

## Tailor-made services, for each stage of your project

3

### System engineering and membrane development

- Process design and engineering of the system (skid)
- Equipment development (module and seal)
- Development of ceramic and polymeric materials

Send us your project and we will determine together best for you: [orelis@alsys-group.com](mailto:orelis@alsys-group.com)

## Find all Alsys membrane services on the website

[www.alsys.com](http://www.alsys.com)  
HEADING FOR THE FUTURE



#### Contacts ☎:

Europe: +33 (0)4 66 85 95 36  
North America: +1 857 504 2250  
Asia: +86 (0)21 6350 3377



[orelis@alsys-group.com](mailto:orelis@alsys-group.com)  
[www.alsys-group.com](http://www.alsys-group.com)

ALSYS

## Process design and engineering of the system



### Objectives

- ✓ Process engineering: PFD, PID using Draftsight software
- ✓ Equipment and instrument specifications
- ✓ Functional analysis, operating procedure and operating manual
- ✓ CAD drawing (2D, 3D) using SolidWorks
- ✓ Mechanical design
- ✓ Risk analysis (HAZOP)

### Knowledge and experience

- 3 design and project offices in the USA (Boston, MA), France (Salindres) and Canada (Calgary)
- A team of engineers, technicians, designers, and project managers
- Proven quality assurance for O&G, Nuclear, Chemical, Water and Marine industries standards
- Transmittal sheet management with associated Quality documents (Manufacturing and Control Operations, Assembly and Control Operations, Executed Work File, etc.)
- Design and calculation note for ATEX, ESP, 3-A sanitary, and others
- 10 different standard system designs ([see data sheets](#)).

### Recent activities:

- Studies for the nuclear industry
- Design of units with submerged flat sheet ceramic membranes for produced water Oil & Gas)
- Marine scrubber filtration system (for closed loop "Exhaust Gas Cleaning Systems")

## Equipment development (module and seal)

Kleansep™ tubular ceramic range		
Modules type	Membrane area in m <sup>2</sup>	Number of membranes per module
K01	0.16 to 0.5	1
K03	0.48 to 1.5	3
K07	1.12 to 3.5	7
K19	3.04 to 9.5	19
K37	5.92 to 18.5	37
K67	10.72 to 33.5	67
K99	15.84 to 49.5	99
K138	22.08 to 69	138

Material type		
	Kleansep™	CeraMem®
Housings	SS 316L, SS 316Ti, Titanium, Uranus B6 (904L), Hastelloy C22, Hastelloy C276,	CPVC, SS (304, 316L, 2205, 2507, Hastelloy), Fiberglass
Seals	NBR, EPDM, FPM, SILICONE	EPDM, Viton 70 / 90

Pleiade® polymeric flat range		
Modules code	Membrane area in m <sup>2</sup>	Number of plates per module
P10	0.1 to 7	1 to 7
P2030	7 to 27.3	20 to 78
P2060	30.8 to 58.8	88 to 168
P2085	60.9 to 88	174 to 252
P2100	88	250

### Knowledge and experience

- 30 different modules (stainless steel, CPVC, clamp or flange connections) ([see data sheets](#))
- Gasket design to ensure tightness (EPDM...)
- Resistance to high temperatures (100°C), high pressures (60 bar), extreme chemical conditions (pH 0 to 14)



SS Kleansep™ K99 Module



Kleansep™ gasket



Pleiade® module P2100



Kleansep™ CPVC module

### Contacts ☎:

Europe: +33 (0)4 66 85 95 36  
 North America: +1 857 504 2250  
 Asia: +86 (0)21 6350 3377



## Development of ceramic materials



### Objectives

- ✓ Definition of the size and geometry of the supports: external diameter of 25 mm, or 40.5 mm, feed channel diameters from 2 mm to 6 mm
- ✓ Material development based on oxide (zirconia, alumina, silica, titanium) or silicon carbide
- ✓ Ceramics: preparation of powders, formulation of materials, shaping (extrusion) and sintering of supports, deposition and sintering of membranes, sol-gel process, hard-coating, zeolite thin film deposition, organometallic, MOF (Metal Organic Framework)
- ✓ Technical objectives: porosity (porous, semi-dense, dense membrane), mechanical (abrasion) and chemical resistance, surface affinity (hydrophilic, hydrophobic, etc.)

### Knowledge and experience

- 100 different membranes, based on oxide (Kleansep™) or silicon carbide (CeraMem®) ([see data sheet](#))
- 10 tubular and monolith geometries, and 10 cut-off points (MF, UF, NF) ([see data sheet](#))
- A team of engineers and R&D technicians in materials and chemistry. Laboratories, analysis tools (SEM) and testing tools (furnaces)

#### Recent activities:

- New 5 kD and 1 kD nanofiltration membranes
- New 10 kD ultrafiltration membrane
- Continuous improvement of 15 kD ultrafiltration (improved abrasion resistance)
- New 1 µm membrane with mono-dispersed cut-off (to replace DE filters)
- 55 channel membrane
- 40.5 mm diameter
- Universal laser engraving system with QR code

## Development of polymeric materials



### Objectives

- ✓ Polymer development (PAN, PVDF, PES)
- ✓ Polymer: development of a support (woven, non-woven), formulation of materials, deposition of membranes on the support
- ✓ Technical objectives: porosity, mechanical and chemical resistance, surface affinity (hydrophilic, hydrophobic, ...)

### Knowledge and experience

- Polymer membrane range (Pleiade®) ([see data sheet](#))
- Polymer membrane range: 3 materials (PAN, PVDF, PES), 1 geometry: flat ([see data sheet](#))
- A team of engineers and R&D technicians in materials and chemistry. Laboratories, analysis tools (SEM) and tests

#### Latest developments:

- Membrane development: PAN hollow fiber
- Membrane development: PAN for OSN application
- Membrane development: PAN for hybrid membrane (gas separation CO<sub>2</sub> / N<sub>2</sub> / O<sub>2</sub>)

#### Contacts ☎:

Europe: +33 (0)4 66 85 95 36  
North America: +1 857 504 2250  
Asia: +86 (0)21 6350 3377

# Related product data sheets

ALSYS - EN0030 - KLEARSEP OILY WATER SEPARATOR - Data Sheet - V03.21

ALSYS - EN0082 - PERSEP ULTRAFILTRATION SYSTEM - Data Sheet - V02.21

ALSYS - EN0020 - KLEANSEP ULTRAFILTRATION SYSTEM - Case study Degreasing Baths - V05.21

ALSYS - US0601 - PRIMARY METAL INDUSTRY - Case study - V07.19

ALSYS - US0603 - INDUSTRIAL LAUNDRIES - Data Sheet - V03.21

ALSYS - US0602 - CERAMEM CERAMIC MEMBRANES AND MODULES - Data Sheet - V03.21

ALSYS - EN0022 - KLEANSEP CERAMIC MEMBRANES and MODULES - Data Sheet - V03.21

ALSYS - EN0071 - PLEIADE POLYMERIC MEMBRANES - Data Sheet - V07.19

## Contacts

Europe: +33 (0)4 66 85 95 36  
North America: +1 857 504 2250  
Asia: +86 (0)21 6350 3377

