

Brussels - October 2-3, 2019

## Twin Screw Course Europe

Solving industrial issues with the Ludovic® software

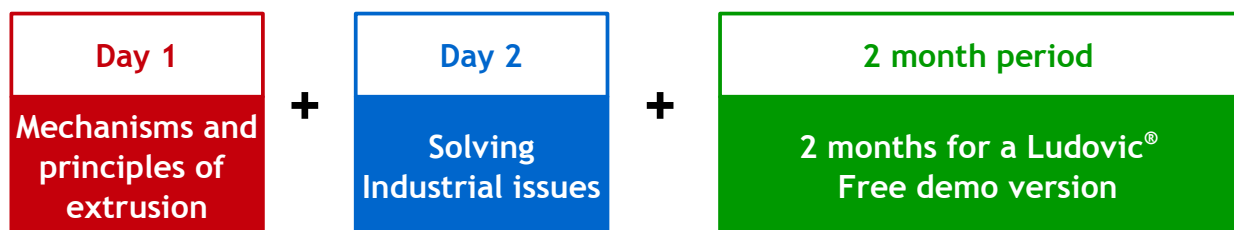
**TWIN SCREW COURSE**  
OCTOBER 2-3, 2019

Extrusion mechanisms and simulation

Process efficiency: 11.6%  
Material flow  
Constanting  
Flow rate height: 41.1  
Rotator Speed Torque: 250

### The Seminar

The twin screw course consists in a 2 days seminar aimed at a first approach of numerical simulation of twin screw extrusion. The real **mechanical principles of extrusion (1)** and their translation in **the numerical simulation model (2)** are explored during two days. As a last step, the **Ludovic® simulation software is provided for a 2 months test period(3)**.



### The audience

The twin screw course is aimed at process engineers, product development technically-oriented engineers working in both research and manufacturing environment.

This extrusion course proposes to establish a concrete link between mechanical principles in extrusion process and their translation into simulations languages. Industrial issues are also tackled.

---

## Day 1 - Mechanics principles of extrusion

---

This first stage of the course is dedicated to the **mechanical process of extrusion**. It is aimed at describing the main mechanical phenomena occurring in the extruder and how to undertake them.

### Program - Day 1

---

09:00 - 10:30	Reminders : about the continuum mechanics, rheology and thermal behaviour	Unit 1
10:30 - 11:00	<i>Break</i>	
11:00 - 12:30	Introduction to the twin screw extrusion process Material flow in the screw elements and the kneading blocks	Unit 2
12:30 - 14:00	<i>Lunch</i>	
14:00 - 15:00	Ludovic® software presentation - global functioning of a twin screw extruder	Unit 3
15:00 - 15:30	<i>Break</i>	
15:30 - 17:00	<b>Applications :</b> <ul style="list-style-type: none"><li>• Distributive mixing</li><li>• Reactive extrusion</li><li>• polymer blends and nano composites</li><li>• Scale up &amp; optimisation</li></ul>	Unit 4

### Operationnal

---

Bruno VERGNES is in charge of this course.

Bruno VERGNES is an engineer, who got a PhD from Ecole des Mines de Paris. He has been working from 1981 in polymer processing at CEMEF. He is currently senior scientist at Ecole des Mines de Paris and general manager of the "Polymer and composites" research unit at CEMEF. His main topics deal with extrusion processes and rheology of complex fluids.

Bruno VERGNES has developed the Ludovic® mathematical model.

---

## Day 2 - Solving industrial issues with Ludovic®

---

This second stage consists in a training based on real industrial issues. The goal of this practical is to solve industrial issues with the support of the Ludovic simulations results.

The proposed industrial issues for the practicals are :

- a **scale up** : how to go from a lab scale (D24mm) to an industrial scale (D56mm)
- a **screw design optimization** : how to increase the mixing efficiency by the screw design

During the training, the attendees will handle the Ludovic® software and will be taught about how to define, compute and interpret a simulation and its results.

### Program - Day 2

---

08:30 - 09:00	<b>Global introduction to the software</b> <ul style="list-style-type: none"><li>• Ludovic® software principles</li><li>• Resolution of Physics equations</li><li>• The computation principles</li></ul>	Reminders of Unit 3
09:00 - 10:30	<b>How to define a complete simulation</b> <ul style="list-style-type: none"><li>• How to design the screw profile in Ludovic®</li><li>• Importing a material</li><li>• Definition the operating conditions</li></ul>	Using the case presented in Unit 4
10:30 - 11:00	<i>Break</i>	
11:00 - 12:30	How to perform a <b>scale up</b> process with the support of the Ludovic® software <ul style="list-style-type: none"><li>• Analyzing the lab scale (24 mm)</li><li>• Performing a Design of Experiments</li></ul>	Using the case presented in Unit 4
12:30 - 14:00	<i>Lunch</i>	
14:00 - 15:30	How to perform a <b>scale up</b> process with the support of the Ludovic® software <ul style="list-style-type: none"><li>• Defining the industrial line design</li><li>• checking the process</li></ul>	Using the case presented in Unit 4
15:00 - 15:30	<i>Break</i>	
15:30 - 17:00	How to optimize the screw design for getting a better mixing efficiency <ul style="list-style-type: none"><li>• Using the simulations comparison</li><li>• Focusing on the mixing markers</li></ul>	
17:00 - 17:30	Conclusion	

### Operationnal

---

Chantal DAVID is in charge of this course. Chantal DAVID is the general manager of the SCConsultants company, in charge of the development and commercialization of the Ludovic® software. Chantal DAVID also manages all the customers applications in the field of twin screw extrusion.

---

## Two months Ludovic® license

---

After this course, the attendee is self reliant in the use of the Ludovic® software for analysing and optimizing his own cases/applications. He is thus provided with a **2 months temporary license of the Ludovic® software**.

During the two months, the attendees benefit from :

- a Ludovic® v5.6 version
- an access to the eSupport site
- an access to the Technical Support (via hot line)



---

### Presentation

---

Ludovic® is a 1D software aimed at analysing the **twin screw extrusion process**. Within a mathematical model, resolving the physics equations (as presented in **Day 1**), Ludovic® performs a thermo mechanical analysis of the process and **predicts the material behaviour**.

Ludovic® is used for product formulation, process set up and scale up issues. Proposing a **fast learning curve**, Ludovic® is easily integrated as complementary tool for saving time to market (**50% of trials saved**).

---

### Pre required equipment

---

In order to attend the **Twin Screw Course**, some pre-required equipments are necessary. Indeed, attendees will be provided with a 2 months license of the Ludovic® software during this training.

---

### Laptop

---



The Ludovic® software will be installed on the attendees laptop for performing the training (Day 2). After the training, the attendee keeps on his own laptop the performed work and the Ludovic® temporary license.

In this way, the attendee will come to the training with :

- a **laptop** (Windows XP, Vista, 7)
- the administrative **rights to install** a new program (Ludovic® v5.6)

---

## Twin screw course : registrations & information

---

### Registrations

The registrations are opened until September 20, 2019

### Fees :

1 900 € per participant (900 € for the second participant of the same company)

The registration fees include :	<i>* 1000€ will deduced on the Ludovic® permanent license price in case of purchase within the next 6 months (after the end of the temporary license).</i>
<ul style="list-style-type: none"><li>• The two days seminar</li><li>• the lunches</li><li>• the dinner</li><li>• the Ludovic® temporary license</li><li>• Guarantee of the license key : 50€</li></ul>	<i>N.B. : French attendees can benefit from a « Convention de formation professionnelle »</i>

SCC keeps the right to cancel this course if a minimum registrations has not been reached.

### Registration form ::

Name :	<b>Gold Package</b> (including a temporary software license - 2
e-mail :	months) <input type="checkbox"/> 1 x 1 900,00 €
	<b>Silver Package</b> (without temporary software license, or
	from second attendee) <input type="checkbox"/> 1 x 900,00 €
Invoice Address .	
Company :	
Function :	
Tel :	
Complementary Information :	

### Place :

**Hotel NH Brussels Airport**  
De Kleetlaan 14B  
B-1831 Machelen (Belgium)  
Tel : +32 2 203 92 52

### Contact

---

For any information, do not hesitate to contact SCC :



**SCIENCES COMPUTERS CONSULTANTS**  
10 rue du plateau des glières  
F-42000 Saint Etienne  
Tel +33(0)4 77 49 75 80  
<http://www.sccconsultants.com>  
scc@sccconsultants.com