



IWSQ-2

2nd International Workshop

Bergamo - Italy - 1-2 December 2022

Surface quality
of continuously
cast products

Organised by



**ASSOCIAZIONE
ITALIANA DI
METALLURGIA**

ASMET[®]
THE AUSTRIAN SOCIETY FOR
METALLURGY AND MATERIALS

www.aimnet.it/iwsq-2.htm

Six years after the successful first conference on the topic, AIM, in cooperation with its sister society ASMET, organizes once again a two-day event focused on the Surface Quality of continuously cast products.

The surface quality of ingots, billets, blooms and slabs is a particularly important issue in order to insure the required surface quality of final rolled and forged products. This aspect is becoming increasingly significant especially nowadays, when a lot of steelmakers are refocusing their activity on the search for better surface quality or new specialty steels requiring high quality surface features. All this lays on a table of new challenges faced by steelmaking industries, when energy efficiency and consequently lower environmental impact are concerned.

This international Workshop aims at sharing the knowledge about the improvement of the surface quality of the continuously cast products and this scope will be achieved by clear expositions about:

- recent advances on the defect analysis;
- the root cause of the defects;
- innovative lubricating products;
- operations and maintenance;
- application of electromagnetic devices;
- AI applications, simulation and computing methods.

WORKSHOP CHAIRMEN

Dr. Riccardo Carli – Prosimet

Prof. Christian Bernhard – Montanuniversitaet Leoben

ORGANIZING COMMITTEE

Federica Bassani – Associazione Italiana di Metallurgia

Sabrina De Donato – Associazione Italiana di Metallurgia

Yvonne Dworak – Asmet

Gerhard Hackl – Asmet

Carlo Mapelli – Politecnico di Milano

Silvano Panza – AIM

Marta Verderi – AIM

THURSDAY 1 DECEMBER 2022

10:00 **Welcome coffee & Registration of attendees**

11:00 Welcome addresses

Dr. Riccardo Carli – Prosimet

Prof. Christian Bernhard – Montanuniversitaet Leoben

Chairperson: RICCARDO CARLI

11:30 **Structural effects of mold fluxes on both the liquid and solid
IWSQ_001 lubrications in continuous casting mold**

J. Cho - POSTECH, Korea

12:00 **Space for science: microgravity studies for steel castability assessment
IWSQ_002**

B. Santillana - TATA Steel Europe, Netherlands

12:30 Lunch

Chairperson: MARCO ALLONI

14:00 **On the potential of bending tests for simulating surface defect
IWSQ_012 formation in continuous casting**

C. Bernhard - Montanuniversitaet Leoben, Austria

R. Krobath - voestalpine wire rod GmbH, Austria

14:30 **Using digital twins for process optimization and reduction of defects in
IWSQ_006 continuous casting**

P.E. Ramirez Lopez - SWERIM AB, Lulea, Sweden and KTH, Royal Institute of Technology, Stockholm, Sweden

S. Kesavan, H. Yang, P. Jalali, A. Sundström - SWERIM AB, Lulea, Sweden

15:00 **Use of an automatic optical inspection system for the detection of
IWSQ_017 defects arising from continuous casting processes, based on Machine Learning algorithms, for the analysis of incidence of oscillation marks on AISI 316L and 316LI austenitic stainless-steel slabs**

F. Di Giovanni, D. Mombelli - Politecnico di Milano

A.F. Ciuffini - Acciai Speciali Terni

15:30 **Sapotech Reveal CAST – Deep Learning for surface quality analysis of
IWSQ_014 hot steel slabs**

S. Kaukonen, E. Kiviahde, H. Suopajärvi - Sapotech Oy, Finland

16:00 Coffee break

THURSDAY 1 DECEMBER 2022

Chairperson: CHRISTIAN BERNHARD

16:30 **IWSQ_008** **Conventional powder substitution to improve further quality&castability for now and future continuous casting challenges**

M. Cornille - ArcelorMittal, France
R. Carli, M. Alloni - Prosimet, Italy
G. Nitzl, A. Giacobbe - RHIMagnesita, Austria

17:00 **IWSQ_005** **Tundish covering powders. Review and latest developments**

M. Alloni, R. Carli, O. Wunderlich - Prosimet, Italy

17:30 **IWSQ_004** **Effect of carbon on the melting behavior of a mold powder under high heating rates**

N. Gruber - Montanuniversitaet Leoben, Austria

18:00 **IWSQ_018** **Proil™ a valuable implementation for open stream practice. How a mold flux dispersion may improve these process**

A. Giacobbe - RHI MAGNESITA, Brescia, Italy
C. Eglsaer - RHI MAGNESITA GmbH, Vienna, Austria
G. Krumpel - TCL RHI MAGNESITA, Leoben, Austria

19:30 Workshop Dinner at Roof Garden Restaurant

FRIDAY 2 DECEMBER 2022

Chairperson: CARLO MAPELLI

8:50 **IWSQ_010** **Investigation of the performance of a fluorine free mold powder at a pilot plant**

S. Riedler, N. Gruber, I. Marschall, S. Ilie, G. Klösch - Voestalpine Stahl Donawitz GmbH, Austria

9:20 **IWSQ_009** **Effect of nozzle parameters on the cooling conditions in the secondary cooling zone of a slab caster**

J. Laschinger - K1-MET GmbH, Austria
M. Taferner, M. Bernhard, C. Bernhard Chair of Ferrous Metallurgy - Montanuniversitaet Leoben, Austria
S. Ilie - voestalpine Stahl GmbH, Austria

9:50 **IWSQ_019** **Casting mold with optical fibers, a clearer window to the process.**

A. Olivos, S. Carless, H. Wouters, E. Dekker, Tata Steel IJmuiden, The Netherlands
M Schuster, O. Lang - Primetals Technologies, Austria

10:20 **IWSQ_020** **Laser and latest technologies for moulds and ccm dimensional control**

F. Fossi, A. Porri - SIDER SISTEM, Italy

10:50 Coffee break

FRIDAY 2 DECEMBER 2022

Chairperson: ANDREA GIACOBBE

- 11.20 **IWSQ_007** **Acting on the roots of the defect sources: key equipment and applications**
S. Miani, S. Cicutto, S. Spagnul, S. De Monte - Ergolines Lab, Italy
- 11.50 **IWSQ_016** **3D Slab Inspection – Results and Benefits from a user point of view**
F. Colombari - Atlas Copco Italia Srl; ISRA Parsytec GmbH, Germany
D. Recker, ISRA Parsytec GmbH, Germany
- 12.20 **IWSQ_013** **Automated 3D Surface Inspection System - Unveiling the Invisible**
T. Köpsel - IMS Messsysteme GmbH, Germany
- 12.50 **IWSQ_015** **The effects of speed casting on the depth of oscillation marks and disturbed surface during continuous casting ferritic stainless steel slabs**
A. Gorji, G. Khoshdelpour, K. Morady, M. Shafeidehnavi, M. Sanaeinejad – Mobarakeh Steel Company, Iran
- 13.20 **IWSQ_011** **Elimination of Ladle Nozzle Clogging in order to reduce slab longitudinal cracks in Continuous Casting**
M. Sh. Sharifiyan, A. Keshavarzi, J. Gharagouzlou - Hormozgan Steel Company (HOSCO), Iran
- 13.50 Closing remarks

GENERAL INFORMATION

VENUE

The Conference will be held in Bergamo at the Congress Center Giovanni XXIII, viale Papa Giovanni XXIII, 106 (www.congresscenter.bg.it).

LANGUAGE

The official language of the Workshop will be English.

REGISTRATION FEES

FEES FOR DIGITAL PARTICIPATION ARE THE SAME AS ON-SITE ATTENDANCE FEES.
ALL REGISTRATIONS ARE REVENUE STAMP INCLUDED

•SESSION CHAIRPERSON / •COMMITTEE MEMBER

AIM MEMBER € 350
NON MEMBER € 440

PARTICIPANT (NON-PRESENTER)

AIM MEMBER € 530
NON MEMBER € 620

For non-members, the fee includes AIM Membership for the last quarter of 2022 and for the year 2023

STUDENT *

€ 370 (22% VAT included)

* Student will have to provide valid proof of student status.

Additional ticket for Workshop dinner for accompanying persons: € 90 (plus 22% VAT)
(Includes only the Workshop dinner on December 1, 2022)

WORKSHOP REGISTRATION FEES INCLUDE:

- Admittance to the workshop
- Workshop bag with electronic proceedings
- Workshop dinner on December 1
- Coffee breaks and lunch

PAYMENT AND REMITTANCE

- by bank transfer, to the order of Associazione Italiana di Metallurgia - AIM at "CREDITO EMILIANO SpA", Branch no. 052 Milano Sede - Via Andegari, 14 - 20121 Milano - Italy, account no. 010000480455 cod. ABI 03032 - CAB 01600 - cin M
IBAN: IT33M0303201600010000480455, swift code BACRIT22MI
The transfer order must specify the name of the participant and the reference "IWSQ-2". A copy of the transfer order must be sent to AIM, together with the Registration Form.
- by credit card online (www.aimnet.it/iwsq-2.htm).

SPEAKERS CANCELLATION AND REFUND POLICY

A refund, less 20% deduction for administrative costs, will be issued for written cancellations received **by November 11, 2022**. For speakers who notify their cancellation **after November 11, 2022** or will not attend the Workshop, **a charge of 100% of the conference fee will be withheld**. Their papers will be published anyway in the proceedings and a copy of the proceedings will be sent after the event.

CANCELLATION AND REFUND POLICY

A refund, less 20% deduction for administrative costs, will be issued for written cancellations received by **November 14, 2022**. For attendees who notify their cancellation after **November 14, 2022** or will not attend the conference, **a charge of 100% of the conference fee will be withheld** and a copy of the proceedings will be sent after the event.

ATTENDEES WITH TRAVEL RESTRICTIONS

For speakers and attendees with travel restrictions, it will be possible to present and follow the presentations digitally.

INSURANCE

The Organising Secretariat cannot 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 Workshop. Participants should therefore take whatever steps they consider necessary as regards insurance.

WORKSHOP DINNER

The Workshop dinner will be held on the evening of December 1 at 19:30 at ROOF GARDEN RESTAURANT - HOTEL SAN MARCO - Piazzale della Repubblica 6, Bergamo, in order to give delegates the opportunity to meet informally.

BERGAMO

Bergamo greets visitors with its Venetian Walls. Surrounded by rivers and lush, verdant valleys, crossed by paths that widen to Parco dei Colli, the area's largest park, the city looks like a lounge filled with art, culture and nature, with a fascinating and complex history just waiting to be shared with others. The "upper and lower" city reveals a mixture of pleasant surprises and unexpected encounters, such as those with Gaetano Donizetti, the great composer of international renown, Bartolomeo Colleoni, the Bergamo leader who served under the Republic of Venice and Lorenzo Lotto, among the most famous Italian Renaissance artists who lived and worked in Bergamo for over a decade.

ACCOMMODATION [>>link](#)

IWSQ-2

Bergamo - Italy

1-2 December 2022

www.aimnet.it/iwsq-2.htm

Please complete and return this form
by **November 14, 2022** to
ASSOCIAZIONE ITALIANA DI METALLURGIA
met@aimnet.it

**Fees for digital participation are the same as
on-site attendance fees**

ALL REGISTRATIONS ARE REVENUE STAMP INCLUDED	AIM MEMBER	NON MEMBER	ALL REGISTRATION FEES INCLUDE:
<ul style="list-style-type: none">SPEAKERSESSION CHAIRPERSONCOMMITTEE MEMBER	€ 350	€ 440	<ul style="list-style-type: none">Admittance to the eventWorkshop bag with electronic proceedingsdinner on December 1
PARTICIPANT (NON-PRESENTER)	€ 490 AFTER 14 NOVEMBER € 530	€ 580 AFTER 14 NOVEMBER € 620	<ul style="list-style-type: none">Coffee breaks and lunch
STUDENT *	€ 330 (22% VAT included) AFTER 14 NOVEMBER € 370 (22% VAT included)		* Student will have to provide valid proof of student status.

FOR NON-MEMBERS, THE FEE INCLUDES AIM MEMBERSHIP FOR THE LAST QUARTER OF 2022 AND FOR THE YEAR 2023

Additional ticket for Workshop dinner for accompanying persons: € 90 (plus 22% VAT)
(Includes only the Workshop dinner on December 1, 2022)

TO REGISTER PLEASE FILL-IN THE FOLLOWING REGISTRATION FORM IN ALL ITS PARTS. (IT IS ALSO POSSIBLE TO REGISTER ONLINE - www.aimnet.it/iwsq-2.htm)

PERSONAL DATA

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

FAMILY NAME _____
FIRST NAME(S) _____
E-MAIL FOR CORRESPONDENCE _____
TEL. _____

INVOICING DATA

COMPANY NAME _____
COMPANY FISCAL ADDRESS _____
ZIP CODE _____ TOWN _____ COUNTRY _____
E-MAIL FOR INVOICING AND BILLING INFORMATION _____
VAT NUMBER _____ ORDER REF. NUMBER (IF REQUESTED ON THE INVOICE) _____

ONLY FOR ITALIAN SOCIETIES

Indirizzo posta elettronica certificate (PEC) _____
Codice destinatario _____

I WILL ATTEND: ON-SITE DIGITALLY

AS: DELEGATE (NON-PRESENTER) - SESSION CHAIRPERSON - EXHIBITOR/SPONSOR - COMMITTEE MEMBER - STUDENT* * A valid proof of student status is required.
 SPEAKER (PRESENTER) PAPER NR. _____ AND _____ (EACH REGISTRATION COVERS A MAXIMUM OF TWO PAPERS)

AIM MEMBER NON MEMBER €. _____
N° _____ ADDITIONAL TICKET(S) FOR SOCIAL EVENT (DECEMBER 1) FOR ACCOMPANYING PERSON €. _____

TOTAL AMOUNT BEING PAID: €. _____

PAYMENT AND REMITTANCE

by bank transfer, to the order of Associazione Italiana di Metallurgia - AIM at "CREDITO EMILIANO SpA", Branch no. 052 Milano Sede - Via Andegari, 14 - 20121 Milano - Italy, account no. 010000480455 - cod. ABI 03032 - CAB 01600 - cin M IBAN: IT33M0303201600010000480455, swift code BACRIT2MIL. The transfer order must specify the name of the participant and the reference "IWSQ-2". A copy of the transfer order must be sent to AIM, together with the Registration Form.
 by credit card online (<http://www.aimnet.it/iwsq-2.htm>)
 against invoice

PRIVACY

I, the undersigned, have read the Privacy notice at the following page and I accept that AIM processes my personal data in accordance with articles 13-14 of EU Regulation no. 679/2016 (GDPR). Furthermore, I authorize AIM:

- to send any invitations to events of interest from other worldwide metallurgical associations: yes no
- to insert my name in the list of event participants: yes no

DATE _____

SIGNATURE _____

Pursuant to artt. 13-14 EU REG. n. 679/2016 (GDPR)

AIM, Italian Association of Metallurgy (VAT number 00825780158), in person of the legal representative Mr Silvano Panza (hereinafter the "Data Controller"), current in Milan, via Turati n. 8, informs you that, pursuant to art. 13 of the EU Regulation n. 2016/679 (hereinafter "GDPR"), your data will be processed in the manner and for the following purposes.

1. Personal Data.

The Data Controller processes personal identifying data (i.e.: name, surname, company name, address, telephone number, e-mail address, username, bank and payment details, hereinafter referred to as "Personal Data") that you have communicated on the occasion of the paper registration or through the website www.metallurgia-italiana.net.

2. Purpose of the treatment.

Your data will be processed by the Data Controller for the following possible purposes:

- transmission of periodic communications by e-mail;
- invitation to activities and/or events promoted by the Data Controller;
- in case of registration on the website www.metallurgia-italiana.net, registration on the site and creation of a user (username and password);
- in case of registration for events, inclusion in the list of participants at the event, receipt of invitations for relevant events from other worldwide metallurgical associations and invoicing of the fee for the participation at the event, if due;
- in case of association with AIM, sending of the membership card;
- in case of purchase of books or other material, delivery of the same and invoicing.

3. Processing methods.

The processing of your personal data is carried out by means of the operations indicated in art. 4 n. 2) GDPR and more precisely: collection, registration, organization, storage, consultation, processing, modification, selection, extraction, comparison, use, interconnection, blocking, communication, cancellation and destruction of data. Your personal data are subjected to both paper and electronic processing. The Data Controller will process personal data for the time necessary to fulfill the aforementioned purposes and in any case for no more than 10 years from the termination of the relationship.

4. Access to the Data.

Your data may be made accessible, for the purposes referred to in art. 2, to the employees and collaborators of the Data Controller, in their capacity as persons in charge and/or internal managers of the processing and/or system administrators.

5. Data communication and data transfer abroad.

The Data Controller may communicate your name, nationality and e-mail address to foreign associations, exclusively in the case of participation in itinerant congress editions.

The aforementioned associations, operating in countries located in or outside the EU, may not provide adequate data protection safeguards (a complete list of countries providing adequate data protection safeguards is available on the EU Guarantor's website for the Protection of Personal Data). In such cases, the transfer of your data will be carried out in compliance with the applicable international rules and agreements, as well as with the adoption of appropriate measures (e.g. standard contractual clauses).

Personal data are stored on servers located in Milan (IT), within the European Union. In any case, it is understood that the Data Controller, if necessary, will have the right to move the servers even outside the EU. In this case, the Data Controller hereby ensures that the transfer of non-EU data will take place in accordance with the applicable legal provisions, subject to the stipulation of the standard contractual clauses provided by the European Commission.

6. Rights of the Data Subject.

In your capacity as a Data Subject, you have the rights set forth in art. 15 GDPR and, precisely, the rights of:

- to obtain confirmation of the existence or not of personal data concerning you, even if not yet registered, and their communication in an intelligible form;
 - to obtain the indication: a) of the origin of personal data; b) of the purposes and methods of the processing; c) of the logic applied in case of treatment carried out with the aid of electronic instruments; d) of the identification details of the Data Controller, the data processors and the designated representative pursuant to art. art. 3, paragraph 1, GDPR; e) the subjects or categories of subjects to whom the personal data may be communicated or who may become aware of it in their capacity as designated representative in the territory of the State, managers or agents;
 - to obtain: a) updating, rectification or, when interested, integration of data; b) the cancellation, transformation into anonymous form or blocking of data processed unlawfully, including data whose retention is unnecessary for the purposes for which the data were collected or subsequently processed; c) the attestation that the operations referred to in letters a) and b) have been brought to the attention, also as regards their content, of those to whom the data have been communicated or disseminated, except in the case where such fulfillment is it proves impossible or involves a use of means manifestly disproportionate to the protected right;
 - to object, in whole or in part, for legitimate reasons to the processing of personal data concerning you, even if pertinent to the purpose of the collection.
- Where applicable, it also has the rights referred to in articles 16-21 GDPR (right of rectification, right to be forgotten, right of limitation of treatment, right to data portability, right of opposition), as well as the right of complaint to the Guarantor Authority.

7. How to exercise rights.

You can exercise your rights at any time by sending: a registered letter to AIM, Italian Association for Metallurgy, via Turati n. 8, Milan or an e-mail to info@aimnet.it.

8. Data Controller and person in charge.

The Data Controller is AIM, Italian Association of Metallurgy, via Turati n. 8, Milan. The person in charge of data processing is Dr. Federica Bassani, via Turati n. 8, Milan - e-mail info@aimnet.it.

The updated list of data processors is kept at the Data Controller's headquarters.



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Organising Secretariat



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Via Filippo Turati 8
20121 Milano - Italy
phone: +39 0276397770
e-mail: met@aimnet.it

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