

AET Group has been involved for 20 years in Fine Chemical business combining production activity with its 2 chemical sites, La Mesta Chimie Fine located in Nice (South of France) and La Mesta Bourgogne located in Chalon Sur Saône (Burgundy), as well as engineering activity with Chemsis located in France (near Lyon) and in Switzerland.

**AETGROUP**  
fine chemicals  
We design your future

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**AET GROUP INNOVATIONS**  
One partner synergizing two fields of expertise  
for the best in process industrialization

## RAPTOR® technology: mini continuous flow reactor

RAPTOR®, developed by AET Group, is an **industrial scale oriented continuous reactor** for intensified chemical processes. RAPTOR® is equipped with a high speed stirring system combined with efficient thermal transfer. This technology allows to handle very hazardous or highly exothermic reactions in safe conditions. By increasing synthesis productivity, lowering waste generation and energy consumption, Raptor® technology allows to improve the production costs.



Pilot scale



Industrial scale

### TECHNICAL FEATURES

Pressure:	300 bar (4,350 psi)
Temperature:	-100°C (-150°F) to +300°C (570°F)
Heat exchange Area /volume:	150 m <sup>2</sup> /m <sup>3</sup> (3 to 5 m <sup>2</sup> /m <sup>3</sup> for a batch reactor )
Stirring system:	0 to 1,500 rpm
Residence time:	10 seconds to few minutes
Flow rate:	from 5 to 150 litres per hour (1.3 to 40 gallons per hour)

### REACTIONS OPERATED IN CONTINUOUS

- Acetylation
- Ammonolysis
- Carbene chemistry
- Carbonylation
- Hydrogenation : Liquid or solid catalyst
- Hydrolysis
- Isomerization
- Methylation
- Oxidation
- Phosgenation
- Reductive amination
- Sodium amide alkylation

## JOINT-VENTURE IN HAZARDOUS CHEMISTRY

Valmesta is a Joint-Venture company, combining the expertise of hazardous chemistry experts Valsynthese (SSE Group) and the know-how of technology company AET Group.

Located in Switzerland-Valais, this JV is expert in:

- Azide chemistry
- Phosgenation with phosgene continuous generation
- Chlorination
- Bromination

**VALMESTA**  
SSE | AETGROUP

VALMESTA USES AET GROUP TECHNOLOGIES.

## PHOSGENATION: integrated phosgene generation system

AET Group developed an integrated system for in-situ phosgene generation. Once generated, phosgene reacts immediately in continuous inside Raptor®.

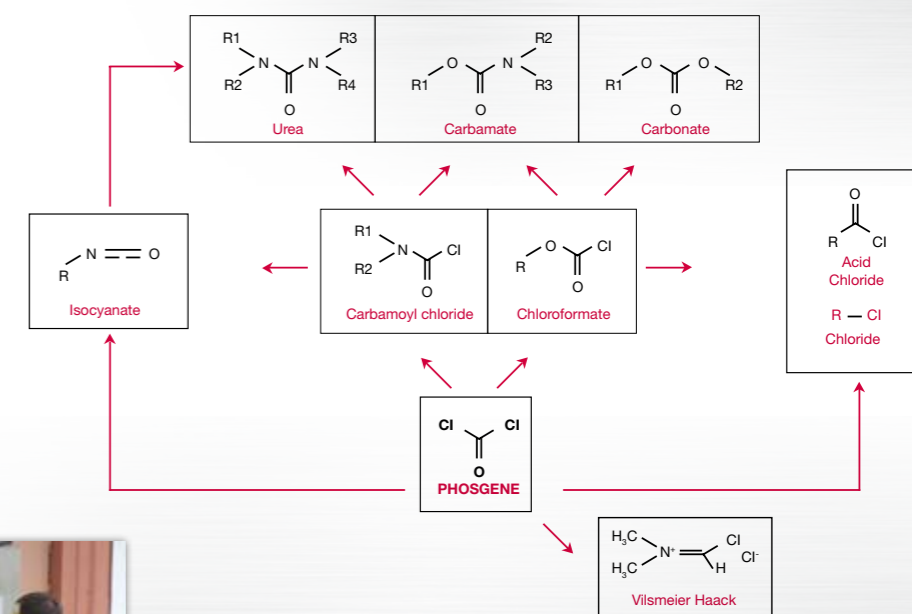
This isolated system allows to perform phosgenations without any phosgene storage or accumulation, and the continuous system allows to improve productivity and selectivity for reduced costs.

The first system is running at La Mesta Chimie Fine with a Phosgene generation capacity of around 4 kg/hour, equivalent to > 20 tons of Phosgene per year. In this equipment, typical phosgenated product campaign size is between few kg to tons.

Another system will be installed in our Joint Venture VALMESTA in Valais – Swizerland with a capacity of 40 kg/hour.



Continuous phosgénation



Integrated system

## PROCESS INTENSIFICATION

Based on synergies between Chemical Development and Chemical Engineering in one single organization, we aim to intensify processes by using AET Group expertise in order to gain productivity and reduce costs:

- ❑ Design of dedicated production systems at very limited cost
- ❑ Adaptation of existing equipments
- ❑ Acceleration of reaction kinetic
- ❑ Use of multipurpose continuous flow reactors



Horizontal 27,000 l reactor