

8th European Drying Conference



LODZ EUROPEAN N DRYING CONFERENCE YING CONFERENCE RENCE

Conference Programme

Lodz University of Technology
4-7 July 2023, Poland

Organizers:



Lodz University of Technology



www.eurodrying2023.p.lodz.pl



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July 4th, Tuesday

16:00	19:00	Registration- Alchemium, building number A34, 114 Żeromskiego street	
17:00	19:00	Welcome Reception	

July 5th, Wednesday

08:30	09:00	Registration- Alchemium, building number A34, 114 Żeromskiego street
09:00	09:20	Opening of the conference

Scientific Session 1

chairpersons: Juan A. Carcel, Patric Perre

Authors

09:20	09:50	Keynote Lecture: Decarbonizing Industrial Drying – The Role of Academic Institutions	Jamal YAGOOBI
09:50	10:10	Probabilistic optimization of industrial wood drying considering energy consumption; process duration and quality	Antoine STÉPHAN, Patrick PERRÉ, Clément L'HOSTIS, Romain RÉMOND
10:10	10:30	Developments in scale-up of industrial drying processes	Ian C. KEMP
10:30	10:50	Investigation of effective medium theories in the far infrared for pulp and paper applications	Jacob BOUCHARD, Doug PETKIE
10:50	11:10	Physico-chemical and textural properties of selected plant materials dehydrated using hybrid freeze-drying	Klaudia MASZTALERZ, Adam FIGIEL, Krzysztof LECH, Aneta WOJDYLO, Antoni SZUMNY
11:10	11:30	Coffee break	

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Scientific Session 2			Authors
chairpersons: Adam Figiel, Alex Martynenko			
11:30	11:50	Non-destructive monitoring of freeze-drying process of microparticles using microwave resonance spectroscopy	Kyuya NAKAGAWA, Kazuki BABA, Shinji KONO
11:50	12:10	Pore network simulation of heat and mass transfer during freeze-drying of porous media	Nicole VORHAUER-HUGET, Maximilian THOMIK, Sebastian GRUBER, Petra FÖRST, Evangelos TSOTSAS
12:10	12:20	Industrial Presentation: Electrostatic spray drying: a sustainable technology for thermosensible powder	Audrey MAUDHUIT, Elodie BEAUPEUX, Jean-Maxime EDORH, Preethi JAYAPRAKASH, Claire GAIANI, Stephane DESOBRY
12:20	12:40	Freeze-drying of pharmaceuticals in vials nested in a rack system	Fiora ARTUSIO, Marco ADAMI, Antonello A. BARRESI, Davide FISSORE, Maria Chiara FRARE, Claudia I. UDRESCU, Francesco ZANETTI, Gabriele ZUNINO, Roberto PISANO
12:40	13:00	Ultrasound-assisted atmospheric freeze drying for low temperature drying applications	Henry SABAREZ, Piotr SWIERGON, Kai KNOERZER
13:00	14:30	Lunch	

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14:30	16:00	Poster Session/Lab Tour	
16:00	16:30	Coffee break	
Scientific Session 3			
chairpersons: Kyuya Nakagawa, Henry Sabarez			Authors
16:30	17:00	Keynote Lecture: Combined application of PEF and ultrasound on drying process	Juan CÁRCEL CARRIÓN
17:00	17:20	Large scale drying in superheated steam under pressure of beet pulp is the way to CO ₂ neutral sugar production	Arne Sloth JENSEN
17:20	17:30	Industrial Presentation: CEE Energy Payback Project	Geert RAYMAEKERS
17:30	17:50	Is multispectral imaging a potential alternative to hyperspectral imaging to monitor the drying process of foodstuff?	Arman AREFI, Sharvari RAUT, Tina NURKHOERiyATI, John NDISYA, Oliver HENSEL, Barbara STURM
17:50	18:10	The potential of AI in industrial drying	Alex MARTYNENKO, Seyed Hassan Miraei ASHTIANI
A walk tour on the main street of Lodz			

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July 6th, Thursday

Scientific Session 4

chairpersons: Ian Kemp, Jamal Yagoobi


Authors

09:00	09:30	Keynote Lecture: Does it make sense to apply air dehumidification during spray drying?	Katarzyna SAMBORSKA
09:30	09:50	Effect of the spray drying conditions in the microencapsulation of oil using orange by-products	Mónica UMAÑA, José BON, Paweł WAWRZYŃIAK, Valeria EIM, Susana SIMAL
09:50	10:10	Guid to numerical simulation of particle deposition in spray dryers	Sara Moradi MARYAMNEGARI, Maciej JASKULSKI, Ali ASHRAFIZADEH
10:10	10:20	Industrial Presentation: Advances in the scaling up / industrialization of pulse combustion drying technology: Ekonek	Aritz LEKUONA, Mikel ALBERDI, Sebastian QUEREJETA, Raquel BAIGORRI, Antonio FOENKINOS
10:20	10:40	Understanding the operating limitations of an inner-mixing air-core-liquid-ring (ACLR) nozzle for process intensification in spray drying	Miguel Angel BALLESTEROS MARTINEZ, Volker GAUKEL
10:40	11:00	Influence of solution properties on powder morphology during co-current spray drying	Weronika BAŁDYS, Maciej JASKULSKI, Marcin PIĄTKOWSKI, Artur LEWANDOWSKI, Michał KREMPSKI-SMEJDA
11:00	11:20	Impact of the drying rate on product properties of spray dried emulsions to enable a targeted product design	Sebastian HÖHNE, Volker GAUKEL
11:20	11:40	Coffee break	

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Scientific Session 5			Authors
chairpersons: Katarzyna Samborska, Trygve M. Eikevik			
11:40	12:00	Experimental setup for measuring drying of molded fiber under near airless conditions	Michel VAN DER PAL, Simon SMEDING, Anton WEMMERS
12:00	12:20	Novel single droplet drying set-up to simulate temperature-time trajectories of a spray dryer	N.M. EIJKELBOOM, K. GAWRONSKA, J.M. VOLLENBROEK, G.J.C. KRAAIJVELD, R.M. BOOM, P.F.C. WILMS, M.A.I. SCHUTYSER
12:20	12:40	Drying wood-based waste in a fountain dryer of own design and mathematical modeling	Konrad ROJCEWICZ, Zbigniew OKSIUTA, Fabian DAINOWIEC
12:40	13:00	Investigation on nozzle zone agglomeration during spray drying using response surface methodology	Anneloes P. VAN BOVEN, Santiago M. CALDERON NOVOA, Reinhard KOHLUS, Maarten A. I. SCHUTYSER
13:00	14:30	Lunch	

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Scientific Session 6			Authors
chairpersons: Avi Levy, Tibor Poós			
14:30	15:00	Keynote Lecture: Integration of heat pumps in drying system	Trygve M. EIKEVIK
15:00	15:20	Unravelling the influence of convective drying on the quality of cabbage seeds	Julia VESER, Jochem VAN DER TUIN, Ruud VAN DER SMAN, Maarten SCHUTYSER
15:20	15:40	A new method for drying time determination of refine salts in a continuous fluidized bed dryer	Thanh Trung BUI, Khoi Hoang NGUYEN, Phu Quang PHAM, Nghia Hieu NGUYEN
15:40	16:00	Extended van Meel model to predict the drying behaviour of highly deformable products	Giana ALMEIDA, Patrick PERRE
16:00	16:20	Drying of sugar beet pulp to obtain a natural ingredient for food applications	Sheila RUIZ-BARBERO, Ana ROVALINO-CORDOVA, Vincent MEUNIER, Jean-Claude DELASOIE, Lisa LAMOTHE, Silke ILLMANN, Simon LIVINGS
16:30	17:30	WPD members meeting	
19:00	00:00	Banquet Vienna House Andel`s Łódź Ogrodowa 17, 91-065 Łódź	

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July 7th, Friday			
Scientific Session 7			
chairpersons: Angelique Léonard, Abdolreza Kharaghani			Authors
09:00	09:30	Keynote Lecture: Mechanistic modeling of the drying of solids: state-of-the-art and perspectives	Patrick PERRE, Romain REMOND, Giana ALMEIDA, Pedro AUGUSTO, Ian TURNER
09:30	09:50	Troubleshooting and problem-solving in industrial dryers	Ian C. KEMP
09:50	10:10	Electrostatic effect on the drying of a single droplet	Akaber DOKMAK, Audrey MAUDHUIT, Thomas DELEAU, Patricia ARLABOSSE, Maria Ines RE
10:10	10:30	Evolution of pore structure during the drying of porous media	Jing CHEN, Xiang LU, Abdolreza KHARAGHANI
10:30	10:50	Convective drying of potato pre-treated with ultrasound-assisted vacuum impregnation: process kinetics and products quality	Justyna SZADZIŃSKA, Elżbieta RADZIEJEWSKA- KUBZDELA, Róża BIEGAŃSKA- MARECIK, Tomasz LENARTOWICZ, Dominik MIERZWA
10:50	11:00	Industrial Presentation: Dedert International A/S	Łukasz KAŁUŻA
11:00	11:20	Coffee break	

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Scientific Session 8			Authors
chairpersons: Susana Simal, Pedro Augusto			
11:20	11:40	Modelling of the papermaking process under air-less drying conditions	Wouter DE VRIES, Jochem JONGERIUS, Michel VAN DER PAL
11:40	12:00	Modeling and electric energy-saving control design of hybrid solar dryer - experimental validation	Nawfal HIDRA, Hajar DOUBABI, Naji ABDENOURI, Said DOUBABI
12:00	12:20	Industrial Presentation: Presentation of the OMNIKON company	Zdzisław PAKOWSKI, Rafał KOSSAKOWSKI
12:20	12:40	Microwave heating as a possible route for the defossilization of green brick drying	Lucas BRIEST, Prajwal DHARMANANDA, Anne TRETAU, Ralf WAGNER, Evangelos TSOTSAS, Nicole VORHAUER-HUGET
12:40	13:00	Impact of greenhouse drying on nutrient quality and drying kinetics of black soldier fly (<i>Hermetia illucens</i>) larvae	Manal LEHMAD, Youssef EL HACHIMI, Patrick LHOMME, Safa MGHAZLI, Naji ABDENOURI
13:00	13:30	Closing of the conference	
13:30	15:00	Lunch	



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POSTER SESSION

Łódź 4-7 July 2023
POLAND



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Poster session		
Poster Number	Poster Title	Authors
1	Drying kinetics of molded pulp product with microwave drying technology	Ziliang ZHANG, Lingbo KONG, Yang SONG, Junzhong CHEN
2	Electrohydrodynamic-assisted drying technologies	Alex MARTYNYENKO, Tadeusz KUDRA
3	Energy-saving thermalvacuum drain with its simultaneous disinfestation	Volodymyr KUTOVYI
4	Evaluation of Bio-active compounds and Color Retention in Solar Dried Mexican Fig: Merit of UV-Blue Blocking Filters	Ekene Francis ORANUSI, Anabel LOPEZ ORTIZ, Nair P.K
5	Influence of thickening and drying process parameters on selected properties of food lactose obtained under industrial conditions	Sylwia GRECH, Fabian DAINOWIEC
6	In-situ analysis of the 3-D microstructure and its impact on the freeze-drying kinetics	Sebastian GRUBER, Maximilian THOMIK, Nicole VORHAUER-HUGET, Frederik COPPENS, Evangelos TSOTSAS, Petra FOERST

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7	Spray drying of slurry droplets: effect of acoustic field and gas absorption	Yehonatan DAVID POUR, Boris KRASOVITOV, Andrew FOMINYKH, Ziba HASHEMLOO, Abdolreza KHARAGHANI, Evangelos TSOTSAS, Avi LEVY
8	Analysis of maltodextrin and coffee powder properties produced by flame spray drying process	Mariia SOBULSKA, Marcin PIĄTKOWSKI, Edyta MUSZYŃSKA, Ireneusz ZBICIŃSKI
9	Influence of cell disintegration index caused by pef in ultrasonically assisted convective drying of turnip kinetics	Beatriz LLAVATA, Gabriela CLEMENTE, Carmen ROSSELLÓ, Juan A. CÁRCCEL
10	Modelling of water sorption isotherms of dehydrated coffee beans using machine learning techniques	Gentil A. COLLAZOS-ESCOBAR, Nelson GUTIÉRREZ-GUZMÁN, Henry A. VÁQUIRO-HERRERA, José BON, Juan A. CÁRCCEL, José V. GARCÍA-PERÉZ
11	Heat transfer coefficient for water evaporation	Evelin VARJU, Tibor POÓS
12	Effect of phase change capsule as carrier particles on spray-freezing drying process	Ruixin WANG, Jingjing WANG, Qing XU, Wei TIAN, Zhonghua WU
13	Determination of moisture content in food products	Izabela GORTAT, Joanna MARSZAŁEK

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14	Experimental study on the drying and quality effect of basilic (ocimum basilicum l.) incorporation in macaroons production	Miloud LAHBARI, Amina MENASRA, Djamel FAHLOUL, Hemza KHERCHOUCHE
15	Organic acids retention during continuous and intermittent drying of cocoa beans	Jader RODRIGUEZ CORTINA, Margaret SANTANDER, Henry VÁQUIRO, Sebastian ESCOBAR
16	Mathematical modelling of humid drying from a heterogeneous particle bed	Nicholas MCCARTHY, Frans MULLER, Andrew E. BAYLY
17	EHD augmented infrared drying of courgette	Józef WARECHOWSKI, Ewelina CHOMEJ
18	Freeze-drying of strawberries - analysis of conditions and modeling of the process	Joanna MARSZAŁEK, Halina MARCZAK, Maciej JASKULSKI, Paweł WAWRZYŃIAK
19	An experimental study on drying of single liquid droplets surrounded with gas mixtures	HASHEMLOO, Z., DAVID POUR, Y., KRASOVITOV, B., FOMINYKH, A., LEVY, A., TSOTSAS, E., KHARAGHANI, A.
20	Modelling the drying behaviour of single droplet maltodextrin in aqueous solution	Faridatul Ain Mohd ROSDAN, Tariq MAHMUD, Peter John HEGGS, Muza mmil ALI

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21	Innovative non-contact method for temperature measurement of droplets and particles in dispersed systems	Maciej JASKULSKI, Marcin PIĄTKOWSKI, Robert OLBRYCHT
22	Ultrasound-assisted vacuum impregnation of fruit with vitamin C followed by drying process	Justyna SZADZIŃSKA, Elżbieta RADZIEJEWSKA- KUBZDELA, Róża BIEGAŃSKA-MARECIK, Dominik MIERZWA
23	Dimensionless equation for the volumetric heat transfer coefficient in fluidized bed drying	Tibor POÓS, Viktor SZABÓ
24	A new technique for the physical elimination of aspergillus flavus spores before grain drying	Yi JIN, Ke HU, Zhihui QI, Jun YIN, Zhongjie ZHANG
25	Non-destructive monitoring of dry-salting of beef loins using ultrasonic techniques	Virginia SANCHEZ-JIMENEZ, Lola FARIÑAS, Tomas E. ALVAREZ-ARENAS, Jose BENEDITO, Jose V. GARCIA-PEREZ
26	The effects of microwave on the drying and physicochemical characteristics of ramps and rhubarb	Meltem DEMİR, Naciye KUTLU
27	Thermal effect of airborne ultrasound application during pork liver drying	SÁNCHEZ-TORRES, E.A., DALMAU, E BENEDITO, J., BON, J., GARCÍA-PÉREZ, J.V.

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28	CFD simulations of agglomeration in counter-current spray drying with fines return	Johannes Vincent BÜRGER, Maciej JASKULSKI, Abdolreza KHARAGHANI
29	Prediction of spray dried product properties using machine learning algorithms	Farooq HUSSAIN, Faizan ALI, Maciej JASKULSKI, Marcin PIĄTKOWSKI, Evangelos TSOTSAS
30	Steering particle agglomeration in spray drying - effect of processing parameters	VAN BOVEN A., CALDERON NOVOA S., KOHLUS R., SCHUTYSER M.
31	Modelling of a fountain bed dryer for maximising its drying efficiency	SUKUNZA X., ROJCEWICZ K., MARTÍN A., BOLAÑOS M., TELLABIDE M., DAJNOWIEC F., OKSIUTA Z., OLAZAR M.
32	Monitoring the hot air-drying process of Turnip slices using computer vision technology	Zakaria TAGNAMAS, Ali IDLIMAM, Abdelkader LAMHARRAR
33	Ultrasound assisted drying of fermented beetroot chips: Drying kinetics and quality of dried chips	STANISZEWSKA I., LLAVATA B., CÁRCEL J. A., ZIELIŃSKA M.
34	Encapsulation of bioactive compounds extracted from apple by-products by freeze-drying and spray-drying using different coating materials	Esperanza DALMAU, Valeria EIM, Susana SIMAL, Antoni FEMENIA

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35	Influences of Extracellular Polymeric Substances (EPS) on Settling; Dewatering and Drying of Sewage Sludge treated with indigenous microalgae	BEN HAMED H., SALMON T., TOYE D., LÉONARD A.
36	Is it possible to reduce carrier content in raspberry powder by the application of dehumidified air-assisted spray drying?	Alicja BARAŃSKA, Aleksandra JEDLIŃSKA, Dorota WITROWA-RAJCHERT, Katarzyna SAMBORSKA
37	Prototype of an Arduini-Controlled Convective Geothermal Dryer	BENAOUDA N., ZEGHMATI B., OUALI S.
38	Spray drying of biopolymer single droplet	Belal AI ZAITONE
39	Thermodynamic Analysis of Water Sorption of Pomegranate Peels as Function of Moisture Content	BEN SLIMANE N., BAGANE M., MULET A., CARCEL J.A.
40	Using of a micro-drying system to characterize the convective drying behavior of hydroxyde sludges	A. FANTASSE, A. LÉONARD, E.L.LAKHAL, S.P.ANGARRITA
41	Computer vision to characterise shrinkage of medicinal plant	Amel FEDOL, Naima BERBAOUI, Abdelkrim CHERITI
42	Mixing of sub-micron particles in a spouted bed	Subash R. KOLAN, Rui WANG, Torsten HOFFMANN Evangelos TSOTSAS

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43	Dynamic Drying Silo of Spray Freeze Drying and Its DEM Simulation Analysis	Haonan ZHAI, Runling PENG, Wei WANG, Jinyue LIU, Junde GUO
44	Utilizing residual raw material from marine biomasses and sugar kelp (<i>Saccharina Latissima</i>): preprocessing; drying and consumer acceptance	CLAUSSEN I.C., TOLSTOREBROV I., GACEU L., OPREA O.B., EIKEVIK T.M.
45	Using CFD-TFM approach for modelling the pulsed fluidized bed of refined standard sugar	Pham Quang PHU, Bui Trung THANH, Le Anh DUC, Todor DJOURKOV
46	Experimental Study on Pulse Combustion Spray Drying of Various Liquid Materials	WU Z. H., LI Y., YANG Y.J., XU Q., SONG J.T.
47	Thin layer drying kinetics of carrot (<i>Daucus carota</i>) in a natural convection UV blocked greenhouse solar dryer	Nicolás-Iván ROMÁN-ROLDÁN, Anabel LÓPEZ-ORTIZ, Jean-Fulbert ITUNA-YUDONAGO, P. K. NAIR, Ekene FRANCIS-ORANUSI
48	Simulation of food drying in a CAPE-OPEN software	ROMDHANA H., GOUJOT D.
49	Optimization of strawberry concentrate spray drying at low and high temperature to obtain powders of enhanced properties	JEDLIŃSKA A., BARAŃSKA A., WIKTOR A., WITROWA-RAICHERT D., TYLEWICZ U., SAMBORSKA K.
50	Digitalised Strategies for Product Development and Optimisation of Commercial Scale Spray Drying	Keith SMITH

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51	Modeling heat and mass transfer for cake baking	P. EL HELOU, P. LE BIDEAU, A. FUENTES, P. GLOUANNEC
52	On the drying shrinkage of concrete structures	Abdelmalek BRAHMA
53	Product properties in a two-nozzle spray drying system.	KREMPSKI-SMEJDA M., SOBULSKA M., PIĄTKOWSKI M., JASKULSKI M., ZBICIŃSKI I., WAWRZYŃIAK P.
54	Determination of effective moisture diffusivity and drying kinetics for low-temperature dried alginate beads.	KREMPSKI-SMEJDA M., SUTOWICZ, J., KROPIWŃICKI W., RZEPKOWSKA M., SAKOSIK M., KOWALSKA J., WAWRZYŃIAK P.
55	Pulsed Electric Field pre-treatment improves different drying methods performance of Chilean abalone (<i>Concholepas concholepas</i>)	LEMUS-MONDACA, R., MARIO PÉREZ-WON, KLAUDIA MASZTALERZ, K., GIPSY TABILO-MUNIZAGA
56	Energy efficiency improvement by biomass predrying with utilization of waste heat from drying in biomass fired power plants	HAVLÍK J., DLOUHÝ T.
57	H2020 PREMIUM project: Preserving bacteria with oligosaccharides and eco-friendly processes	PASSOT S., GOMEZ-ZAVAGLIA A., CASTILHO P., PÉNICAUD C., SIMÕES P.N., LOZA-ALVAREZ P., MARRO M., KILBRIDE P., DIAZ MORILLO C., FONSECA F.

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58	Energy aspects of hybrid freeze-drying	FIGIEL, A., MASZTALERZ K., LECH K.
59	Investigation of Particle Coating by means of Aerosol in Fluidized Beds	AKBAS S., CHEN K., HOFFMANN T., SCHEFFLER F., TSOTSAS E.
60	Simulation of walnut drying under hot air using a multi-layer nonequilibrium multiphase transfer model	Chang CHEN, Ragab KHIR, Ruihong ZHANG, Zhongli PAN
61	Structural Effects of Phase Transitions in the Drying of Acoustically Levitated Surfactants Droplets	WINDER R., HARBOTTLE D., BAYLY A., KHODAPARAST S., RAPPOLT M., MCROBBIE I.
62	Freeze-drying process of Ni/Y2O3 nanocomposite processed by ultrasonic spray pyrolysis	WINDER R., HARBOTTLE D., BAYLY A., KHODAPARAST S., RAPPOLT M., MCROBBIE I.
63	Effect of solar radiation and full spectrum artificial sun light on textural properties of Asian white radish (<i>Raphanus sativus</i> L.)	Pratik NAYI, Tzou-Chi HUANG, Fu- Yuan MA, Navneet KUMAR, Ho- Hsien CHEN
64	Impact of Foam-Mat Drying on Water Vapour Adsorption Isotherm of Starch-Albumen Powder	GBAGBA K.F., SHITTU T.A., BABAJIDE J.M., SOGUNLE O.M.

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65	Experimental and numerical study of modeling of spray generation by spray drying process.	Timi GOMBOC
66	Multi-level simulation of drying kinetics during lyophilization	Blaž KAMENIK, Jure RAVNIK, Matjaž HRIBERSEK, Matej ZADRAVEC
67	Thin-Layer Drying Behavior of Foamed Starch-Albumen Slurry: Effect of Starch Inclusion; Drying Temperature and Blower Speed	ADEDOTUN H., SHITTU T.A., SOBUKOLA O.P., SOGUNLE O.M.
68	Rapid Drying of Biologicals at Room Temperature	MEZHERICHER M., STONE H.A.
69	Research on integrated technology of grain cleaning and drying	YI JIN, KE HU, ZHONGJIE ZHANG
70	Influence of ethanol pretreatment on convective drying kinetics and quality of pear (<i>Pyrus Communis</i>)	Dominik MIERZWA, Kinga KOLIMECZKOW, Joanna ŁECHTAŃSKA, Justyna SZADZIŃSKA
71	Design and built of a Superheated Steam Dryer with heat pump	RAYMAEKERS G., DRIESSEN J.
72	Sensory quality of an osmo-dehydrated orange subjected to different osmotic solutions	WITROWA-RAJCHERT D, DADAN M., RYBAK K., TRUSINSKA M., YAZIDI R., NOWACKA M.

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73	The effect of PEF treatment and ultrasound assisted drying on the chosen physical properties of apple tissue	TRUSINSKA M., DADAN M., RYBAK K., NOWACKA M.
74	Drying woody biomass in air atmosphere using “rolling-bed” pilot scale dryer as pre-process for superheated steam torrefaction process – kinetics and efficiency	SZUFA S., PIERSA P., ADAMSKI R., JUNG R.
75	Drying characteristics of fortified carrot pomace blended dehydrated sweet corn porridge	Pratik NAYI, Navneet KUMAR, Ho-Hsien CHEN
76	Microwave Drying of Mint Leaves with Volatiles Recovery	Rahul CHETRY, Parag Prakash SUTAR
77	Vacuum steam pulsed blanching and refractance window drying of fresh spinach	DURGAWATI, Parag Prakash Sutar
78	Mathematical modelling of combined microwave-vacuum drying of Black Pepper (<i>Piper nigrum</i>) pretreated with steam	Piyush SHARMA, Arun Prasath VENUGOPA, Parag Prakash SUTAR
79	Integration of heat pumps in drying system	Eikevik, TRYGVE
80	Ultrasound assisted drying of apples – process kinetics, energy consumption and product quality	Joanna KROEHNKE, Grzegorz MUSIELAK