

**Report No.:** 15210  
**Date:** 01.07.2014  
**Contact:** THA

## Task:

**Application field:** Others  
**Material:** TiO<sub>2</sub>  
**Feed size:** 0.2 - 4 µm  
**Feed quantity:** 10 g  
**Material specification(s):** dry  
**Customer requirements(s):** < 0.1 µm  
**Subsequent analysis:** not defined

## Solution

**Selected Instrument(s):** High Energy Ball Mill Emax

**Configuration(s) Item nos.:** 1 x High Energy Ball Mill Emax 200-230 V, 50/60 Hz  
2 x Grinding jar Emax zirconium oxide 50 ml  
1 x Grinding balls, zirconium oxide, ø 0.1 mm, 500 g, approx. 135 ml

Please note: Other electrical versions of the instrument(s) are available with different item numbers.

**Parameter(s):** Revolution speed 2000 rpm

**Time:** 30 min

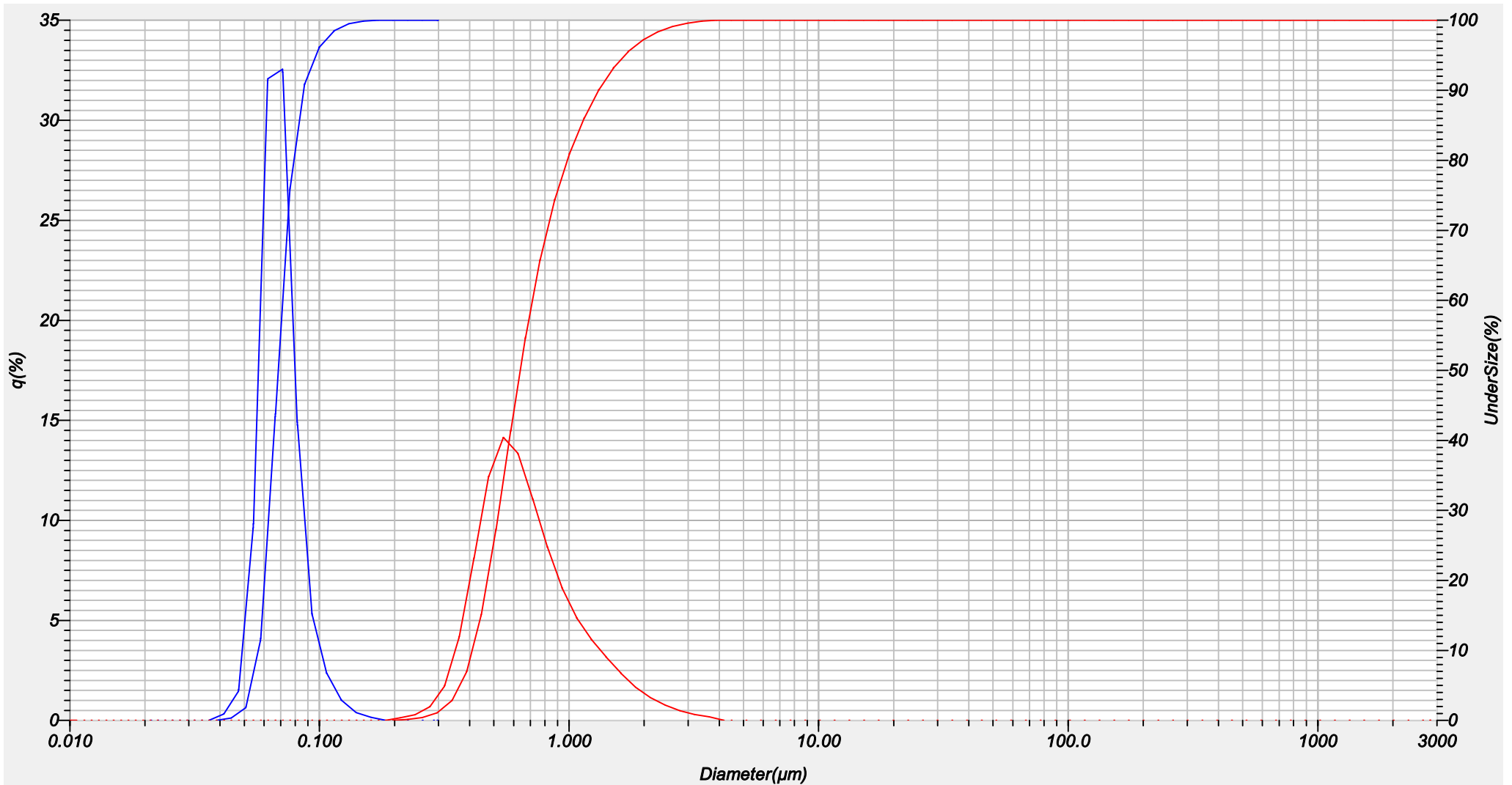
**Achieved result(s):** d<sub>90</sub> = 87 nm  
see measuring protocol HORIBA LA-960

**Remark(s):** 110 g grinding balls, 10 g TiO<sub>2</sub> and 15 ml 1% Na<sub>2</sub>P<sub>4</sub>O<sub>7</sub> are filled into the grinding jar and ground for 30 min at 2000 rpm.

**Recommendation:** The High Energy Ball Mill Emax is suitable to grind the sample material under the above mentioned conditions.



# Horiba LA-960 for Windows



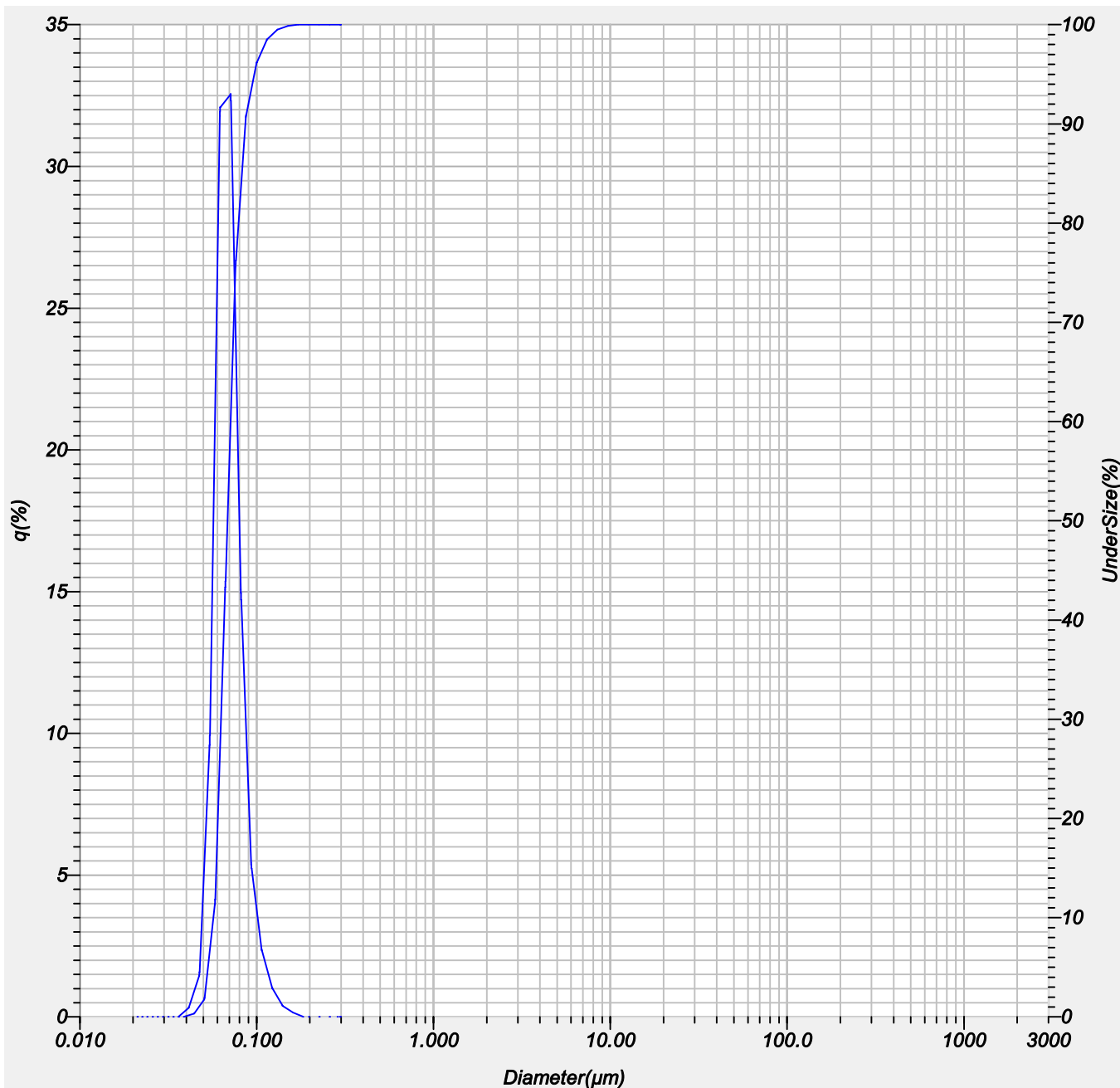
Data Name	Graph Type	Sample Name	D10	Median Size	D90
TiO2-Emax-50ml-30min-US3	—	TiO2-emax-80ml-30min	0.05696(μm)	0.06839(μm)	0.08663(μm)
TiO2-Original-US4	—	TiO2-emax-80ml-5min	0.40925(μm)	0.63791(μm)	1.31584(μm)



# Laser Scattering Particle Size Distribution Analyzer LA-960

Data Name : TiO2-Emax-50ml-30min-US3  
 Probenname : TiO2-emax-80ml-30min  
 Material : Quarz  
 ID# : 201401221528626  
 Transmittance(R) : 81.5(%)  
 Transmittance(B) : 43.7(%)  
 Circulation Speed : 7  
 Agitation Speed : 7  
 Ultra Sonic : 01:39 (7)  
 Form of Distribution : Manual  
 Distribution Base : Volume  
 Refractive Index (R) : TiO2[TiO2( 2.500 - 0.010i),Water( 1.333)]  
 Refractive Index (B) : TiO2[TiO2( 2.500 - 0.010i),Water( 1.333)]  
 Test-Nr. : R15118

D10 : 0.05696(μm)  
 Median Size : 0.06839(μm)  
 D90 : 0.08663(μm)  
 Mean Size : 0.07070(μm)  
 Std.Dev. : 0.0139(μm)  
 Geo.Mean Size : 0.0695(μm)  
 Geo.Std.Dev. : 1.1956(μm)  
 Mode Size : 0.0687(μm)



No.	Diameter(μm)	q(%)	UnderSize(%)	No.	Diameter(μm)	q(%)	UnderSize(%)	No.	Diameter(μm)	q(%)	UnderSize(%)	No.	Diameter(μm)	q(%)	UnderSize(%)
5	0.039	0.000	0.000	8	0.058	9.633	11.410	11	0.087	14.830	90.854	14	0.131	0.996	99.476
6	0.044	0.313	0.313	9	0.067	32.068	43.478	12	0.100	5.282	96.136	15	0.150	0.381	99.857
7	0.051	1.463	1.776	10	0.076	32.546	76.024	13	0.115	2.345	98.480	16	0.172	0.143	100.000