

COBRA



COBRA TECHNOLOGIES B.V.

POROUS CERAMICS

Cobra Technologies BV, Rijssen, The Netherlands

info@cobratechnologies.nl

www.cobraceramicdiscs.com



INTRODUCTION

COBRA



The Company Cobra Technologies BV

- 100% subsidiary of Pervatech BV
- 1999 Established in Enter the Netherlands
- 2014 Scale-up and re-location to Rijssen (NL)
- Long term SCAL collaboration with Laszlo Lombos and Lombos (ERGO) Associates Ltd.



Products

- High quality porous ceramics for:
 - SCAL Special Core Analysis
 - Membranes (development & support)
 - Sensors and analytical equipment
 - Other

PRODUCTS AND SERVICES

COBRA



Products

- Ceramic discs
- Hydrophobisation
- Coatings
- Dip Coaters

Product innovation

- High-low entry pressures
- Sandwich construction
- Layered construction
- Special top-layer
- Customized products

Process innovation

- Higher efficiency
- Fast draining, less waiting time for data generation
- Reliable data

Business

- Lower SCAL costs
- Consistent membrane development
- New markets for innovative products

Services

- Consultancy
- Testing
- Development

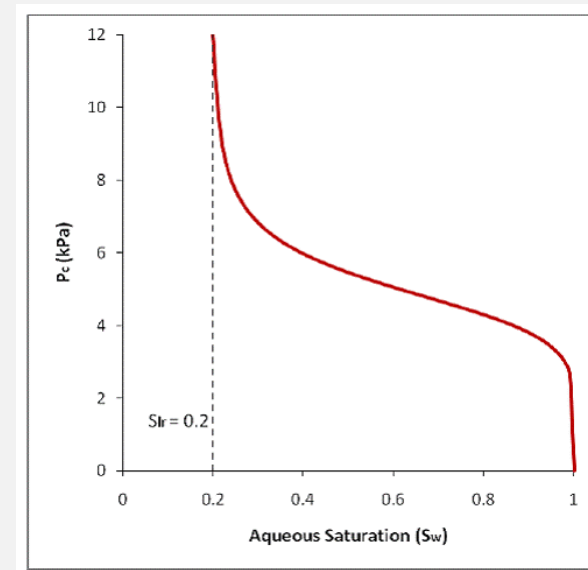
Our technologies enable customers to innovate their products and processes

(SPECIAL) CORE ANALYSIS, BASIC PRINCIPLES

COBRA



- Oil and gas industry needs to characterize the quality of fields with regards to exploration yield and Capillary pressure indication.
- Special Core Analysis (SCAL) technique :
 - Two-phase flow
 - Relative permeability
 - Capillary pressure



Very suitable to test with the high quality, narrow pore size distribution discs from Cobra Technologies BV, which are specifically designed for SCAL procedures either in water-wet or in oil-wet condition.

WHY USE COBRA CERAMICS FOR (SPECIAL) CORE ANALYSIS

COBRA



- Products with narrow pore size distribution, enabling application of conventional and unconventional analytical procedures such as very tight gas sand formations with sharp diagnostic procedure
- Due to high quality >99,9% alpha alumina intrinsically highly hydrophilic
- Possibility for rendering to oil-wet throughout the whole internal pore structure of the disc, without fractionation in wettability and risk on surface damage threatening the test results
- Suitable for I-Sw Continuous Injection Technique
- Good reproducibility
- Use of high quality pure materials, creating high chemical and temperature resistance
- Easier compliance by defined repeatable pore size and effective interconnected pore size structure for highest permeability up to the entry pressure
- Cobra offers development capabilities and flexibility
- Lower costs at the end by reproducibility and quick/ easy selection of discs

COBRA SCAL PRODUCTS

COBRA



		Entry pressure (N2/water) psi (theoretical)
Standard products	50nm	835
	80nm	507
	150nm	275
Sandwich construction (high entry pressure) (prototype)		1000-4000
Layered construction (low entry pressure) (development)		10-150

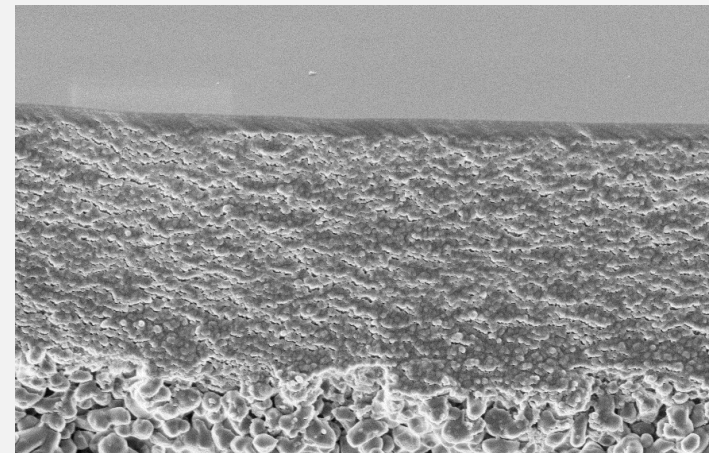
Development and manufacturing upon request for specific purposes, within the technical limitations for superior high quality.

COBRA CERAMICS FOR OTHER APPLICATIONS

COBRA



- Membrane technology
 - Uniform pore size distributions in both support and membrane layers,
 - Highly suitable for membrane (development)
 - Wide range of coating layers available with regards to material and pore sizes
 - Polishing possibilities
- Sensors & analytical equipment
 - Good reproducibility
 - Use of high quality pure materials, creating high chemical and temperature resistance
 - Used as e.g. pre-filter or humidity controller



PRODUCT INFORMATION

COBRA



- Material & specifications
- Characteristics
- Pore size distribution
- Oil-wet (hydrophobic) discs
- Sandwich construction

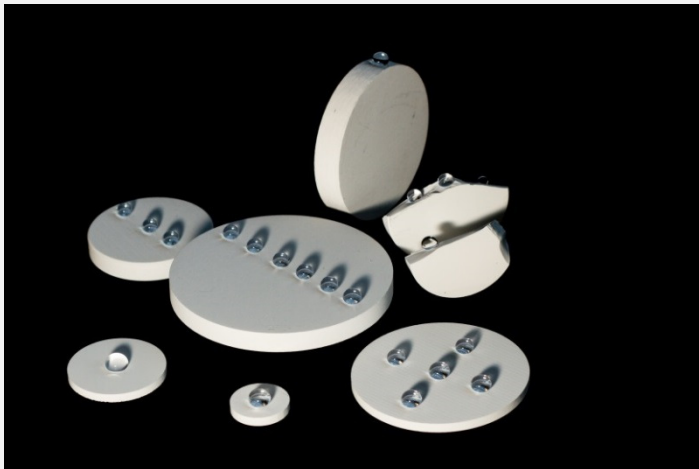


MATERIAL & SPECIFICATIONS

COBRA

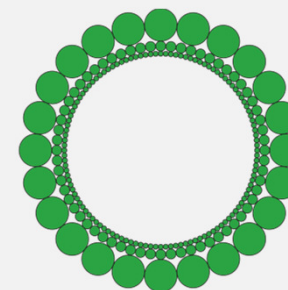


- High purity Aluminium oxide (alumina, Al_2O_3)
- Different sizes (diameter, thickness)
- Different pore sizes/ entry pressures
- Different characteristics (water-wet & oil-wet)



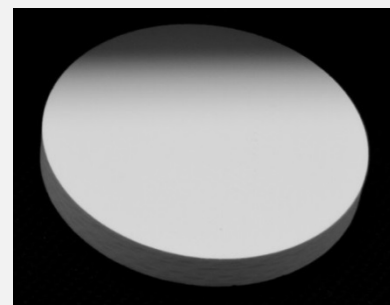
DISC CHARACTERISTICS (1)

COBRA



Diameter	13 – 101,6 mm (<4")
Thickness	2 – 7,5 mm
Polishing (option)	Ra < 0,1 μm
Standard deviations on all sizes:	+/- 0,1 mm
Pore sizes, narrow pore size distribution	50, 80 and 150 nm
Material	$\alpha\text{-Al}_2\text{O}_3$ (>99,9%)
Modifications (standard hydrophilic/ water-wet)	Hydrophobic/ oil-wet

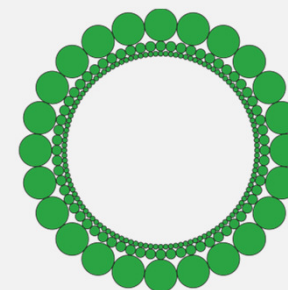
Other specifications on request.



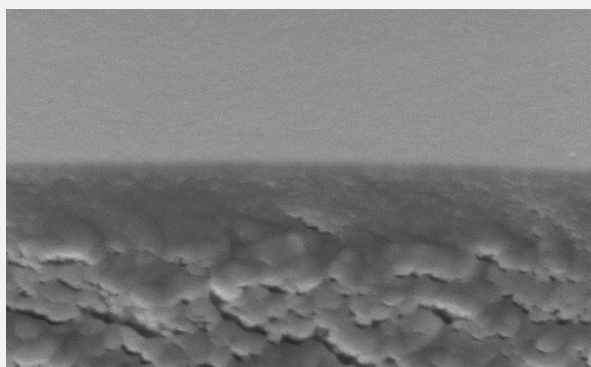
DISC CHARACTERISTICS (2)

MEMBRANE LAYERS

COBRA

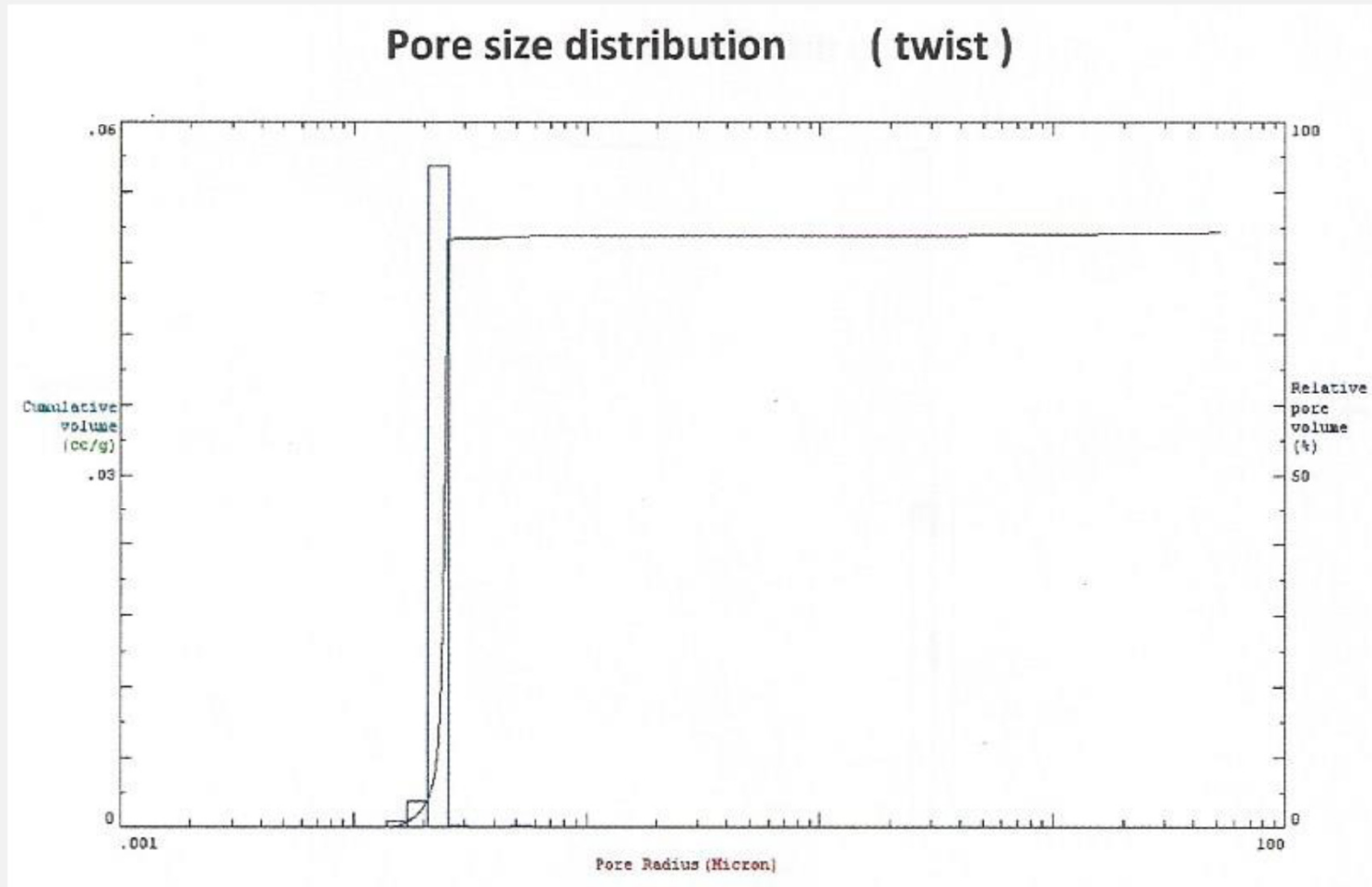
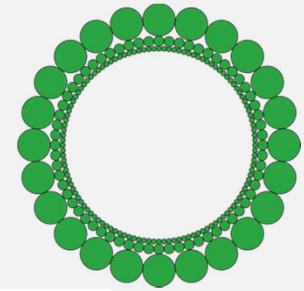


Layer	Pore size
meso-TiO ₂	3,5 – 15 nm
micro-TiO ₂	≈1,0 nm
meso-ZrO ₂	6 nm
meso-ZrO ₂	3 nm
γ-Al ₂ O ₃	3,5 – 5 nm
(hybrid) Silica	<0,5 nm



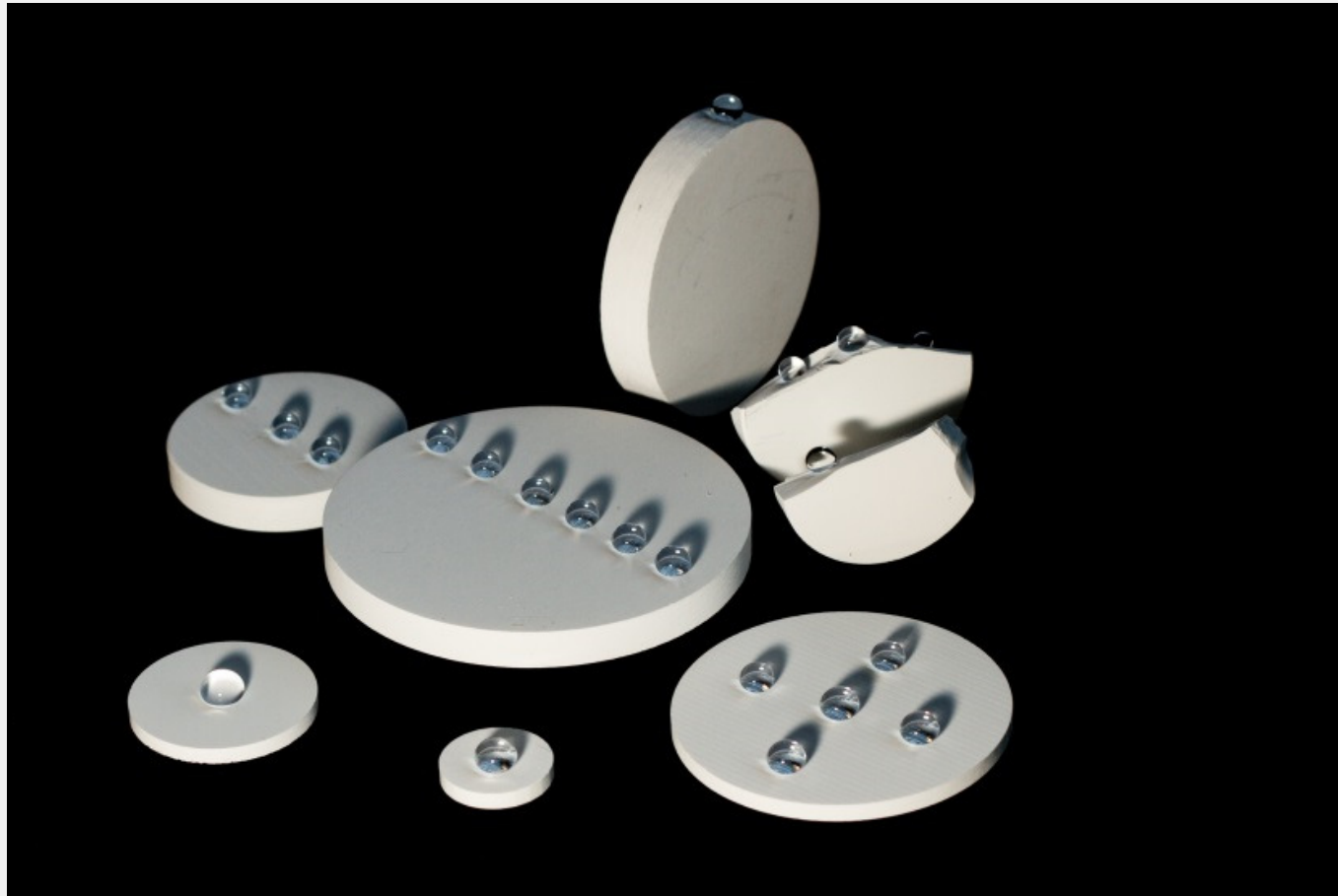
PORE SIZE DISTRIBUTION

COBRA



HYDROPHOBICITY ON SURFACE AND INSIDE THE STRUCTURE

COBRA



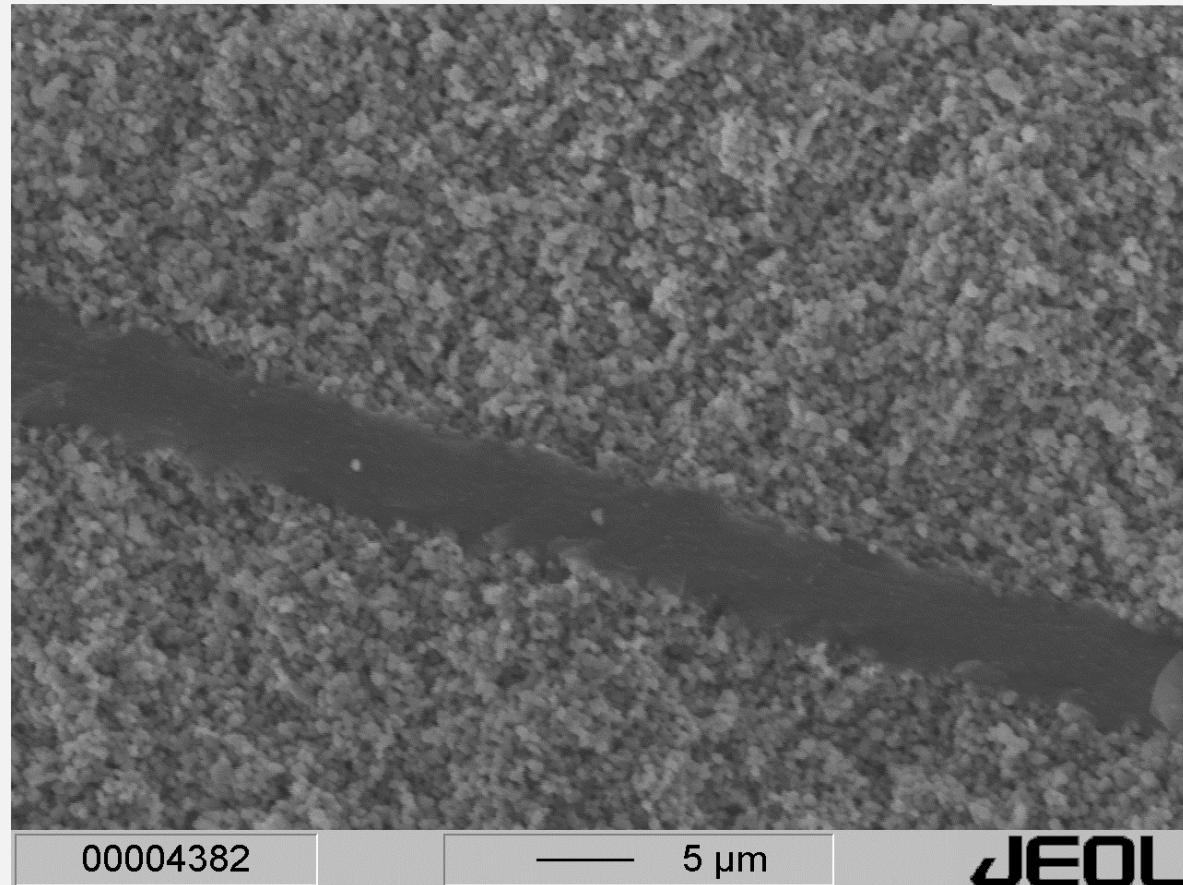
ROCK HYDROPHOBIZATION

COBRA



SANDWICH CONSTRUCTION

COBRA



Possibility to manufacture discs with >1000psi entry pressure

COBRA



**PLEASE CONTACT US FOR YOUR SPECIFIC
REQUIREMENTS / NEEDS**

COBRA TECHNOLOGIES BV

Cobraceramicdiscs.com

info@cobratechnologies.nl