Size (µm)	% Volume Under
0.010	0.00	7.500	41.98	40.000	91.92	90.000	99.76	210.000	100.00	800.000	100.00
0.050	0.00	10.000	51.21	45.000	93.88	100.000	99.93	250.000	100.00	900.000	100.00
0.100	0.00	15.000	65.08	50.000	95.37	105.000	99.97	300.000	100.00	950.000	100.00
0.500	0.02	20.000	74.53	52.000	95.87	125.000	100.00	350.000	100.00	1000.000	100.00
1.000	2.07	25.000	81.13	60.000	97.40	150.000	100.00	420.000	100.00		
2.000	10.13	30.000	85.86	63.000	97.84	170.000	100.00	600.000	100.00		
2.700	15.91	32.000	87.38	74.000	98.94	180.000	100.00	700.000	100.00		
5.000	30.50	38.000	90.97	80.000	99.32	200.000	100.00	750.000	100.00		

Software Version: 3.00
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