2nd CARL LOPER
CAST IRON SYMPOSIUM

Latest advances and applications of cast iron

SEPTEMBER 30th -OCTOBER 1st , 2019
Bilbao (Spain)

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Honoring Dr. Carl R. Loper Jr., professor of many professors, the focus of this conference is to review the fundamentals of cast iron solidification and highlight the latest research, technology and developments in metallurgy, production and applications of the material.

Taking advantage of the 10th anniversary of the 1st Carl Loper Symposium held at Madison, Wisconsin (USA), the 2nd Carl Loper Symposium is being organized by IK4-Azterlan Metallurgy Research Centre, SPAIN, and includes Key Note invited and contributed papers from leading academic and industrial community.

This event will be hold every three years with the scope to disseminate the latest advances and applications of cast iron.

Congress Theme: "LATEST ADVANCES AND APPLICATIONS OF CAST IRON"

The 2nd Carl Loper Symposium on Cast Iron Technologies will gather 40 scientific and industrial papers on the following fields of knowledge:

- Cast Iron (spheroidal, lamellar and compacted graphite cast iron, ADI and alloyed irons).
- Corrosion, environment and sustainability.
- Foundry technologies, equipment, manufacturing, tools, robotics and automation.
- Energy.
- Advanced engineering: design, calculation and simulation tools.
- Heat, cryogenic and surface treatments.
- Molding, core making and rapid prototyping technologies.
- Pattern and tool making.

Social events

- **Optional pre-tour to San Sebastian** on Sunday, September 29th, 2019
- **Conference** dinner on Monday evening, September 30th, 2019

Conference venue: EUSKALDUNA JAUREGIA BILBAO

Located in the center of Bilbao, near the Guggenheim Bilbao museum, it is easy access to many wonderful hotels allowing attendees to come on foot, Tran, Metro and less than 20 minutes away from Bilbao (BIO) airport.

Conference Board Members

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SYMPOSIUM FEES*

	Regular fee Until Sept. 1st	Late fee Sept. 2nd –16 th
Full fee (Professionals)	415€	470€
Students	225€	265€
Reduced fee (Scientific Committee, sponsors)	320€	375€
Conference dinner for accompanying person	100€	120€

(*) Applicants from Spain should add V.A.T. (21%) in all cases.
Included in the Registration fees: Conference dinner (Sept. 30th), coffee break snacks and luncheon.
Not included in the Registration fees: Accommodation, transport and trip to San Sebastián (Sept. 29th).

Registration, contact and further infomation

WEBPAGE. http://www.azterlan.es/en/carl-loper-symposium.html

TELEPHONE. (+34) 94 6215470 · **EMAIL.** CarlLoperSymposium@azterlan.es

SYMPOSIUM SECRETARY. Olatz Garro.

PRELIMINARY PROGRAM

MONDAY, SEPTEMBER 30TH

	Hall 1	Hall 2
8:00–09:00	Registration	
8:30–09:10	**Welcome.** *R. Suárez (IK4-AZTERLAN)*	
09:10–09:55	KNL **(Title to be defined).** *J. Fesch (SAKTHI-PORTUGAL)*	
10:00–10:20	**Innovative material concepts for lightweight design.** *E. Wüller, D. Engels, M. Vißer*	**Graphite degeneration in high Si, Mg-treated iron castings – sulphur and oxygen addition effects.** *D. Anca, M. Chisamera, S. Stan, I. Riposan*
10:25–10:45	**Time-evolution of solidification structure in ductile cast iron with hyper-eutectic compositions.** *K. Chatcharit, A. Sugiyama, K. Morishita, T. Narumi, H. Yasuda*	**Effect of cooling rate on graphite morphology and mechanical properties in high silicon ductile iron castings.** *B. Bauer, I. M. Pokopec, M. Petrič, P. Mrvar*
10:50–11:10	**3D-STEM observation of a multiphase nucleus of spheroidal graphite.** *A. Pugliara, L. Laffont, T. Hungria, J. Lacaze*	**Oxidation resistance of high silicon ductile cast irons with and without molybdenum and antimony additions.** *M. A. Arenas, S. Méndez, A. Niklas, R. González, A. Conde, J. Sertucha, J. J. de Damborenea*
	Coffee break	
11:30–11:50	**Solidification path of cast iron alloyed with 9% Al.** *A. Nofal, A. Rezk, N. Sobhy*	**Microstructure changes during solidification of cast irons - Effect of chemical composition and inoculation on competitive spheroidal and compacted graphite growth.** *A. Regordosa, U. de la Torre, A. Loizaga, J. Sertucha, J. Lacaze*
11:55–12:15	**Experimental simulation of solidification thick-walled ductile iron.** *C. Dommaschk, G. Wolf; N. Laskowski*	**Fracture micromechanisms evaluation of high strength cast irons under thermomechanical fatigue conditions.** *D. G. Bon, M. H. Ferreira, W. W. Bose Filho, W. L. Guesser*
12:20–12:40	**Computational modeling of shrinkage porosity formation in spheroidal graphite iron: a proof of concept and experimental validation.** *E. S. Kweon, D. H. Roh, S. B. Kim, D. M. Stefanescu*	**Microstructure of compacted graphite iron near critical shrinkage areas in cylinder blocks.** *A. K. Ramos, A. Diószegi, W. L. Guesser, C. S. Cabezas*
	Lunch	
14:00–14:35	KNL **New liner material for demanding two stroke marine engines.** *P. Samuelsson (MAN)*	
14:40–15:00	**Comparing sands from different reclamation processes for use in the core room of cylinder heads and cylinder blocks production.** *E. C. Silva, I. Masiero, W. L. Guesser*	**The role of primary austenite morphology in hypoeutectic CGI alloys.** *J. C. Hernando, J. Elfsberg, E. Ghassemali, A. K. Dahle, A. Diószegi*
15:05–15:25	**Effects of various elements on primary crystallization temperature and carbon equivalent of hypoeutectic cast iron.** *T. Kanno, Y. Iwami, I. Kang, S. Koriyama*	**Electron probe microanalysis improves understanding of the solidification kinetics of ductile and compacted graphite iron.** *B. Domeij, A. Diószegi*
15:30–15:50	**Effect of the starting microstructure in the formation of austenite at the intercritical range in ductile iron alloyed with nickel and copper.** *H. D. Machado, R. E. Aristizábal, C. Garcia-Mateo, I. Toda-Caraballo*	**Examination of the size and morphology of austenite grains in lamellar graphite cast iron.** *M. G. López, J. M. Massone, R. E. Boeri*
	Coffee break	
16:10–16:30	**Reclassification of spheroidal graphite ferritic pearlitic and ausferritic austempered ductile cast irons grades according to design needs.** *F. Zanardi*	**Pearlite refining strategies for hypoeutectic gray cast iron.** *M. L. Lima, E. Albertin, E. R. Correa, R. B. Rabello, S. Uehara*
16:35–16:55	**Application of ADI in a crushed coal delivery and filtering system.** *A. Rimmer*	**Volume change related defect formation mechanisms in lamellar graphite iron (LGI).** *P. Svidró*
17:00–17:30	**Austempered ductile iron with dual microstructures – effect of initial microstructure on the austenitizing process.** *W. L. Guesser, C. L. Lopes, P. A. N. Bernardini*	**On the thermal analysis and microstructure observations of titanium-alloyed gray iron.** *S. Boonmee, K. Worakhut*
17:35–17:55	**Effect of thermomechanical processing on structure and properties of dual-phase matrix of ADI with different Si-contents.** *A. Nofal, M. Soliman, H. Palkowski*	**The development of dual graphite iron by sulfurization method.** *S. Boonmee, S. Rassamipat*
18:00-18:20	**Product development of a high chrome white cast iron to yield consistent physical and mechanical properties.** *S. Mavhungu, D. Sekotlong, K. Mageza*	

(*) KNL: Keynote Lecturer

TUESDAY, OCTOBER 1ST

	Hall 1
8:00–08:30	Registration
08:30-09:05	KNL **What will be the role of cast iron in 15-20 years in the automobile?.** *M. Albertalli (Renault)*
09:10-09:30	**A user-friendly approach to feeder design for cast iron parts.** *T. V. Hoblea*
09:35-09:55	**Process improvements of ferritic ductile irons to achieve higher impact properties at subzero temperatures.** *K. Mageza, F. Canei, S. Mavhungu, C. Banganayi*
10:00-10:20	**The relation between the damping capacity and tensile strength of nodular cast irons for braking system components.** *I. Pereira, G. Alonso, V. Anjos, L. F. Malheiros, R. Suárez*
10:25-10:45	**Light-weighting technologies for high performance ductile iron sand castings.** *J. Shah*
	Coffee break
11:05-11:25	**Growth of spheroidal graphite: light versus scanning and transmission electron microscopies: a proof of concept and experimental validation.** *J. Bourdie, J. Lacaze, C. Josse, L. Laffont*
11:30-11:50	**Investigation of spheroidal graphite growth in solid state.** *D. M. Stefanescu, G. Alonso, R. Suárez*
11:55-12:15	**Effect of antimony on graphite growth in ductile iron.** *L. Dekker, B. Tonn, Gerhard Lilienkamp*
12:20-12:40	**Ultrafine spheroidal graphite iron castings by use of thin-walled permanent molds.** *H. Itofuji, K. Edane, T. Sakatani, M. Itamura*
	Lunch
14:00-14:35	KNL **Automotive powertrain trends and the market opportunity for cast irons.** *S. Dawson (SinterCast)*
14:40-15:00	**Influence of the high-power thermal plasma heating (HPTP) in the properties of the ductile iron foundry components.** *A. Rubio, K. Zabala, J. M. López*
15:05-15:25	**Discriminating between sound and defected ferritic ductile irons through tensile data analysis.** *G. Angella, M. Cova, G. Bertuzzi, F. Zanardi*
15:30-15:50	**Thermal fatigue testing of spheroidal graphite cast iron for HPDC.** *P. Mrvar, S. Kastelic, M. Terčelj, M. Petrič, B. Bauer, D. Mitrović*
	Coffee break
16:10-16:30	**Ductile iron front-end ultrasonic nodularity determination using standard coupons.** *J. Cree, M. Robles Jr., A. Hoover, N. Thornberry, S. Beckley*
16:35-16:55	**Velocity measurement and verification with modeling of naturally pressurized gating systems.** *K. Metzloff, K. Mageza, D. Sekotlong*
17:00-17:20	**Effect of magnesium on the solid-state nucleation and growth of graphite during annealing of white iron.** G. Alonso, D. M. Stefanescu, R. González, R. Suárez
17:25-17:45	**The effect of thermal processing and chemical composition on secondary carbide precipitation and hardness in high chromium cast irons.** *M. A. Guitar, U. P. Nayaka, D. Britza, F. Mücklich*
17:50-18:10	**New casting technologies: Ablation technology for iron casting.** *J. Garay*