

HIGH TECH DIE CASTING 2012

Innovation, Perspectives & Challenges
in Pressure Die Casting of Light Alloys

Vicenza, Italy
9-10 February 2012

Final Program
5th International Conference

Organized by
Light Metals & Diecasting
Study Groups of



ASSOCIAZIONE
ITALIANA DI
METALLURGIA

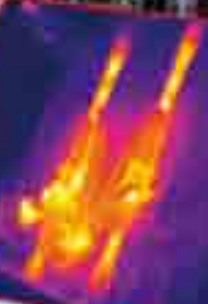
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In cooperation with



Dept. of Management
and Engineering
University of Padova
Vicenza Campus



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Franco Bonollo • DTG, Università di Padova, Italy

Piero Parona • Enginsoft, Italy

Giulio Timelli • DTG, Università di Padova, Italy



Throughout the years, the High Tech Die Casting Conference, whose first meeting was held in Vicenza in 2002, has become a key-event for the international industrial and academic community involved in casting processes of light alloys. HTDC has grown steadily through the following Conferences, organised in 2004, 2006 and 2008.

Now, due to the radical changes in the industrial scenario induced by a critical economic situation, it is clear that only the capability of integrating and applying a wide range of information and technologies will offer light alloys foundries the opportunity to be successful in a competition-dominated international arena.

To sustain the development of this capability, HTDC 2012 intends to offer foundries, suppliers and end-user, a comprehensive overview on the innovations (from alloys to processes, from design to applications), which are available to face the increasing demand for competitiveness, efficiency, high performance.

The scientific and technical program of HTDC 2012 was elaborated by a Scientific Committee, representing the most esteemed International Technical Associations involved in Die Casting and related technologies. HTDC 2012 will confirm itself as an exhaustive Conference concerning scientific, technical and management innovations in the field of Pressure DieCasting (including low and high pressure as well as squeeze and semi-solid technologies).

Papers and contributions will be presented by a very qualified panel of experts, both academic and industrial.

HIGH TECH
DIE CASTING
2012

Presentation





February 9, 2012

program

9.30 Opening Ceremonies

9.45 Opening Lecture

Thixoforming A201 aluminium alloy - is there a future in aerospace applications?

P. Kapranos - *The University of Sheffield, Sheffield, UK*

10.30 Overview of Poster Session

SESSION I: EVALUATING THE POTENTIAL OF DIECASTING ALLOYS

Chairman: Gian Luca Garagnani

10.45 Keynote

State-of-the-art characterization tools for Al foundry alloys

M. Di Sabatino, S. Akhtar, L. Arnberg - *Norwegian University of Science and Technology - NTNU, Trondheim, Norway*

11.10 **The synthesis of die-castable nano-particle reinforced aluminum matrix composite materials by in-situ gas-liquid reactions**

C. Borgonovo, M.M. Makhlof - *Worcester Polytechnic Institute, Worcester, USA*

11.30 **Influence of natural ageing on the artificial ageing response of Al-Si casting alloys**

E. Sjölander, S. Seifeddine - *Jönköping University - School of Engineering, Jönköping, Sweden*

11.50 **Creep behaviour of deep cryogenic treated AZ91 magnesium alloy**

E. Gariboldi, Q. Ge, N. Lecis - *Politecnico di Milano, Milano, Italy*

S. Spigarelli, M. El Mehtedi - *Università Politecnica delle Marche, Ancona, Italy*

12.10 **Evaluation of anisotropic mechanical properties of die-cast Zamak5**

A. Pola, R. Roberti - *Università degli Studi di Brescia, Brescia, Italy*

D. Rollez - *Grillo Werke Aktiengesellschaft, Duisburg, Germany*

12.30 Welcome buffet

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SESSION II: ADVANCED HPDC TOOLING AND EQUIPMENTS

Chairman: Piero Parona

- 14.00** Keynote
High thermal conductivity tool steels for die casting
I. Valls, A. Hamasaiid - *Roalma S.A., Terrassa, Spain*
H. Eibisch, R. Heid - *AUDI AG, Ingolstadt, Germany*
D. Casellas, S. Molas - *CTM Technological Centre, Manresa, Spain*
- 14.25** **Heat treatment and surface treatments for die casting aluminum dies**
A. Magnacca - *Bodycote Italia, Gorgonzola, Italy*
- 14.45** **The tool steel producer's contribution to successful die casting of structural components**
I. Schruff - *Kind & Co., Wiehl, Germany*
- 15.05** **Shot sleeve and plunger technology. Strategic choice for production of high quality castings**
A. Peli - *AR Consult di Peli Aldo & C., Manerba del Garda, Italy*
D. Brondolin - *Brondolin, Cassano Magnago, Italy*
- 15.25** Coffee break
- 16.00** **Nox OL 4200 S HPDC structural components machine, injection characteristics and process control features**
R. Boni - *Idra Group, Travagliato, Italy*
- 16.20** **Optimization of die venting design through analytical calculations**
A. Panvini - *Università di Brescia, Brescia, Italy*
C. Gislon - *Co.Stamp, Sironè, Italy*
- 16.40** **The ultimate die cast tooling system: plungers and shot sleeves in the high quality die casting with vacuum**
F. Miglierina - *Omina Tecno, Gallarate, Italy*
- 17.00** **HPDC simulation for the right machine. Less pressure, less force, less energy, less cost**
L. Valente - *Ecotre, Brescia, Italy*
- 17.20** **The automation for the production of structural and complex geometry castings: different solutions in die and gravity casting. Current constraints and future opportunities**
E. Codenotti - *Gauss Automazione, Rodengo Saiano, Italy*
A. Locati - *Italpresse, Capriano del Colle, Italy*
- 20.00** Conference Dinner



February 10, 2012

program

- 9.00** Opening Lecture
Production of hollow components in HPDC through the use of ceramic lost cores
R. Molina - *Teksid Aluminum, Carmagnola, Italy*
R. Moschini - *MAPROF, Bologna, Italy*
- SESSION III: FOUNDRY OF THE FUTURE**
Chairman: Lars Arnberg
- 9.45** Keynote
High pressure die casting: contradictions and challenges
F. Bonollo, G. Timelli - *Università di Padova - DTG, Vicenza, Italy*
N. Gramegna - *Enginsoft, Padova, Italy*
- 10.10** **The use of metal treatment to control the quality of an aluminium casting produced by the high pressure diecasting process**
R. Kendrick - *Foseco Europe, Tamworth, England*
G. Muneratti, S. Consoli - *Vesuvius Foundry Division, Vermezzo, Italy*
F. Voltazza - *Saen, Brugine, Italy*
- 10.30** Coffee break
- 11.00** **How to reduce the flash formation: deformation analysis about a LPDC mold in a thermal steady state**
D. Bianchi, L. Pirola - *Fonderie Mario Mazzucconi, Ambivere, Italy*
- 11.20** **The scrap reduction in diecasting through automatic optimization analysis**
A. Garlet - *Ferrolì, Alano di Piave, Italy*
G. Scarpa, N. Gramegna - *Enginsoft, Padova, Italy*
- 11.40** **Innovative solutions for HPDC of aluminium alloys**
N. Basile, V. Ilotte - *Fonderie 2A, Santena, Italy*

12.00 Advancements on the rheocasting route toward thin and thick automotive parts

M. Rosso, I. Peter - *Politecnico di Torino, Torino, Italy*

G. Chiarmetta - *Consultant, Torino, Italy*

I. Gattelli - *ATS, Lugo Ravenna, Italy*

12.20 Lunch

SESSION IV: DIECASTINGS WITH ENGINEERED SURFACES

Chairman: Mario Rosso

13.45 Keynote

Relation between die surface temperature and paint adhesion: a case history

F. Cecchetto, C. Raone, S. Salini - *Motultech Baraldi, Castel San Pietro, Italy*

14.10 Performance of plasma electrooxidation coatings for light alloys

R. Bayon, A. Igartua - *Tekniker-ik4, Guipúzcoa, Spain*

14.30 The new italian standard on painted aluminium diecastings: guidelines and examples

R. Boi - *Qualital, Novara, Italy*

14.50 Influence of injection parameters on the final surface quality of Al-Si-Cu die cast components

D. Casari, M. Merlin, G.L. Garagnani - *Università di Ferrara, Ferrara, Italy*

15.10 Cold spray technology for maintenance and repair of aluminium alloys aeronautical components

S. Vezzù, S. Rech, A. Trentin - *Associazione CIVEN, Marghera, Italy*

15.30 BEST POSTER AWARD AND CLOSING OF THE CONFERENCE

Effect of Al-3Ti-0.15C grain refiner and Al-10Sr modifier on A356 alloy slurry cast by RSF process

A. Sharma - *Malaviya National Institute of Technology, Jaipur, India*

Bee colony algorithm in robot automation of metalcasting foundry

R.S. Wadhwa, T. Lien - *NTNU, Trondheim, Norway*

Iron foundry automation

R.S. Wadhwa - *NTNU, Trondheim, Norway*

Structural components with vacuum technology in HPDC, LPDC and gravity die-casting

L. Valente - *Ecotre, Brescia, Italy*

Micromechanical analysis of residual thermal stresses in an uni-directional composite

M. Khaldi - *University of Mascara, Mascara, Algeria*

Z. Sereier - *University of Science and Technology Mohamed Boudiaf, Oran, Algeria*

Aluminium based components with enhanced characteristics through advances squeeze casting process

M. Rosso, I. Peter - *Politecnico di Torino, Torino, Italy*

R. Molina - *Teksid Aluminum, Carmagnola, Italy*

A. Montedoro, G. Tonno - *F.O.M.T., Grugliasco, Italy*

P. Claus - *Tecnopres, Chieri, Italy*

Optimization of a step casting die geometry to evaluate the potential mechanical performance of AM60B magnesium alloys

N. Facchinelli, G. Timelli - *Università di Padova - DTG, Vicenza, Italy*

L. Trevisan - *EnginSoft, Padova, Italy*

New approach for the synthesis of Al-based cellular materials

S. Vezzù, S. Rech, A. Trentin - *Associazione CIVEN, Marghera, Italy*

F. Bonollo - *Università di Padova - DTG, Vicenza, Italy*

Computed tomography as a promising solution for industrial quality control: how accurate is it?

S. Carmignato - *Università di Padova - DTG, Vicenza, Italy*

Design and realization of a experimental cold crucible levitation melting system for light alloys

G. Timelli, G. Chitarin, A. Tiziani, F. Bonollo - *Università di Padova - DTG, Vicenza, Italy*

Prediction of tensile properties of cast Al-Si-Mg automotive components

An. Morri, L. Ceschini, Al. Morri - *SMETEC - Dept. of Metallurgy, Bologna, Italy*

I. Todaro - *DIEM - Dept. of Mechanical Engineering Constructions, Bologna, Italy*

Advances in the determination of hydrogen concentrations in aluminium alloys

G. Muneratti - *Vesuvius Foundry Division, Vermezzo, Italy*

Friction stir processing for localized strengthening of die cast components

N. Sun, D. Apelian - *Worcester Polytechnic Institute, Worcester, USA*

Automatic working cells with two platen diecasting machines: advantages and technological innovations to produce automotive, structural, safety, complex geometry and large castings

A. Albertini, A. Benini - *Italpresse, Capriano del Colle, Italy*



CONFERENCE VENUE

The conference will be held at University of Padova buildings in Vicenza - Viale Margherita 87, Vicenza (Italy).

LANGUAGE

English will be the official Conference language. A simultaneous translation service (English-Italian) will be provided.

PROCEEDINGS

The proceedings will be published on CD-Rom and issued to delegates on arrival at the Conference.

REGISTRATION INFORMATION

Registration Fees (BEFORE January 13, 2012)

	Standard Rates	Aim Members Rates
Delegates:	Eur 460 (*)	Eur 380 (*)
Speakers (◆)/Academics/ Chairmen of the Session:	Eur 410 (*)	Eur 330 (*)
Students (◆◆):	Eur 250 (*)	Free

(*) Revenue Stamp Included

Registration Fees (AFTER January 13, 2012)

	Standard Rates	Aim Members Rates
Delegates:	Eur 560 (*)	Eur 480 (*)
Speakers (◆)/Academics/ Chairmen of the Session	Eur 510 (*)	Eur 430 (*)
Students (◆◆)	Eur 350 (*)	Free

(*) Revenue Stamp Included

ACCOMPANYING PERSONS

Eur 97 (VAT included) - Includes only welcome buffet and Conference dinner.

Conference Registration fees include admittance to technical sessions, Conference bag with CD-Rom proceedings, coffee breaks, welcome buffet (9 February), lunch (10 February) and Conference dinner (9 February). For non-members the fee includes AIM Membership for the year 2012. Cumulative registrations for over 3 delegates from the same company will entitle to a discount of 15% of the total amount. Cumulative registration forms should be sent together.

(◆) *Speakers are required to register and pay the Conference registration fee not later than 15 December 2011. Otherwise their paper will be removed from the programme and the proceedings.*

(◆◆) *Students will have to provide valid proof of student status. Student registration fee includes admittance to technical sessions, Conference bag with CD-Rom proceedings, coffee breaks, welcome buffet (9 February) and lunch (10 February). It does not include the Conference dinner.*

ADVANCED REGISTRATION

If you plan to attend, please fill in the registration form on the conference website (www.aimnet.it/htdc2012.htm) or the enclosed registration form and send in to the Conference Secretariat at your earliest convenience, but not later than **January 13, 2012**. Please use a separate form for each delegate. Photocopies can be used. Please contact the Conference Secretariat by e-mail (info.aim@aimnet.it), if possible.

PAYMENT AND REMITTANCE

- by non-transferable bank draft or cheque, negotiable in Italy, to the order of Associazione Italiana di Metallurgia (AIM).
- by bank transfer, to the order of Associazione Italiana di Metallurgia - AIM at "Banca Popolare Commercio e Industria", Branch no. 2 - Milano, Account no. 000000022325 - Code ABI 05048 - CAB 01602 - CIN L, IBAN: IT92L0504801602000000022325, swift code POCIITM1002. The transfer order must specify the name of the delegate and the reference "HTDC 2012". A copy of the transfer order must be sent to AIM, together with this Registration Form.
- by credit card online (www.aimnet.it/htdc2012.htm).

CANCELLATION AND REFUND POLICY

A refund, less 20% deduction for administrative costs, will be issued for written cancellations received **by January 20, 2012**. For attendees who notify their cancellation after January 20, 2012 or will not attend the conference, **a charge of 100%** of the Conference registration fee will be withheld and a copy of the proceedings will be sent after the event.

INSURANCE

The Organising Secretariat and University of Padova, Vicenza Campus, can not assume any responsibility for personal accident, loss or damage to the private property of participants and accompanying persons, which may either occur during or arise from the conference.

Participants should therefore take whatever steps they consider necessary as regards insurance.

VISA APPLICATION FORM

If you need an official invitation please send your request to the Organising Secretariat **before January 13, 2012** complete with family and first name, birth date, passport number, arrival and departure dates, nationality and Italian Embassy fax number.

SUGGESTED HOTEL

Please make your hotel reservation at your earliest convenience.

There will be no official Conference agency.

Hotel Palladio (★★★★)

Via Contrà Oratorio dei Servi 25
36100 Vicenza
Tel +39 0444 325347
Fax +39 0444 393632
www.hotel-palladio.it

Albergo Campo Marzio (★★★★)

Viale Roma 21
36100 Vicenza
Tel +39 0444 545700
Fax +39 0444 320495
www.hotelcampomarzio.com

Hotel Continental (★★★)

Viale G.G. Trissino 89
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Fax +39 0444 513319
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36100 Vicenza
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Fax +39 0444 543656
www.hcristina.it

Hotel Giardini (★★★)

Viale Giuriolo 10
36100 Vicenza
Tel +39 0444 326458
Fax +39 0444 326458
www.hotelgiardini.com

THE CITY OF VICENZA AND ITS PROVINCE

The Vicenza district lies at the heart of that triangle of north-east Italy where the Alps, the Adriatic, the River Po and Lake Garda define ancient Venetia.

This authentic 'garden of the Veneto' is particularly favoured by the beauty and variety of its landscape, by the mildness of its climate and by the exceptional presence of numerous elements of great cultural and tourist interest.

Vicenza, an ancient Paleovenetian settlement, expanded along the Postumia when it became a Roman Municipium in 49 BC. The old city of Vicenza, enclosed within its medieval walls and crossed by the Bacchiglione and Retrone rivers, is dominated by the imposing mass of the Basilica Paladiana.

Along with the other historic buildings, it distinguishes one of the most elegant artistic piazzas in Italy: the Piazza dei Signori. It is precisely the buildings that face onto the piazzas and line the central streets, designed by Andrea Palladio (1508-1580), that make Vicenza a fascinating 'architect's city'; exceptional testimony of an age that saw the



magnificent inventions of the most celebrated of theatres, the Teatro Olimpico, and the 'Rotonda', which symbolises the Veneto villas around the world.

But the entire Vicenza district is dotted with hundreds of villas that, in splendid isolation beyond their curtains of stone and wrought iron, reveal luxuriant parks or extensive gardens decorated with magnificent statues. The harmonious facades and splendid walls frescoed by great masters of Veneto painting document the development of art and tastes over three centuries of history.

This is also true of the castles. Some of these have been converted into prestigious homes, such as those of Montegalda and Thiene; others recall history and legends that have created fantastic traditions, such as the castles of Marostica, which look down on the Chess game with live pieces in costume, or those of Romeo and Juliet in Montecchio Maggiore, which inspired the most famous love story in the world.

The province of Vicenza offers the chance to make numerous and interesting itineraries around its tourist areas: the Colli Berici, an oasis of calm and Mediterranean warmth, with the calm, greenish-blue Lake Fimon, an

inexhaustible attraction for the naturalists of yesterday and today; the 'monti castellari' with their sunny and welcoming promontories, theatre of bloody Medieval battles between the disputed castles that rise in every village, from Montebello to Montecchio and from Arzignano to Malo; the irrigated and fertile 'pieditèsina' with its villas between rice paddies and open pastures towards the Brenta; corners of rural peace worthy of the most classical Virgilian landscape; the open spaces of the Tonezza and Asiago plateaus, with their pretty hamlets, joyous in sunshine and mountain perfumes, but also mysterious like the Nordic traditions they maintain among their dense forests and steep crags; the spectacular scenery of the Astico and Valsugana-Brenta Canal valleys, with their delightful rivers, natural waterways towards Trento from Arsiero or Bassano del Grappa. The picturesque 'pedemonte' with its villas on the most charming hillocks dotted with cherries and olives; finally, Recoaro Terme and the Piccole Dolomiti, which complete this marvellous Vicenza landscape, with their iridescent architecture of rock looking out from between wings and backdrops of green and blue.

HOW TO GET THERE

By Plane:

There are two convenient passenger airports near Vicenza, where all major companies operate for both national and international scheduled flights: **Venezia Tessera (Venice Marco Polo Airport)** and **Verona Villafranca (Verona Valerio Catullo Airport)**. From these airports it is possible to get to Vicenza in 90 minutes by fast train after short coach links.

By train:

Vicenza is on the main Brescia-Padua (Milan-Venice) train route and is therefore well-served and easily reachable by train:

Milan • 2 hours

Venice-Mestre • 40/60 min.; Venice-Santa Lucia (centre) additional 10 min.

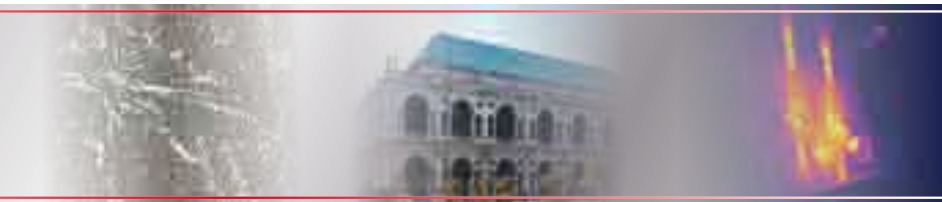
Verona • 30 min. (frequent connections to Rome in 4,30 hs)

Padua • 20 min. (frequent connections to Rome in 5,30 hs)

• Ferrovie dello Stato (National Railway Company) www.trenitalia.it

By car:

• Motorway A4 (Milan/Venice), exit Vicenza
• Motorway Society - www.autostrade.it / www.autobspd.it



5th HTOC 2012

registration Fees (BEFORE January 13, 2012)

	STANDARD RATES	AIM MEMBERS RATES
DELEGATES:	EUR 460 (*)	EUR 380 (*)
SPEAKERS(◆) / ACADEMICS / CHAIRMEN OF THE SESSION:	EUR 410 (*)	EUR 330 (*)
STUDENTS(◆◆):	EUR 250 (*)	FREE

(*) Revenue Stamp included

registration Fees (AFTER January 13, 2012)

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DELEGATES:	EUR 560 (*)	EUR 480 (*)
SPEAKERS(◆) / ACADEMICS / CHAIRMEN OF THE SESSION:	EUR 510 (*)	EUR 430 (*)
STUDENTS(◆◆):	EUR 350 (*)	FREE

(*) Revenue Stamp included

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Cumulative registrations for over 3 delegates from the same company will entitle to a discount of 15% of the total amount.

Please complete and return this form by January 20, 2012 to:
 ASSOCIAZIONE ITALIANA DI METALLURGIA - AIM Piazzale Rodolfo Morandi 2 - I - 20121 Milano, Italy
 e-mail: info.aim@aimnet.it · Tel. +39-02-76397770 · Fax +39-02-76020551 · Website: www.aimnet.it/htdc2012.htm

To register please fill-in the following registration form in all its parts. (It is also possible to register online - www.aimnet.it/htdc2012.htm)

Please use BLOCK letters throughout form (photocopies can be used)

PERSONAL AND INVOICING DATA

Family Name First Name(s)

Company Name

Company Fiscal Address

ZipCode Town Country

e-mail for invoicing and billing information

e-mail for correspondence

Tel. Fax

VAT and FISCAL CODE (if different) Order ref. number (if requested on the invoice)

I will attend the Conference as:

- Speaker (paper nr _____)
- Academic
- Chairman of the session
- Delegate
- Student
- AIM Junior Member
- n. _____ Accompanying Persons

- NON MEMBER**
- €
- €
- €
- €
- €
- free
- €

Total amount being paid:

€

We inform you that data collected will be treated following the normal institutional activity of AIM. In accordance to article 130 of the DLgs 196/03 in every moment the interested party has the right to oppose the treatment of one's personal data. Your data will be dealt with in accordance of the DLgs. in 30th June 2003 n. 196, guaranteeing the rights of the interested parties foreseen in the 7 art. of the Decree. We also inform you that AIM will communicate to foreign partners the personal data only for above reasons. We also inform you that your personal data will be on the list of the conference participants. In the case that you DO NOT want to appear on this list you may block the mail box. We also inform you that the holder of the personal data is AIM in Milan in Ple Morandi 2, while owner of the personal data is ing. Ottavio Lecis, available near the AIM offices.

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- by bank transfer, to the order of Associazione Italiana di Metallurgia - AIM at "Banca Popolare Commercio e Industria", Branch no.2 - Milano, account no. 000000022325 - cod. ABI 05048 - CAB 01602 - cin L - IBAN: IT92L0504801602000000022325, swift code POCIITM1002. The transfer order must specify the name of the delegate and the reference "HTDC 2012". **A copy of the transfer order must be sent to AIM, together with this Registration Form**
- by credit card online (www.aimnet.it/htdc2012.htm)

Date

Signature

registration form

February 9, 2012

- 9.30 **OPENING CEREMONY and OPENING LECTURE**
- 10.30 **OVERVIEW OF POSTER SESSION**
- 10.45 **EVALUATING THE POTENTIAL OF DIECASTING ALLOYS**
- 12.30 **WELCOME BUFFET**
- 14.00 **ADVANCED HPDC TOOLING AND EQUIPMENTS**
- 20.00 **CONFERENCE DINNER**

February 10, 2012

- 9.00 **OPENING LECTURE**
- 9.45 **FOUNDRY OF THE FUTURE**
- 12.20 **LUNCH**
- 13.45 **DIECASTING WITH ENGINEERED SURFACES**
- 15.30 **BEST POSTER AWARD and CLOSING OF THE CONFERENCE**

Time Table





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Piazzale R. Morandi 2 - 20121 Milano - Italy
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E-mail: info.aim@aimnet.it - www.aimnet.it