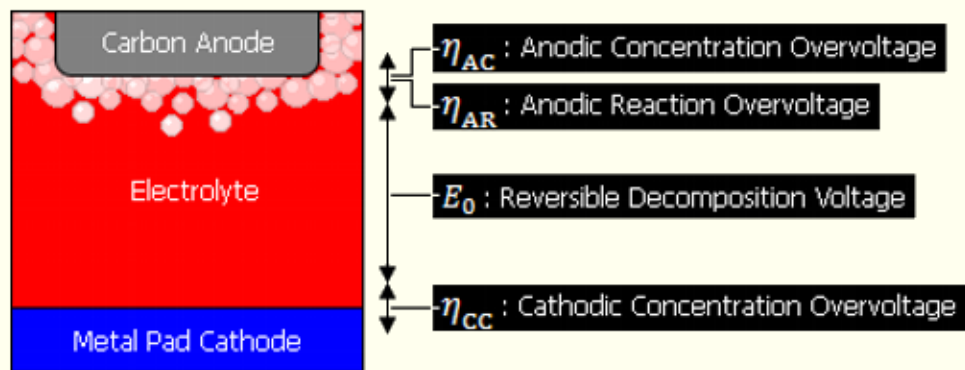
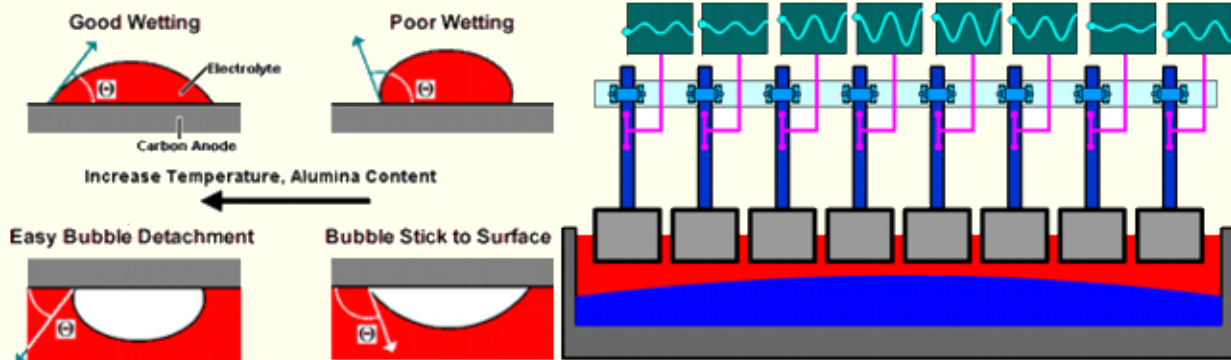


AISem

Seminar and Workshop for Aluminum Smelting

		System $\text{Na}_3\text{AlF}_6 - \text{AlF}_3 - \text{A}$		System $\text{NaF} - \text{AlF}_3 - \text{A}$	
		c_{AlF_3}	c_{NaF}	\bar{c}_{AlF_3}	\bar{c}_{NaF}
$R =$	1	$\frac{1 - c_{\text{AlF}_3} - A}{c_{\text{AlF}_3} + \frac{2}{3}(1 - A)}$	$\frac{c_{\text{NaF}} + \frac{3}{2}(1 - A)}{1 - c_{\text{NaF}} - A}$	$\frac{1 - \bar{c}_{\text{AlF}_3} - A}{\bar{c}_{\text{AlF}_3}}$	$\frac{\bar{c}_{\text{NaF}}}{1 - \bar{c}_{\text{NaF}} - A}$
System $\text{Na}_3\text{AlF}_6 - \text{AlF}_3 - \text{A}$	$c_{\text{AlF}_3} =$	$(1 - A) \cdot \frac{1 - \frac{2}{3}R}{1 + R}$	1	$\frac{5}{3} \cdot \bar{c}_{\text{AlF}_3} - \frac{2}{3}(1 - A)$	$1 - \frac{5}{3} \cdot \bar{c}_{\text{NaF}} - A$
	$c_{\text{NaF}} =$	$(1 - A) \cdot \frac{R - \frac{3}{2}}{1 + R}$	$-\frac{3}{2} \cdot c_{\text{AlF}_3}$	$1 - \frac{5}{2} \cdot \bar{c}_{\text{AlF}_3} - A$	$\frac{5}{2} \cdot \bar{c}_{\text{NaF}} - \frac{3}{2}(1 - A)$
System $\text{NaF} - \text{AlF}_3 - \text{A}$	$\bar{c}_{\text{AlF}_3} =$	$(1 - A) \cdot \frac{1}{1 + R}$	$\frac{3}{5} \cdot c_{\text{AlF}_3} + \frac{2}{5}(1 - A)$	1	$1 - \bar{c}_{\text{NaF}} - A$
	$\bar{c}_{\text{NaF}} =$	$(1 - A) \cdot \frac{R}{1 + R}$	$\frac{3}{5} \cdot (1 - c_{\text{AlF}_3} - A)$	$\frac{2}{5} \cdot c_{\text{NaF}} + \frac{3}{5}(1 - A)$	1



About AlSem

AlSem is a seminar that teaches the theoretical and practical aspects to produce aluminum with the Hall-Héroult electrolysis process. The workshop provides a better and deeper understanding of primary aluminum production because the participants study and solve with AlPrg the examples and exercises discussed during the seminar. AlPrg is a PC computer program for aluminum smelting that helps to execute every days tasks of cell operation and to answer theoretical question of aluminum production.

Contents of AlSem

AlSem contains lectures of basic and advanced content. These lectures may be selected with or without workshop i.e. exercises according to the requirement and the available time. The course material consists of a CD that contains the seminar text and the AlPrg software according to selection and if wanted a printed seminar textbook.

Basic Topics

Principles of the Hall-Héroult-Process

Hall-Héroult and alternative processes, history

Industrial Aluminum Production

cell design, cell operation (computer control)

Mass Balance

aluminium and gas production, alumina and carbon consumption

Properties of the Electrolyte

bath chemistry (liquidus enigma) and analysis

Cell Voltage

components of cell voltage

Energy Balance

heat balance, heat loss

Current Efficiency

cell productivity

Advanced Topics

Raw Materials

alumina, carbon anodes, aluminum fluoride

Cell Operation

optimum cell voltage, profitability analysis, alumina concentration, aluminum fluoride content

Measurements

current efficiency, metal pad motion, side ledge, etc.

Environment, Emissions

cell gases, carbon footprint, spent pot lining

Users Guide of AlPrg

Basic and Advanced Modules

Timetable

The following timetable was created with the assumption that the whole seminar content (basic and advanced topics) is delivered and the workshop is executed with the full version of AlPrg (basic and advanced modules).

Certainly a reduced version may be organized corresponding to the requirements and available time. Please ask for a proposal.

	Monday	Tuesday	Wednesday	Thursday	Friday
8:00- 9.00	Introduction, Principles of Hall- Héroult Production	Mass Balance II	Cell Voltages II	Cell Operation	Environment, Emissions
9:00-10.00	Principles of Hall- Héroult Production	Properties of the Electrolyte I	Energy Balance	Cell Operation	Environment, Emissions
10:00-11.00	Industrial Aluminum Production	Properties of the Electrolyte II	Current Efficiency	Cell Operation	Environment, Emissions
11:00-12.00	Industrial Aluminum Production	Cell Voltages I	Raw Materials	Measurements	Discussion
12:00-14.00	Lunch	Lunch	Lunch	Lunch	(Lunch)
14:00-15.00	Mass Balance I	Workshop Mass Balance	Workshop Cell Voltages	Workshop Raw Materials, Cell Operation	
15:00-16.00	Introduction AlPrg	Workshop Properties of the Electrolyte	Workshop Cell Voltages	Workshop Cell Operation	
16:00-17.00	Workshop Mass Balance	Workshop Properties of the Electrolyte	Workshop Energy Balance	Workshop Measurements	

Prices

The basic prices of the offered services are:

Lectures: 1000 US\$ per day,

CD for every participant containing seminar text and AI Prg-Demo version: 2500 US\$,

one CD and license per plant containing AI Prg modules: see AI Prg pamphlet,

Textbook: 200 US\$ per copy i.e. per participant.

The number of participants for the lectures is not limited. The number of participants for the workshop should not exceed 15 persons i.e. then workshop groups should be formed.

The price of the entire seminar depends on the number of participants, seminar type and AI Prg version:

Basic Seminar (3days, 5 participants, AI Prg Demo)	6500 US\$	= 2500 + 3·1000 + 5·200
Advanced Seminar (4.5days, 5 participants, AI Prg Demo)	8000 US\$	= 2500 + 4.5·1000 + 5·200
Advanced Seminar (4.5days, 15 participants, all AI Prg Modules)	19100 US\$	= 2500 + 4.5·1000 + 15·200 + 9100

Contacts

For more information, please contact:

Dr. Marc Dupuis, P. Eng., GéniSim Inc.

Tel. : +01 418 548 1541

Fax : +01 418 548 4215

E-mail : marc.dupuis@genisim.com,

Internet: <http://www.genisim.com>

Or

E-mail : pme@peter-entner.com,

Internet: <http://www.peter-entner.com>