



How to anticipate the behavior of food and dairy products to spray drying and how to optimize the energy cost ?

Pierre Schuck, Anne Dolivet, Serge Mejean, E. Blanchard, Romain Jeantet

► To cite this version:

Pierre Schuck, Anne Dolivet, Serge Mejean, E. Blanchard, Romain Jeantet. How to anticipate the behavior of food and dairy products to spray drying and how to optimize the energy cost ?. 19. International Drying Symposium (IDS), Aug 2014, Lyon, France. , 2014. hal-01209702

HAL Id: hal-01209702

<https://hal.science/hal-01209702>

Submitted on 3 Jun 2020

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19th International Drying Symposium

August 24-27, 2014
Lyon, France

PROGRAM AND GENERAL INFORMATION



<http://www.ids2014.fr>
ids2014@univ-lyon1.fr

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CHAIRMAN'S ADDRESS

It is my pleasure to welcome you to the 19th IDS held in Lyon. This is the second time this event has been held in France, 26 years later after the successful 6th IDS held in Versailles in 1988. As with all of the previous IDS since the first one in 1978, the ambition of IDS 2014 is to attract researchers and engineers of various sectors to provide a global forum for disseminating new results and data in research development and applications in the field of drying/dewatering sciences and technologies.

All the selected and reviewed full papers have been classified in the classical themes as follows: Modelling and simulation of transport phenomena; Thermodynamic and transport properties of materials; Industrial processes: equipment; optimization; control, scale-up; Energy efficiency and environmental issues; Freeze-drying of pharmaceuticals and biologicals; Drying of foods and biologicals: product quality and process kinetics; Spray-drying and fluidized bed drying.

In response to real societal and economic demands, this 19th IDS aims to have a focus on industrial dryer design and optimization, and on energy savings and environmental issues with increased significant participation coming from industry and R&D Centers. With the efficient help of our international scientific committee, around 340 full manuscripts have been selected, reviewed (two reviewers per paper) and corrected prior to publication on this IDS 2014 CD-ROM. These papers will be presented by Oral (150 communications) or as Posters during the conference itself. About 350 delegates from more than 30 countries representing the 5 continents will participate to the different presentations, discussions and forums. All the discussions will be enhanced and stimulated by eight invited largely well-known specialists coming from all over the world.

The organization of our Symposium would not have been possible without the help and the assistance of many people, institutions or companies through a cooperative effort. Thus, I would like to express my gratitude to Prof. Arun MUJUMDAR for his advice and suggestions, and also to the two previous IDS Chairmen, Prof. Evangelos TSOTSAS and Prof. Xiao Dong CHEN who accepted to share their experience and some data on their previous and perfect IDS management.

I would like to thank deeply all 45 members of the IDS 2014 International Scientific Committee who each took on the really challenging task of reviewing about 20 full paper reviews in a quite short time, and for advertising the event in their laboratories, institutions and countries.

I would like also to express my gratitude to institutions or companies who accepted to support the Award program of IDS 2014, namely the public French Agency for Energy and Environment (ADEME), the French Association for Drying in Industry and Agriculture (AFSIA), largely known by our drying community as the previous organizer of European Drying Conferences, and three private companies (NESTLE, SANOFI, TAYLOR & FRANCIS). Their financial contribution is hereby gratefully recognized in these times of economic hardship that we have still in Europe.

This event was also supported by the Process Control and Chemical Engineering Laboratory of the University of Lyon 1 (LAGEP-UMR CNRS 5007). The administrative part of IDS 2014 management was operated by the Congress Office (Cellule Congrès) of the University Lyon 1.

I am also grateful to all my colleagues of our local organizing committee, especially to my devoted colleagues of LAGEP laboratory, Prof. Roman PECZALSKI who accepted the heavy task of managing our web submission site, SAGA, and who was a major contributor in the edition of this IDS 2014 CD-ROM, as well as to Prof. Séverine VESSOT who assumed efficiently many scientific, logistical, and organizational tasks.

Prof. Julien ANDRIEU
Chairman IDS 2014

CONFERENCE VENUE

The 19th International Drying Symposium will take place at the Lyon Convention Center :

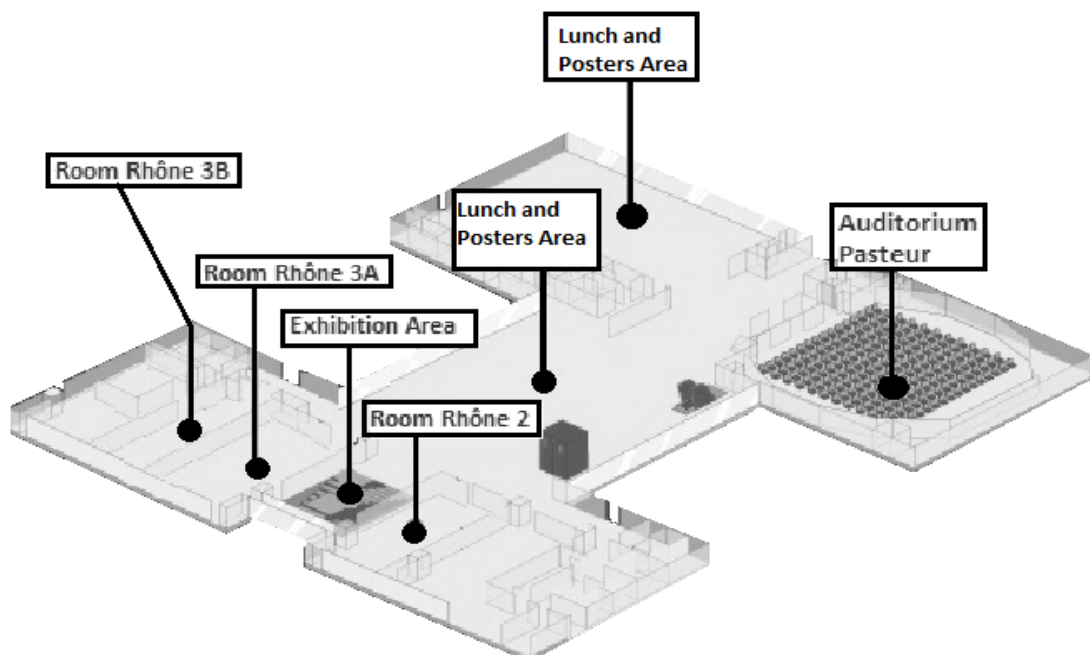
Centre de Congrès - Cité Internationale 50 quai Charles de Gaulle, Lyon, France

The Lyon Convention Center has an exceptional location, between the Rhône river bank and the Parc de la Tête d'Or, the largest public garden in Lyon.

CITÉ | CENTRE DE CONGRÈS | LYON



Floor 1 - Rhône Pasteur



Transfer to the Convention Center

- **From Saint-Exupéry Airport to Part-Dieu Station**

The access from Saint Exupéry Airport to Lyon centre is made via Rhônexpress tramway (<http://www.rhoneexpress.fr>).

Tickets can be bought at the RhônExpress station.

Departure every 15 min to 30 min, from 5.00 am to 12.00 am, and runs everyday including bank Holiday.

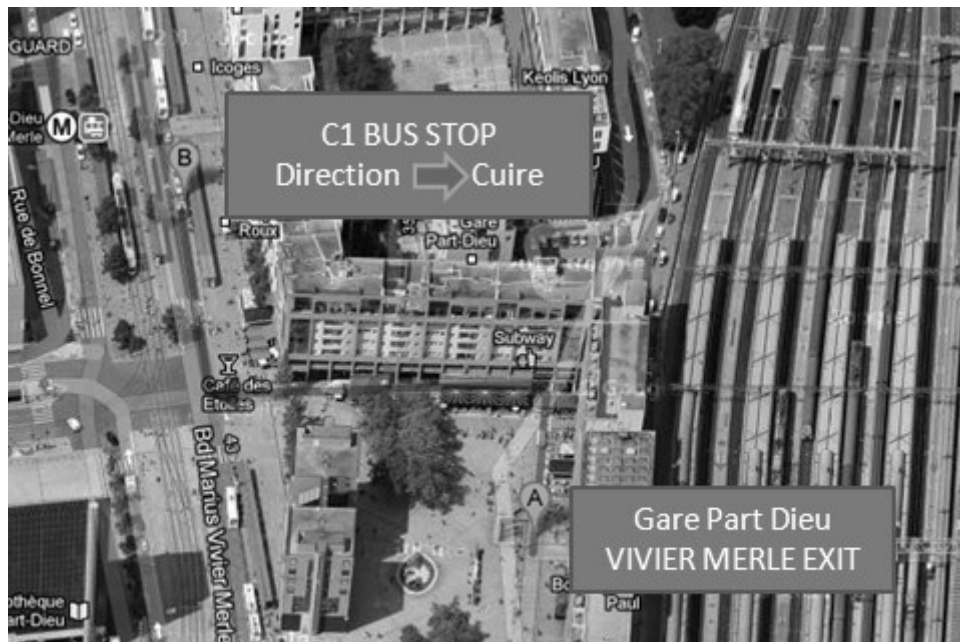
The RhônExpress links the airport to Railway station “La Part-Dieu” in 30 min.

Price: for a one way ticket (at the station), 15,70€ - Round-trip ticket (at the station) 27,20 €

You can also take a taxi : around 50,00 € to the Convention Center

- **From Part-Dieu Station and Rhône Express Tramway (from St-Exupéry AIRPORT)**

Take Bus C1, direction “CUIRE” and get off at “Cité Internationale -Centre des Congrès”



If you arrive at St Exupéry Airport and take the RhônExpress Tramway, you will arrive **at Part-Dieu Station**. Please cross the station and get out at the **Vivier Merle exit** to reach the Bus Stop.

COMMITTEES

Chairmen

Chairman of the Symposium: Julien ANDRIEU, University of Lyon

Honorary Chairman: Arun S. MUJUMDAR, University of Singapore

Local Organization Committee (University Lyon 1)

Julien ANDRIEU

Pierre LAURENT

Claudia COGNÉ

Roman PECZALSKI

Hélène DESMORIEUX

Séverine VESSOT-CRATES

International Scientific Committee

President : Patrick PERRÉ (France)

Members

ALVES-FILHO O. (Norway)

LEONARD A. (Belgium)

AKRITIDIS C. (Greece)

MULET A. (Spain)

ALLAF K. (France)

NAKAGAWA K. (Japan)

ANDRIEU J. (France)

PAKOWSKI Z. (Poland)

ARLABOSSE P. (France)

PANG S. (New Zealand)

BARRESI A. (Italy)

PECZALSKI R. (France)

BONAZZI C. (France)

RAGHAVAN V. (Canada)

BRUTTINI R. (Italy)

RENSTROM R. (Sweden)

CHEN X. D. (China)

ROQUES M. (France)

DAUD W.R. (Malaysia)

ROSELLO C. (Spain)

FARKAS I. (Hungary)

SILVA M. (Brazil)

GIANFRANCESCO A. (Switzerland)

SOPONRONNARIT S. (Thailand)

GLOUANEC P. (France)

TARANTO O. (Brazil)

HEMATI M. (France)

THORAT B. (India)

ITAYA Y. (Japan)

TSOSTSAS E. (Germany)

JINESCU G. (Romania)

TURNER I. (Australia)

JOMAA W. (France)

VAN BOXTEL T. (Netherlands)

KECHAOU N. (Tunisia)

VESSOT S. (France)

KEMP I. (United Kingdom)

ZBICINSKI I. (Poland)

KOWALSKI S. (Poland)

KUDRA T. (Canada)

LANGRISH T. (Australia)

AWARDS

Several awards will be handed out in a ceremony during the conference banquet of IDS2014.

Awards

Sponsored by

Excellence in Drying Research Award

recognizing individual's career achievements and contribution to drying, sponsored by **ADEME(the French Agency for research in Energy and Environment)**



Excellence in Drying Pharmaceuticals and Biologicals

recognizing the excellence in fundamental and applied research in soft drying techniques (vacuum contact drying, freeze-drying; etc.) carried out with pharmaceuticals products like drugs, vaccines, proteins, biologicals, etc. by **SANOFI Pasteur (R.&D. Centre in Lyon)**



Excellence in Drying Award 2014

recognizing the transfer of fundamental results to practice, sponsored by the Association Francaise de Séchage dans l'Industrie et l'Agriculture (**French Working Party on Drying**)



Nestlé Drying Technology Award IDS2014

for the best paper on food drying. Different technologies, such as spray drying, freeze-drying or vacuum drying are largely used in food industry. By sponsoring the **Nestlé Drying Technology Award**, Nestlé would like to encourage scientists to be more active in this field with a focus on industrial sustainable applications to deliver high quality foods with improved Nutrition, Health and Wellness attributes.



IDS Founder's Award 2014 co-sponsored by Taylor & Francis

in recognition of Outstanding Contribution to Drying Research and Excellence in Promotion of Future R&D.



Poster Award

for the 3 best posters presented at IDS2014, rewarding a scientifically valuable content and highly attractive graphical form, granted by the Laboratory of Process Control and Engineering (LAGEP), University Lyon 1.



GENERAL INFORMATION

Reception / Registration

The welcome desk will be located in the main entrance. At your arrival you will be given your badge and your conference bag with documentation related to the conference. Please note that the meeting, breaks, lunches and exhibition area are accessible only with your badge.

Language of the congress

The language of the congress is English.

Insurance

The organizers do not accept responsibility for individual medical, travel or personal insurance, participants are strongly advised to take out their own insurance policies.

Certificate of presence

Each participant will receive a certificate of presence.

Internet

Wireless access will be available for all participants in the entrance hall and exhibition room.

Currency and Bank

The official currency is Euro €. Currencies can be exchanged in banks and exchange currency offices which you can find in the city center and the airport.

Telephone

The international dialing code for France is 33. To give a phone call from France to international, type 00 then the dialing code of the country your trying to reach, then, the phone number of your recipient.

Emergency phone numbers

These numbers are free
Medical care : SAMU : 15.
Police : 17

Touristic Information center

Pavillon du Tourisme - Place Bellecour - B.P. 2254, 69214 Lyon Cedex 2
Tel: +33 (0)4 72 77 69 69
<http://www.lyon-france.com>

Contacts

Université Claude Bernard Lyon 1
43, Boulevard du 11 novembre 1918
69622 Villeurbanne Cedex
Tél : 04 72 43 10 11
Fax : 04 72 43 12 61
Email : solange.perrel@univ-lyon1.fr / aurelie.havyaramana@univ-lyon1.fr
Mobile phone during the conference: 06 89 19 76 60

SOCIAL PROGRAM

WELCOME COCKTAIL on Sunday, August 24th – 7.30 pm to 9.30 pm

A welcome cocktail will be held at Lyon Convention Center. We invite you to come to the “**Salon Pasteur**”, at the end of the registrations.

RECEPTION on Monday, August 25th – 8.00 pm to 10.00 pm

WINE AND CHEESE

Alain, Marc, Guillaume and Frédéric are from the southwest of Lyon, in the heart of the Coteaux du Lyonnais. They have created the Clos St Marc, which produces red wines and white wines AOC Coteaux du Lyonnais since 1983.

Over time the area has continued to grow, and now they cultivate 24 hectares of vines, of which 3 are dedicated to white wine.

The four partners carry out the work of the vine to wine production and sales.

GALA DINNER on Tuesday, August 26th – 8.00 pm to 10.30 pm



The Gala Dinner will take place at the restaurant “**Le Pavillon du Parc**”, located in the Park of the Tête d’Or.

At the heart of the town’s biggest garden, close to the Lyon Convention Center, the Restaurant « Le Pavillon du Parc » offers a wide range of high-quality food. A little extra that makes the difference: its magnificent terrace offering a superb view over the wooded park and the lake. An oxygenating step.

Address:

Le Pavillon du Parc
Parc de la tête d'Or
69006 Lyon

GENERAL TIMETABLE

Day 1 – Sunday, August 24th

Registration	16:00 – 19:00
<i>Welcome cocktail</i>	19:00 – 21:00

Day 2 – Monday, August 25th

Registration	8:00 – 9:00
Opening address	9:00 – 9:30
Plenary lectures 1 and 2	9:30 - 10:40 Auditorium Pasteur
<i>Coffee break</i>	10:40 - 11:00
Oral thematic sessions: A1 : Modeling and simulation of transport phenomena B1 : Industrial processes : equipment, control, scale-up C1 : Drying of food and biologicals. Product quality. D1 : Spray and fluidized bed drying. Particles characteristics.	11:00 – 13:00 Room Rhône 2 Room Rhône 3A Auditorium Pasteur Room Rhône 3B
<i>Lunch break</i>	13:00 – 14:20
Oral thematic sessions: A2 : Modeling and simulation of transport phenomena B2 : Industrial processes : equipment, control, scale-up C2 : Drying of food and biologicals. Product quality. D2 : Spray and fluidized bed drying. Particles characteristics.	14:20 - 16:40 Room Rhône 2 Room Rhône 3A Auditorium Pasteur Room Rhône 3B
<i>Coffee break</i>	16:40 – 17:00
Poster session 1 (odd numbers)	17:00 – 19:00
Meeting of EFCE Working Party on Drying	18:00 – 19:30
<i>Social gathering</i>	20:00 – 21:00

Day 3 – Tuesday, August 26th

Plenary lectures 3, 4 and 5	8:10 - 10:10 Auditorium Pasteur
<i>Coffee break</i>	<i>10:10-10:40</i>
Oral thematic sessions: A3 : Modeling and simulation of transport phenomena B3 : Drying of food and biologicals. Product quality. C3 : Spray and fluidized bed drying. Particles characteristics. D3 : Energy efficiency and environmental issues	10:40 – 12:40 Room Rhône 2 Auditorium Pasteur Room Rhône 3A Room Rhône 3B
<i>Lunch break</i>	<i>12:40 – 14:00</i>
Oral thematic sessions: A4 : Modeling and simulation of transport phenomena B4 : Drying of food and biologicals. Product quality. C4 : Spray and fluidized bed drying. Particles characteristics. D4 : Freeze-drying of pharmaceuticals and biologicals	14:00-16:20 Room Rhône 2 Auditorium Pasteur Room Rhône 3A Room Rhône 3B
Jubilee J. Andrieu	16:20 – 16:40
<i>Coffee break</i>	<i>16:40 – 17:00</i>
Poster session 2 (even numbers)	17:00 – 19:00
Advisory Panel meeting	18:00 – 19:00
<i>Banquet and Awards ceremony</i>	<i>20:00 – 22:30</i>

Day 4 – Wednesday 27 August

Plenary lectures 6, 7 and 8	8:10 - 10:10 Auditorium Pasteur
<i>Coffee break</i>	<i>10:10-10:40</i>
Oral thematic sessions: A5 : Drying of food and biologicals. Product quality. B5 : Freeze-drying of pharmaceuticals and biologicals C5 : Drying of food and biologicals. Process kinetics. D5 : Thermodynamic and transport properties of materials	10:40 – 12:40 Auditorium Pasteur Room Rhône 2 Room Rhône 3A Room Rhône 3B
<i>Lunch break</i>	<i>12:40 – 14:00</i>
Oral thematic sessions: A6 : Drying of food and biologicals. Product quality. B6 : Energy efficiency and environmental issues C6 : Drying of food and biologicals. Process kinetics. D6 : Energy efficiency and industrial equipment	14:00 – 16:20 Auditorium Pasteur Room Rhône 2 Room Rhône 3A Room Rhône 3B
<i>Closing ceremony</i>	<i>16:00 – 16:20</i>

ORAL PRESENTATIONS TIMETABLE

Day 1 – Sunday, August 24th

Registration	16:00 – 19:00
Welcome Cocktail	19:00 – 21:00

Day 2—Monday, August 25th

	Auditorium Pasteur		
08:00	Registration		08:00
09:00	Opening address		09:00
09:30	Keynote Lectures 1 and 2 Chairs : E. Tsotsas ; Z. Pakowski Perspectives on Drying R&D: Past, present and future A. Mujumdar The proper use of mass diffusion equation in drying modelling: from simple configurations to non-Fickian behaviours P. Perré		09:30
10:40	Coffee break		10:40
	Room Rhône 2	Room Rhône 3A	
	Session A1	Session B1	
	Modeling and simulation of transport phenomena	Industrial processes : equipment, optimization, control, scale-up	
	<i>Chairs: P. Perré ; O. Taranto</i>	<i>Chairs: T. Kudra ; T. Ullum</i>	
11:00 a1-1	Drying kinetics of a single droplet containing solids using a Reaction Engineering Approach. S Pawar, J Padding, N Deen, A Jongsma, F Innings, H Kuipers	Modern sustainable drying technologies - pilot case studies O Alves-Filho	11:00 b1-1
11:20 a1-2	Mathematical modeling of the drying of extruded fish feed and its experimental demonstration. A Haubjerg, B Simonsen, S Løvgreen, Bo N. Jørgensen, C T. Veje	Quality drying of medicinal plants A Martynenko, T Kudra	11:20 b1-2
11:40 a1-3	Modeling liquid film rings during convective drying of particle packings Y Wang, H Tariq Mahmood, A Kharaghani, E Tsotsas	Pulse combustion spray-drying: some case studies Z Wu, Haitao Su, W Li, Z Li, J Li, J A. Rehkopf, A Mujumdar	11:40 b1-3
12:00 a1-4	Numerical modeling of mixed flow grain drying with CFD and DEM. H Scaar, F Weigler, M Delele, G Franke, J Mellmann, E Tsotsas	CFD modelling of a co-current pilot spray drying tower M Molaei, T Mahmud, P J Heggs, A Bayly, M Ghadiri, P Bach, H Ahmadian	12:00 b1-4
12:20 a1-5	Effects of different constructions on impact dryer performance - numerical analysis J Bigda, K Ignasiak, K Slowik	Design of solar dryers for small-scale farmers in developing countries P Talbot, C Heilporn, A Schubert, C Delannoy, B Haut	12:20 b1-5
12:40 a1-6	Identification of solvent transport coefficient in silica gel during convective ambient pressure drying R Adamski, Z Pakowski, A Kamińska	Control of freezing as a mean for process intensification in freeze-drying I Oddone, R Pisano, S Grassini, A Barresi	12:40 b1-6
13:00	Lunch		13:00
	Session A2	Session B2	
	Modeling and simulation of transport phenomena	Industrial processes : equipment, optimization, control, scale-up	
	<i>Chairs: S. Kowalski ; P. Glouannec</i>	<i>Chairs: A. Barrési ; F. Courtois</i>	
14:20 a2-1	Air flow simulation in timber (lumber) kilns: shape and geometry effects J Rodríguez-Ramírez, F Ignacio-Caballero, L Leticia Méndez-Lagunas, S Sandoval-Torres	Multi-objective optimization of combined sludge drying "Hot Air - Direct Conduction" A Fuentes, J-P Ploteau, P Glouannec	14:20 b2-1
14:40 a2-2	Modeling of PVC powder drying kinetics in a batch fluidized bed dryer. A Aubin, R Ansart, M Hemati, T Lasuye, M Branly	A first step in drying simulation with a commercial chemical engineering software C Lambert, H Romdhana, P Baudet, F Courtois	14:40 b2-2

15:00 a2-3	Influence of plate size on the evaporation rate of a heated drop-let A-L Ljung, E Lindmark, T. Staffan Lundström	Energy efficiency and product quality aspects of Flame Spray Drying M Taradaichenko, M Piatkowski, I Zbicinski	15:00 b2-3
15:20 a2-4	Convective drying of agitated particle beds - Experiments and DEM-CFD simulations. F Sudbrock, H Kruggel-Emden, S Wirtz, V Scherer	Optimal configuration and operational strategy in super critical CO2 dehydration of foodstuffs C Alemida-Rivera, S Khalloufi, A Mudaliar	15:20 b2-4
15:40 a2-5	Modeling and simulation of self-assembly process of nano-particles in liquid-gas interface A Uzi, Y Ostrovsky, A Levi	Real time monitoring of gas-solid fluidized bed granulation: evolution of particle size, fluidization regime transitions and psychometric parameters O Taranto, C A. M. Silva	15:40 b2-5
16:00 a2-6	Experimental and simulated investigation of particle dynamics in a rotating drum D Araújo dos Santos, R Scatena, F Osmarini Dadalto, C R Duarte, M A de Souza Barrozo	Economic evaluation of solar cabinet dryer system: a case study on onion drying A Gada, Vaibhav Tidke, A Mujumdar, B Thorat	16:00 b2-6
16:20 a2-7	Mathematical description of intermittent convective drying of carrot with osmotic pretreatment assisted with ultrasound. S J Kowalski, A Pawłowski, D Mierzwa, J Szadzińska	Fundamentals and experimental comparison of high pressure air and steam instant controlled pressure drop in the three-stage spray-drying of milk powder S Mounir, T Allaf, I Sulaiman, K Allaf	16:20 b2-7
16:40	Coffee break		16:40
17:00	Poster session 1 : odd numbers (17:00 – 19:00)		17:00
18:00	Business meeting of the EFCE WP Drying (18:00 – 19:30)		18:00
20:00	Social gathering (20:00 – 22:00)		20:00

ORAL SESSIONS

Day 2 – Monday 25 August

	Auditorium Pasteur		
08:00	Registration		08:00
09:00	Opening address		09:00
09:30	Keynote Lectures 1 and 2 Chairs : E. Tsotsas ; Z. Pakowski Perspectives on Drying R&D: Past, present and future A Mujumdar The proper use of mass diffusion equation in drying modeling: from simple configurations to non-Fickian behaviours P. Perré		09:30
10:40	Coffee break		10:40
	Auditorium Pasteur	Room 3B	
	Session C1	Session D1	
	Drying of food and biologicals. Product quality.	Spray and fluidized bed drying. Particles characteristics.	
	<i>Chairs: A. Mulet ; V. Raghavan</i>	<i>Chairs: T. Langrish ; P. Schuck</i>	
11:00 c1-1	Evaluation of some thin-layer models of carrot V Mitrevski	Formulation and processing conditions influencing viability retention of probiotics during spray-drying J Perdana, M B. Fox, R M. Boom, M A.I. Schutyser	11:00 d1-1
11:20 c1-2	Textural properties of apple rings (Var. Golden delicious) subjected to different dehydro-freezing conditions. L Ben Haj Said, S Bellagha, K Allaf	Effect of acidity on crystallization of lactose powders during spray-drying M Saffari, T Langrish	11:20 d1-2
11:40 c1-3	Characterizing processing effects of partially drying/DIC/freezing/thawing apples through a comparative study of two texture assessment methods of compression-relaxation and puncture. L Ben Haj Said, S Bellagha, K Allaf	Monodisperse particles containing docosahexaenoic acid (dha) made with monodisperse droplet generator coupled with an air-drying chamber L Che, X You, Y Wang, B Wang, X Dong Chen	11:40 d1-3
12:00 c1-4	Microwave-assisted hot air drying characteristics of osmotically dehydrated broccoli stalk slices N Salina Md Salim, Y Gariepy, V Raghavan	Particle morphology as a means for investigating single-droplet drying of dairy products T Thu Hang Tran, K Terrazas-Velarde, J Avila-Acevedo, E Tsotsas	12:00 d1-4

12:20 c1-5	Recent developments in the high-quality drying with energy saving characteristics for fresh foods M Zhang	Formation of microspherical particles from carbohydrate polymers via anti-solvent vapour precipitation J Yuan Tan, V Menh Tang, J Nguyen, S Mansouri, M Wai Woo, K Hapgood, X Dong Chen	12:20 d1-5
12:40 c1-6	Microwave-assisted pulse-spouted bed freeze drying of stem lettuce slices -effect on product quality Y Wang	Absorption-dehydration strategy in sub-micron particle production from atomised droplets via anti-solvent vapour precipitation S Chew, D Wardhana, Mukhyiddin, S Mansouri, K Hapgood, M Wai Woo, D Chen Xiao	12:40 d1-6
13:00	Lunch		13:00
	Session C2	Session D2	
	Drying of food and biologicals. Product quality.	Spray and fluidized bed drying. Particles characteristics.	
	<i>Chairs: M. Silva ; B. Thorat</i>	<i>Chairs: A. Gianfrancesco ; I. Zbicinski</i>	
14:20 c2-1	Optimization of combined drying technology for lettuce based on response surface methodology Y Yuan, Z Zhao	Experimental investigation of continuous fluidized bed spray granulation with internal classification M Schmidt, A Bück, E Tsotsas	14:20 d2-1
14:40 c2-2	Selection of operational strategies in a microwave drying process of cellulose-alginate capsules J Mardaras, J Ignacio Lombraña, I González, L Bergara	Influence of drying conditions to the product quality during continuous fluidized bed spray granulation T Hoffmann, C Rieck, M Schmidt, A Bück, E Tsotsas, M Peglow	14:40 d2-2
15:00 c2-3	Application of ultrasonic treatment to improvement of the functionality of dried cashew apples S Rodrigues, T Fonteles, K Leite, F Fernandes	Analysis influence of drying rate on spatial morphology of agglomerates M Dadkhah, M Peglow, E Tsotsas	15:00 d2-3
15:20 c2-4	Protein-based microencapsulation with freeze pretreatment K Nakagawa, T Jarunglumlert, S Adachi	Multi-zone model for dynamic behavior in horizontal fluidized bed granulator K Meyer, A Bück, E Tsotsas	15:20 d2-4
15:40 c2-5	Ultrasound assisted osmotic dehydration: Effect on drying kinetics and quality of carrot J Szadzińska, S J Kowalski	Study of different excipients on the obtainment of copaifera langsdorffii spray-dried extracts. A Costa-Machado, L Freitas	15:40 d2-5
16:00 c2-6	Effect of dextrose equivalent of maltodextrin on the stability of emulsified coconut-oil in spray-dried powder T Matsuura, R Matsushita, A Ogawa, M Tomabechei, T Loon Neoh, S Gohtani, H Yoshii	Effect of fluidized bed drying temperature on kinetic and quality of partially parboiled white waxy rice P Jaiboon, S Prachayawarakorn, S Devahastin, S Soponronnarit	16:00 d2-6
16:20 c2-7	Mechanisms of drying acceleration by ultrasounds G Musielak, D Mierzwa, J Kroehnke	Spray-drying of sodium caseinate aggregates loaded with β -carotene: an influence of aggregate structure on encapsulation efficiencies K Nakagawa, T Jarunglumlert, S Adachi	16:20 d2-7
16:40	Coffee break		16:40
17:00	Poster session 1 : odd numbers – (17:00 – 19:00)		17:00
18:00	Business meeting of the EFCE WP Drying (18:00 – 19:30)		18:00
20:00	Social gathering (20:00 – 22:00)		20:00

ORAL SESSIONS

Day 3 – Tuesday 26 August

	Auditorium Pasteur		
08:10	Keynote Lectures 3, 4 and 5 Chairs : P. Perré ; S Kowalski Multi-scale approaches to processes that combine drying with particle formation E. Tsotsas Reaction Engineering Approach (REA) to modeling drying problems : ideology versus reality X.D. Chen, A. Putranto Achieving food products performance by mastering the drying process A. Gianfrancesco		08:10
10:10	Coffee break		10:10
	Room Rhône 2	Auditorium Pasteur	
	Session A3	Session B3	
	Modeling and simulation of transport phenomena	Drying of food and biologicals. Product quality.	
	<i>Chairs: A. Mujumdar</i>	<i>Chairs: N. Kechaou ; T. Van Boxtel</i>	
10:40 a3-1	Two phase CFD model of counter current spray-drying process P Wawrzyniak, M Jaskulski, I Zbicinski, M Podyma	Impact of spray-drying process parameters on dairy powders surface composition and properties Y Nikolova, J Petit, A Gianfrancesco, C Sanders, C Gaiani, J Scher	10:40 b3-1
11:00 a3-2	CFD model of spray-drying with particle agglomeration M Jaskulski, P Wawrzyniak, I Zbicinski	Investigations on the microwave induced drying and expansion of extruded starch-based pellets S Kraus, H P. Schuchmann, V Gaukel	11:00 b3-2
11:20 a3-3	Effect of water vapour on lower limit temperature during drying of polymer films cast from a polymer-organic solvent solution M Yoshida, T Yamane, T Shibayanagi	Ethanol as drying accelerator of guaco leaves (mikania laevigata schultz bip. ex baker) M G. Silva, R M. S. Celeghini, M Aparecida Silva	11:20 b3-3
11:40 a3-4	The effects of internal and external forces on the particle dynamics and internal flow in suspension droplets Y Ostrovski, A Uzi, A Levy	Drying characteristics and product quality of cowpea dried in a convective tunnel dryer Z Wu, J Shi, Qing Liu, A Mujumdar	11:40 b3-4
12:00 a3-5	Moving away from macroscopic modelling of transport processes in porous media: two-scale approaches and their applications. E Carr, P Perré, I Turner	Drying of vegetable products in closed systems J Stawczyk, M Krempski-Smejda, K Śmigielski, R Prusinowska	12:00 b3-5
12:20 a3-6	Enhancement of drying of paper with phase change material Y Khakpour, J Seyed-Yagoobi	Drying of hydrolyzed collagen with grape pulp in spouted bed: influence of process variables on the powder production efficiency J Junior Butzge, F Condi De Godoi, S Cristina Dos Santos Rocha	12:20 b3-6
12:40	Lunch		12:40
	Session A4	Session B4	
	Modeling and simulation of transport phenomena	Drying of food and biologicals. Product quality.	
	<i>Chairs: Z. Pakowski ; R. Renstrom</i>	<i>Chairs: R. Jeantet ; K. Allaf</i>	
14:00 a4-1	2-D Hydro-viscoelastic model for highly deformable product convective drying simulation L Hassini, R Peczalski, S Azzouz	Near infrared spectroscopy as a technique to monitor water and polyphenol contents of rose leaves during their drying P Talbot, O Abbas, V Baeten, B Haut	14:00 b4-1
14:20 a4-2	Drying of multilayer porous media by combined radiative-convective heating: application to gypsum plasterboard P Le Bideau	Production of natural color powder from <i>Centella Asiatica l.</i> leaves: effects of pretreatment and drying methods. L Ngamwonglumlert, S Devahastin, N Chiewchan	14:20 b4-2
14:40 a4-3	Experimental investigation of hydro-mechanical coupling during clay drying N Prime, L Fraikin, A Léonard, R Charlier, S Levasseur	Effects of air drying treatments on the retention of 6-gingerol in ginger G Szrednicki, H Gan	14:40 b4-4

15:00 a4-4	Pore network simulations to determine influence of pore structure on wetting-drying kinetics of porous particles A Rahimi, A Kharaghani	Lysine loss during spray-drying of dairy products: combined effect of reaction kinetics, drying kinetics and spray-drying conditions. An experimental-numerical study. I Schmitz-Schug, U Kulozik, P Foerst	15:00 b4-5
15:20 a4-5	Effect of wheat kernel shape on the evaluation of drying-related phenomenological properties: an irreversible thermodynamics approach G T. Santos, M Fortes, J Helvécio Martins, R P. Amantéa	Effect of air-drying temperature on technological properties, color, total phenols and flavonoids kinetics' of lemon (Citrus limon. v. lunari) peels N Ghanem, C Bonazzi, D Mihoubi, N Kechaou, N Boudhrioua Mihoubi	15:20 b4-6
15:40 a4-6	Isothermal drying of pore networks in the presence of capillary liquid films – Comparison of experiments with simulation results N Vorhauer, E Tsotsas, M Prat	Microbial analysis of dried fish and comparative study using different drying methods N Nagwekar, V Tidke, B Thorat	15:40 b4-7
16:00 a4-7	Study of model application for drying of pulp fruit in spouted bed with intermittent feeding and accumulation T Naianne Pires Dantas, F Canindé Moraes Filho, J Silva Souza, J Araújo Oliveira, S C dos Santos Rocha, M de Fátima Dantas Medeiros	The influence of ultrasounds on retention of bioactive compounds in osmo-convectively dried sour cherries K Siucińska, M Mieszczakowska-Frąc, A Połubok, D Konopacka	16:00 b4-8
16:20	Jubilee ceremony J. Andrieu Auditorium Pasteur		16:20
16:40	Coffee break		16:40
17:00	Poster session 2 : even numbers – (17:00 – 19:00)		17:00
18:00	Advisory Panel Meeting (18:00 – 19:00)		18:00
20:00	Banquet and Awards (20:00 – 22:30)		20:00

ORAL SESSIONS

Day 3 – Tuesday 26 August

	Auditorium Pasteur		
08:10	Keynote Lectures 3, 4 and 5 Chairs : P. Perré ; S Kowalski Multi-scale approaches to processes that combine drying with particle formation E. Tsotsas Reaction Engineering Approach (REA) to modeling drying problems: ideology versus reality X.D. Chen, A. Putranto Achieving food products performance by mastering the drying process A. Gianfrancesco		08:10
10:10	Coffee break		10:10
	Room Rhône 3A	Room Rhône 3B	
	Session C3	Session D3	
	Spray and fluidized bed drying. Particles characteristics. <i>Chairs: I. Kemp ; X.D. Chen</i>	Energy efficiency and environmental issues. <i>Chairs: O. Alves-Filho ; A. Leonard</i>	
10:40 c3-1	Spherical crystalline amino-acid particles from spray-drying R Lin, M Wai Woo, W Liu, C Selomulya, X Dong Chen	Convective drying of sawdust/sludge mixtures in a fixed bed: The effect of sludge origin J Li, L Fraikin, T Salmon, D Toye, A Léonard	10:40 d3-1
11:00 c3-2	Monte Carlo modelling of particle coating in fluidized beds C Rieck	Comparison of moisture and temperature distribution in a single rice kernel subjected superheated steam drying and hot air drying H Xiaoli, W Zhenhua, X Bo, W Zhonghua, L Xiangdong	11:00 d3-2
11:20 c3-3	Fluidized Bed Technology: Microencapsulation of lactic acid bacteria and their protection after a coating process V Oehl	Drying characteristics and quality evaluation of mixed culture mesophilic sludge under hot air and heat pump drying method. W Chern Kau, S Kian Chin, P Eong Poh	11:20 d3-3
11:40 c3-4	Model based prevention of powder build-up in spray driers, including visualization M Fox, H Straatsma, M Verschueren, C Akkerman	High efficiency rotary steam drying of moist minerals and fuels C-G Berg, H Mansikkaviita	11:40 d3-4
12:00 c3-5	Experimental analysis of the microstructure of single particles and micro droplets F Sondej, A Bück, E Tsotsas	Energetic and exergetic analysis of two-dimensional grain dryers R P. Amantéa, M Fortes, J Helvécio Martins, G T. Santos	12:00 d3-5

12:20 c3-6	Modelling of the impact of the initial droplet properties and the drying process parameters on surface composition of a multi-component particle A Porowska, A Gianfrancesco, L Fries, S Palzer, S Heinrich	Energy aspects in electrohydrodynamic drying T Kudra, A Martynenko	12:20 d3-6
12:40	Lunch		12:40
	Session C4	Session D4	
	Spray and fluidized bed drying. Particles characteristics. <i>Chairs: E. Tsotsas ; T. Kudra</i>	Freeze-drying of pharmaceuticals and biologicals <i>Chairs: K. Nakagawa ; S. Vessot</i>	
14:00 c4-1	Replacing the traditional roasting process with fluidized bed drying technique for processing immature green paddy W Phomkong, L Wiset, N Poomsa-ad, A Ekpong	Freeze-drying microscopy as a tool to study sublimation kinetics P Raman, C Rielly, A Stapley	14:00 d4-1
14:20 c4-2	Microwave-assisted fluidized bed drying of yeast immobilized on potato pulp carrier M Paslawska, B Stępień, W Drożdż	A freeze-drying microscopy study of the kinetics of sublimation in a model lactose system P Raman, C Rielly, A Stapley	14:20 d4-2
14:40 c4-3	How to anticipate the behaviour of food and dairy products to spray-drying and how to optimize the energy costs? P Schuck, A Dolivet, S Mejean, E Blanchard, R Jeantet	Drying conditions affect the antioxidant properties of agricultural products: a study on hot-air-dried and freeze-dried spirulina maxima K Nakagawa, W Ritcharoen, P Sri-uam, P Pavasant, S Adachi	14:40 d4-3
15:00 c4-4	Protein kind driven particle morphology and resulting dairy powders properties C Sadek, P Schuck, Y Fallourd, N Pradeau, C Le Floch-Fouéré, R Jeantet	Stratified packed bed structures could increase the drying rates in spray freeze-drying systems R Bruttini, A Liapis	15:00 d4-4
15:20 c4-5	Spray-drying with a two-fluid nozzle to produce fine particles : atomisation, scale-up and modelling I Kemp, T Hartwig, R Herdman, R Wadley, P Hamilton, A Bisten, M Pinto	Chamomilla recutita extract microencapsulation by spray freeze-drying S Pereira, A Lanchote, L Freitas	15:20 d4-5
15:40 c4-6	Comparative study of the efficiency of whey protein isolate in protecting <i>Lactobacillus Plantarum</i> A17 against spray-drying B May, S Khem	A mutual gas diffusion model improves the prediction of mass transfer in freeze-drying I C Trelea, F Fonseca, S Passot, D Flick	15:40 d4-6
16:00 c4-7	Minimization of particle dispersion in a continuous horizontal fluidized bed P Bachmann, E Tsotsas	Freeze-drying of pharmaceuticals with non-aqueous solvent. Influence of freezing protocol and of formulation on drying times and on residual solvents contents R Daoussi, S Vessot, J Andrieu, J Jose, O Monnier	16:00 d4-7
16:20	Jubilee ceremony J. Andrieu		Auditorium Pasteur 16:20
16:40	Coffee break		16:40
17:00	Poster session 2 : even numbers – (17:00 – 19:00)		17:00
18:00	Advisory Panel Meeting (18:00 – 19:00)		18:00
20:00	Banquet and Awards (20:00 – 22:30)		20:00

ORAL SESSIONS

Day 4 – Wednesday 27 August

	Auditorium Pasteur	
08:10	Keynote Lectures 6, 7 and 8 Chairs : X. D. Chen ; I. Zbicinski Ultrasound assisted hybrid drying of biological materials S. Kowalski Vaccines freeze-drying, a century of challenges P. Vacus Recent developments in spray-drying T. Ullum	08:10
10:10	Coffee break	

	Auditorium Pasteur	Room 2	
	Session A5	Session B5	
	Drying of food and biologicals. Product quality	Freeze-drying of pharmaceuticals and biologicals	
	<i>Chairs: F. Courtois ; A. Mulet</i>	<i>Chairs: R. Bruttini ; P. Vacus</i>	
10:40 a5-1	Effect of air drying temperature on individual phenolic compounds and antioxidant activity kinetics of orange peels N M'hiri, I Ioannou, M Ghoul, N Boudhrioua Mihoubi	Synthesis of zeolite fibers by unidirectional freezing and steam-assisted crystallization H Tamon, T Iwaya, H Mori, N Sano	10:40 b5-1
11:00 a5-2	Effect of water activity and storage time on lipid oxidation of babassu coconut milk powder A Santana, L Kurozawa, R Oliveira, K Park	Effect of the drying conditions on the drying curves and the solvent retention capacity of Barely groats Ó Rodríguez, M Krempski, I Zbicinski, S Simal	11:00 b5-2
11:20 a5-3	Effect of impinging stream drying temperature on mechanical property and head rice quality of parboiled rice P Pruengam, S Soponronnarit, S Prachayawarakorn, S Devahastin	Freeze-drying of initially unsaturated porous material frozen from aqueous solution W Wang, D Hu, Y Pan, K Yu, G Chen	11:20 b5-3
11:40 a5-4	Characteristic roasting and coloring curves for coffee beans D Pramudita, T Araki, Y Sagara	Microencapsulation of extra virgin olive oil with spray-drying and freeze-drying methods: effect of wall material type and composition A Zungur, M Koç, F Kaymak-Ertekin	11:40 b5-4
12:00 a5-5	Dehydration and quality characterization of moringa olifera leaves K Prasad, Y Singh	Process monitoring and design when using tert-butanol/water cosolvent systems in pharmaceutical freeze-drying R Pisano, D Fissore, A. Barresi	12:00 b5-5
12:20 a5-6	Energy recovery of olive mill wastewater through pellets production from their blend with lignocellulosic biomass: drying step investigation N Kraiem, M Amine Balti, N Kechaou, M Jeguirim, R Said	Three-dimensional measurement of ice crystals in frozen materials by near-infrared imaging spectroscopy G Do, T Araki, Y Bae, K Ihikura, Y Sagara	12:20 b5-6
12:40	Lunch		12:40
	Session A6	Session B6	
	Drying of food and biologicals. Product quality	Energy efficiency and environmental issues.	
	<i>Chairs: G. Szrednicki ; K. Allaf</i>	<i>Chairs: S. Pang ; Y. Itaya</i>	
14:00 a6-1	Microwave vacuum drying of probiotics embedded in a protective foam matrix S Ambros, U Kulozik	Sewage sludge drying in a continuous pilot-scale paddle dryer: experiments and modeling with a markovian approach M Milhé, M Sauceau, P Arlabosse	14:00 b6-1
14:20 a6-2	Effect of using konjac glucomannan in combination with maltodextrin on antioxidant activity of mulberry leaf extract powder by spray-drying N Surapun, K Duangmal, C Borompichaichartkul	The development of large pressurized fluid bed steam dryers from fundamental research to industrial plants. A Sloth Jensen	14:20 b6-2
14:40 a6-3	Drying kinetics and energy consumption of combined convective- electrohydrodynamic drying of mushroom slices M Havet, S Taghian Dinani	Large scale drying in superheated steam under pressure A Sloth Jensen	14:40 b6-3
15:00 a6-4	Experimental and mathematical studies of sesame by-products' microwave drying Y Khaldi, K Kriaa, B Hadrach, M Amine Balti, N Kechaou	Sludge treatment system combined with bio-drying and carbonization N Kobayashi, H Hamabe, Y Itaya	15:00 b6-4
15:20 a6-5	Extraction of essential oils of citronella: Part2: Effect of the drying on the yield and the quality of essential oil M Amine Balti, K Kriaa, B Hadrach, M Néji Kadri, N Kechaou	CAPE for environmental efficiency: application to industrial process for biomass drying H Romdhana, C Bonazzi, J-P Belaud, C Sablayrolles, M Montrejaud-Vignoles, C Penicaud, M Esteban-Decloux	15:20 b6-5
15:40 a6-6	Influence of cooking as a pre-treatment to microwave drying of manioc roots N Rosa Pereira, L Tinoco Gonçalves, T Silva Soares, L Poses Mussi, K Silva Ferreira	Using of an experimental design to characterize the convective drying behavior of different sludges L Fraikin, B Herbreteau, T Salmon, F Nicol, M Crine, A Léonard	15:40 b6-6
16:00	Closing ceremony		16:00
16:20	End		16:20

ORAL SESSIONS

Day 4 – Wednesday 27 August

	Auditorium Pasteur		
08:10	Keynote Lectures 6, 7 and 8 Chairs : X. D. Chen ; I. Zbicinski Ultrasound assisted hybrid drying of biological materials S. Kowalski Vaccines freeze-drying, a century of challenges P. Vacus Recent developments in spray-drying T. Ullum		08:10
10:10	Coffee break		10:10
	Room 3A	Room 3B	
	Session C5	Session D5	
	Drying of food and biologicals. Process kinetics.	Thermodynamic and transport properties of materials	
	<i>Chairs: G. Chen ; M. Fortes</i>	<i>Chairs: O. Taranto ; M. Roques</i>	
10:40 c5-1	Intensification of convective drying process by ultrasonic assisted pre-treatments: effects on tissue water status and drying kinetics of apples Ó Rodríguez, P J. Liábres, J Cárcel, R González, S Simal	Dualism of the hydration water visualized in drying processes of foods Y konishi, M Kobayashi	10:40 d5-1
11:00 c5-2	Influence of air routing on the drying behavior of air dried apple – an experimental and simulation approach A-M Nuñez Vega, C Rombach, W Hofacker	Effect of the instant controlled pressure drop treatment on the properties of carrot T Nguyen, J-L Lanoisellé , K Allaf	11:00 d5-2
11:20 c5-3	Direct formulation of <i>Citrus Aurantium</i> peels by osmotic dehydration process: study of the mass transfer kinetics M Ben Zid, C Dhuique Mayer, A Servent, A Collignan, M Dornier, A Sahli, S Bellagha	Study on shrinkage deformation of food in microwave vacuum drying T Tsuruta, H Tanigawa, H Sashi	11:20 d5-3
11:40 c5-4	The effect of selected microwave powers on the drying kinetics of corn husk A Akdoğan, G Çalışkan, S. Nur Dirim	Sorption isotherm and mass diffusivity determined in teak wood used as buiding material C A Houngan, M Anjorin, A Vianou, P Perre	11:40 d5-4
12:00 c5-5	Influence of vegetable structure on ultrasonically assisted convective drying C Ozuna, A Mulet, J Vicente García-Pérez, E Riera, J Andrés Cárcel	Desorption isotherms and drying kinetics of cactus/brewer's grains mixture fermented with lactic bacteria I Chkir, M Amine Balti, L Ayed, S Azzouz, N Kechaou, M Hamdi	12:00 d5-5
12:20 c5-6	A critical analysis about using of a thin layer drying concept to model the drying of leaves R A. B. Lima, K C. Ribeiro, M do Carmo Ferreira, J T. Freire	Method for measuring stickiness in spray drying based on particle impact T Petersen, J Sloth, T Ullum, O Hassager	12:20 d5-6
12:40	Lunch		12:40

	Session C6	Session D6	
	Drying of food and biologicals. Process kinetics.	Energy efficiency and industrial equipment	
	<i>Chairs: A. Mulet ; J. Andrieu</i>	<i>Chairs: R. Peczalski; R. Rémond</i>	
14:00 c6-1	Drying of droplet containing insoluble nanoscale particles: falling rate drying stage U Maurice, M Mezhricher, A Levy, I Borde	Design and optimization of industrial woody biomass pretreatment addressed by a multiscale computational model: particle, bed and dryer levels J Colin, R Rémond, P Perré	14:00 d6-1
14:20 c6-2	Drying kinetics and bioactivity of beetroot slices pre-treated in concentrated chokeberry juice and finish dried with vacuum microwaves A Figiel, K Lech, M Serowik, M Szarycz, A Wojdyło, M Korzeniowska	How to replace primary energy with a superheated steam dryer The BMA fluidized bed steam dryer WVT J Gaßmann, H Fersterra, G Caspers, H Hafemann	14:20 d6-2
14:40 c6-3	Impact of ultrasound pretreatment on the osmo-dehydration kinetics and sensory evaluation of beetroot slices A Ochoa-Martínez, B Esquivel-González, S Marina González-Herrera, J Morales-Castro	From feasibility to commissioning - process development at CLARIANT M Dyballa	14:40 d6-3
15:00 c6-4	Evaluation of degradation kinetics of nutritional components during drying of fresh foods X Jin, A J B van Boxtel, X Dong Chen	Numerical investigation of wood drying with intermittent energy source at low exergy content R Rémond, P Perré	15:00 d6-4
15:20 c6-5	Effect of different infrared drying temperatures on drying kinetics, antioxidant activities, biochemical and functional parameters of fresh and dried green algae "Ulva sp." (Chlorophyta, ulvales). S Trabelsirekik, B Hadrich, K Kriaa, G Bedoux, N Bourgougnon, N Kechaou	The drying of a single whey protein droplet: vacuole and hole formation J Bouman, P Venema, M Schutyser, R de Vries	15:20 d6-5
15 :40 c6-6	Pulsed fluidized bed behaviour with changes in pressure chambers sizes G Rogula, M Rychlik	Increasing the dry matter content of the feed of spray dryers C Akkerman, M Weeks	15 :40 d6-6
16:00	Closing ceremony		16:00
16:20	End		16:20

POSTERS

1 - Modeling and simulation of transport phenomena		
P1	Ali Darvan, Martin Sommerfeld	A new approach to modelling of single droplet drying
P2	Lars Nilsson	Mathematical models for compressible flow in porous media
P3	Fernanda Casciatori, Andreas Bück, Joao Cláudio Thoméo, Evangelos Tsotsas	Two-phase two-dimensional model for heat and moisture transfer for a packed bed solid-state bioreactor
P4	Shima Yousefi, Zahra Emam-Djomeh, M Mousavi, M Shahriari, I Zbicinski	Anthocyanin degradation of spray-dried raspberry juice powder: Explanation of temperature and moisture profiles using computational fluid dynamic simulation technique
P5	Shuxia Qiu, Peng Xu, Arun S. Mujumdar	A numerical study of heat and mass transfer in unsteady impinging jet on the rough surface
P6	Rafael Oliveira Defendi, Rodrigo Orgeda da Silva, Gisleine Elisa Cavalcante da Silva, Paulo Roberto Paraíso, Luiz Mário de Matos Jorge	Simulation and analysis of periodic and conventional drying of soybeans in fixed bed
P7	Rafael Oliveira Defendi, Gisleine Elisa Cavalcante da Silva, Paulo Roberto Paraíso, Luiz Mário de Matos Jorge	The initial grain moisture effect on soybean drying curves and mass transfer coefficients
P8	Joanna Bigda, Krzysztof Slowik, Karina Ignasiak	Experimental and numerical investigation of coal drying in new type of impact dryer.
P9	Mulugeta Admasu Delele, Fabian Weigler, Holger Scaar, Georg Franke, Jochen Mellmann	Modelling of air and solid flow in a rotary dryer for agricultural products
P10	Guangyuan Jin, Min Zhang, Zhengwei Cui, Qifeng Zhong	Fluid Dynamic Study on Spout Elevation of a Gas-Particle Spouted Fluidization Bed in Microwave-Vacuum Dryer
P11	Imen Hammouda, Daoued Mihoubi	Thermo-hydro-mechanical modeling of combined convective, microwave and infrared drying of saturated porous material.
P12	Csaba Mészáros, Istvan Farkas, Klaus Gottschalk, Ágnes Bálint	Novel-type solutions of convection-anomalous diffusion equation for porous media
P13	Zdzisław Pakowski, Sławomir Kwapisz	A single particle model for superheated steam drying of low rank coal at high pressure.
P14	Thiago Pádua, Rodrigo Béttega	CFD simulation of a spouted bed feeder into a riser
P15	Beatriz Silvério, Isabela Resende, Kássia Santos, Cláudio Duarte, Marcos Barrozo	Effect of the friction, elastic and restitution coefficients on the fluid dynamics behavior of a rotary dryer operating with fertilizer
P16	Loubna Kahlerras, Thiery Salmon, Federique Michel, Luc Courard, Azeddine Belhamri, Angélique Léonard	Modelling heat and mass transfer during convective drying of a building material
P17	Nour-Eddine Benaouda, Belkacem ZEGHMATI, Xavier Chesneau, Abdellah Khellaf	Performances evaluation of a modular solar dryer
P18	Zhanyong Li, Shaotie Wang, Jin Wang, Xinyuan Gao, Qing Xu	Application of reaction engineering approach to modeling of drying of green beans in a fluidized bed with slotted gas distributor
P19	Qing Xu, Hang Yin, Mianhua Chen, Ruifang Wang, Arun S. Mujumdar	Effect of pulsed steam flow on ethanol separation in solid-state fermentation process
P20	Ruifang Wang, Zhe Wang, Huihui Huo, Qing Xu, Zhanyong Li	Improvement of electromagnetic field uniformity in a microwave rotary dryer
P21	Hiroyuki Kagami	More minute thickness control of a thin film after drying through temperature, evaporation and concentration management in drying process of a polymer solution coated on a flat substrate
P22	Hedi Romdhana, Charlene Lambert, Daniel Goujot, Francis Courtois	Comparing simulations from compartmental and classic PDE approaches to model drying of food solids
P23	E Hernandez-Bautista, S Sandoval-Torres, P Felipe de Jesus Cano-Barrita, J Rodriguez-Ramírez.	Heat and moisture transfer with hydration reaction in a cement-based material during a curing/drying process with water vapor
P25	Toma Chitu, Séverine Vessot, Roman Peczański, Julien Andrieu, Bertrand Woinet, Alain Françon	Influence of operating conditions on the freeze-drying of frozen particles in a fixed bed and modelling data

2 - Thermodynamic and transport properties of materials		
P26	Giovanni Di Muio, Niels S. Tiedje, Bjørn B. Johansen	Investigation of moisture levels in water based foundry coating and furan sands using an automatic vapor sorption analyzer
P27	Mona Edrisi Sormoli, Timothy A.G. Langrish	GAB parameters for spray-dried pure orange juice powder
P28	Anders Haubjerg, Benny Simonsen, Sti Løvgreen, Bo N. Jørgensen, Christian T. Veje	Prediction of mechanical durability of dried, extruded fish feed using structural mechanics models and experimental justification of relaxation times
P29	Banu Koç, Figen Kaymak-Ertekin	Glass transition and sorption behaviour of spray dried maltodextrin
P30	Robert Adamski, Zdzisław Pakowski, Anna Kamińska	Experimental investigation of sorption isotherm and surface area of silica hydrogel.
P31	Boumediene Touati, Karima Mir, Amel Saad, Asma Abdenbi, Said Bennaceur	Moisture sorption isotherms of the desert truffle (<i>Tirmania pinoyi</i>)
P32	Hugo Perazzini, Fábio Bentes Freire, José Teixeira Freire	Interrelations between theory and experiment in drying kinetics of inorganic particulate compounds
P33	Acácia Lima, Leonardo Machado, Luciano Monteiro, Álvaro Lima, Odelsia Alsina	Osmotic dehydration of mangaba (<i>Hancornia speciosa</i>)
P34	Gustavo Dias Maia, Ana Laura Pelizer Pelegrin, José Teixeira Freire	Determination of adsorption-desorption isotherms of brazilian barley kernels
P35	Xin Jin, Xiao Dong Chen	Intuitive exploration of shrinkage mechanism and drying mechanism during drying of biological materials
P36	Manel Ben Abdelhamid, Daoued Mihoubi, Jalila Sghaier, Ahmed Bellagi	Convective drying of hardened cement paste: Experimental characterization and drying kinetics
P37	Ayihaou Armand Djossou, Comlan Aristide Houngan, Aliou Moussa Djibril, Malahimi Anjorin, Antoine Vianou	Comparative study of thermal effusivity and thermal conductivity at various moisture content of two tropical wood species used as building materials
P38	Said benaceur, Belkacem Draoui, Lyes Bennamoun, Boumediene Touati	Determination of moisture sorption-isotherms of leaves (<i>Waronia saharae</i>) harvested in the Algerian Sahara
P39	Charlene Lambert, Hedi Romdhana, Francis Courtois	Toward another method to determine effective diffusion coefficient in food-stuffs
P40	Rosa Zabalaga, Natalia Piedemonte, Livia Carvalho, Carmen Tadini	Equilibrium moisture and sorption isotherms of unripe banana
P41	Mariana Pereira, Veronica Flammia, Livia Carvalho, Carmen Tadini	Study of osmotic dehydration of green banana (<i>Musa cavendishii</i>) using non caloric solutions
P42	Wanyr R. Ferreira, Mauri Fortes, Luiz Cláudio A. Crespo	Evaluation of transport coefficients for natural and mixed convection drying of a horizontal cylinder
P43	Loubna Kahlerras, Frederic Michel, Luc Courard, Thierry Salmon, Lyes Bennamoun, Azeddine Belhamri, Angélique Léonard	Experimental study of the drying kinetics of mortar
P44	Ali Zerrouati, Martine Rueff, Bachir Bouchekima	Experimental study and modelling of desorption isotherms of papers made of bleached kraft pulps
P46	Luis A. Segura, Daniela L. Garrido, Fabiola V. Villagra, Guillermo G. Badillo	The effect of capillary pressure on shrinkage during drying. Experiments on 2D deformable micromodels.
P47	Abdelouahab Benseddik, Ahmed Azzi, Karim Allaf, Lazhar Serir, Farouk Chellali	Elaboration cards iso-values of meteorological variables influencing the process of solar drying in Algeria
P48	Emna Bettaieb, Lamine Hassini, Amira Touil, Mohamed Afif Elcafsi	Desorption isotherms of prickly pear seeds and effect of drying conditions on the quantity and quality of its oil
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Université Claude Bernard Lyon 1
Cellule Congrès—Bâtiment GEODE—R1
2 rue Raphaël Dubois 69622 Villeurbanne Cedex
Tél. : 04 72 43 35 90