



Lowering Costs by Improving Efficiencies in Biomass Fuelled Boilers: New Materials and Coatings to Reduce Corrosion

Edition: October 2023

Dear Readers,

Every 4 months a newsletter is shared with all stakeholders and the scientific community that are involved and or interested in the field of bioenergy, including plant developers, plant operators, and technology suppliers, as well as governmental bodies. Furthermore, members of the public who are interested in one or more of the topics related to BELENUS, such as bioenergy and materials engineering, will also gain from these newsletters.

They cover the overall project progress, special topics, news, relevant impacts, information and where to meet us in person at important events.

We invite you to visit our website and get in touch, through the information available at the end of this document. Enjoy reading!

*Francisco Javier Pérez Trujillo
Coordinator of BELENUS
Universidad Complutense de Madrid*

*Mickaël Lambrecht & Gustavo García Martín
Editors of BELENUS newsletters
Universidad Complutense de Madrid*



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Introduction

The erosion tests have been carried out in two rounds, the results of first one are shown in Deliverable 3.6 "Intermediate results of the erosion tests" from 2022. The tests were performed on different coatings developed by the three coating developers: INTA, Kanthal and TEandM. A total of 14 coatings and 2 bulk materials were tested: 7 coatings from INTA, 3 coatings and 2 bulk materials from Kanthal and 4 coatings from TEandM. The coatings were deposited on SVM12. The coated samples have already been tested in the first round. For the second round, slurry coatings were excluded because they did not perform well in the first one. Additionally, two samples of uncoated SVM12 were also tested as reference.

Most of the coatings selected for the final test perform similarly in the erosion test up to 20 minutes of exposure and do not significantly improve the erosion resistance of uncoated SVM12. However it must be taken into consideration that the behavior of the oxidized SVM 12 is much worse as demonstrated in Deliverable 3.6. In most cases, no significant changes in the surface of the coatings have been observed. The hybrid coatings that contain a top slurry aluminized layer have the same behavior than HVOF coatings because this slurry layer has removed on the first round test. According to the gravimetric results, the best performing coatings were the FeCr based coatings (thFeCr and tlFeCr) and the bulk APMT.

Erosion test results

As seen on Figure 1, most of the coatings have similar behavior, with slight differences in weight loss up to 20 minutes of exposure, in most cases with higher mass loss than the substrate (SVM12). The coatings based on FeCr have the lowest weight loss, being the best performing coatings. The coating with the highest mass loss is the thCoMoCr as in the first run. In the intermediate results, it was indicated that in the hybrid coatings (ihHHS+sAl and ihNiCr+sAl) the slurry layer was removed and in this test the behavior was the same (ihHHS+Al and ihNiCr+Al). The ihNiCrAl coating performed worse than in first run in which it exhibited better behavior.

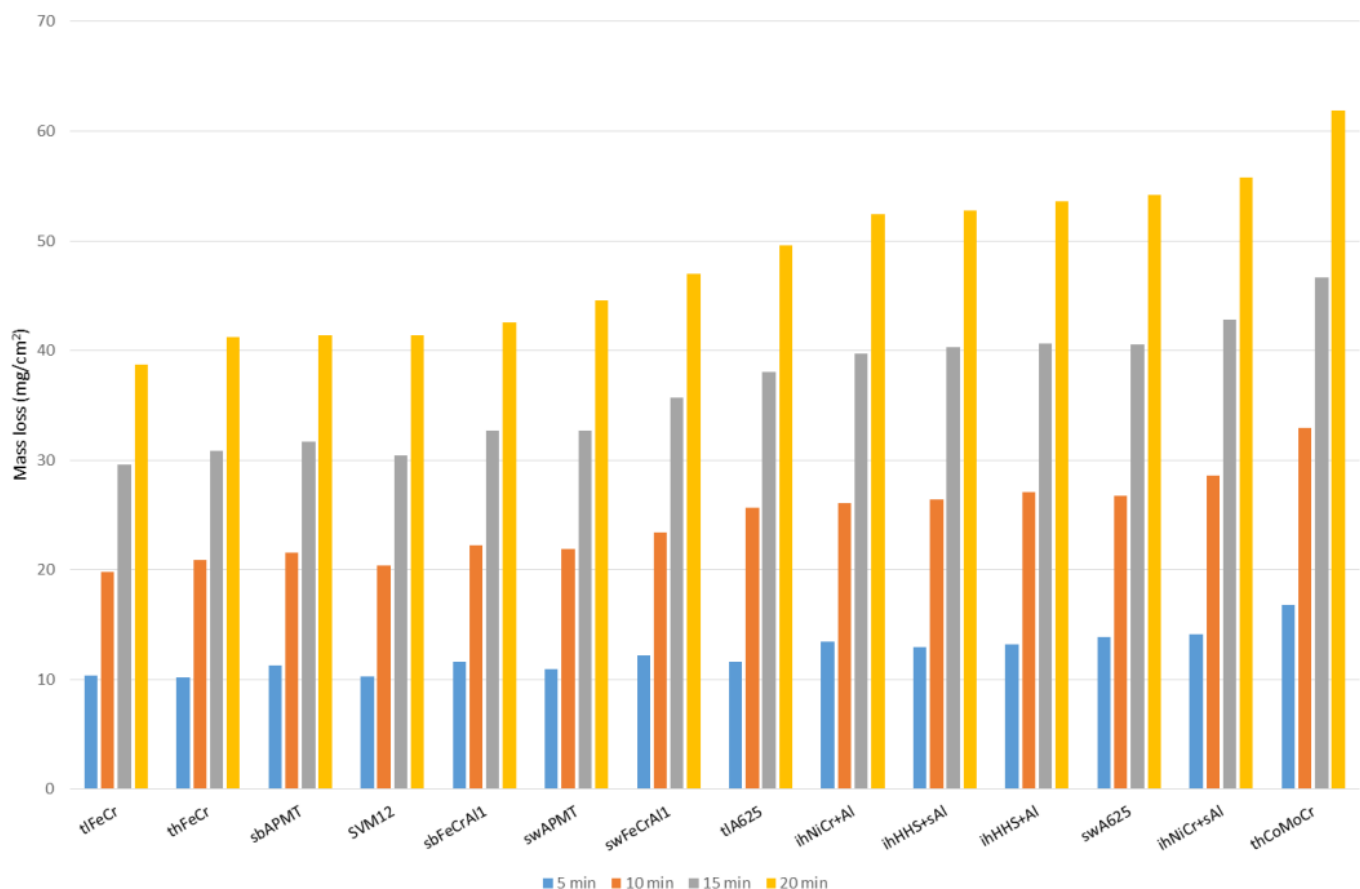


Figure 1 – Specimen mass change after erosion test



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Sectorial Breaking News

Date	Headline	Source
6 th June 2023	US researcher working on world's first biomass pipeline	Bioenergy-news
13 th March 2023	Škoda Auto subsidiary plant to utilise 100% biomass	Bioenergy-news
4 th August 2023	Japanese and Vietnamese companies initiate biomass pellet production trial	Bioenergy-news
11 th September 2023	VARO Energy to build USD 600m SAF plant in Rotterdam	Renewables now
15 th September 2023	Maersk launches new green methanol company	Renewables now
26 th September 2023	Galp to invest in advanced biofuels, hydrogen at Sines refinery	Renewables now
2 nd October 2023	Fortum inaugurates €70m biomass plant in Jelgava, Latvia	Bioenergy-news

Remarkable Upcoming Events.

WS30: BIOENERGY IN A NET ZERO FUTURE

- 19 October 2023
- Lyon, France

Reaching net-zero emissions globally by 2050 requires an unprecedented transformation in how energy is produced, transported and used. In the IEA Net Zero by 2050 scenario, modern bioenergy use rises to 100 EJ in 2050, meeting almost 20% of total energy supply. In an energy mix dominated by wind and solar, sustainable bioenergy features prominently in flexible energy generation, industry and transport, and is increasingly used in connection with carbon capture and utilisation or sequestration (CCUS). The captured biogenic CO₂ can either be stored to achieve a net extraction of CO₂ from the atmosphere (reaching so-called 'negative emissions') or it can be combined with green hydrogen to produce carbon-containing e-fuels and e-products.



IEA Bioenergy
Technology Collaboration Programme

5th European Conference Future of Biofuels 2023

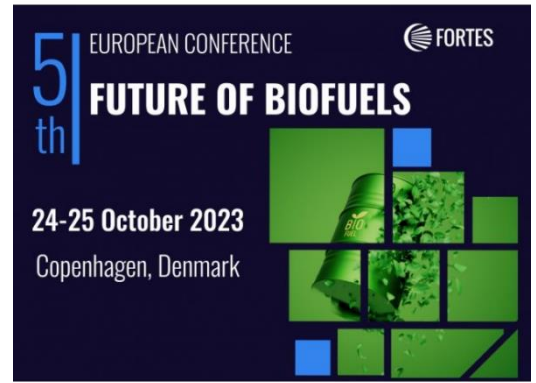
- 24-25th October 2023



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- Copenhagen, Denmark

Along with the European Commission's REPowerEU plan, released in May 2022 in response to energy market disruptions from Russia's invasion on Ukraine, EU aims to rapidly reduce dependence on Russian fossil fuels by 2027. Also with EU's maritime fuel law to curtail shipping emissions and its sister regulation in the aviation sector, the EU sets the level of acceptable emissions and curtails them over time. Aiming to be serious drivers for biofuel market development.



EXPERT WORKSHOP: EXPLORING FLEXIBILITY FROM RENEWABLE HYDROGEN AND BIOENERGY IN ENERGY SYSTEMS MODELLING

- 17th November 2023
- Torino, Italy



The objective of this IEA Bioenergy, IEA ETSAP and IEA Hydrogen collaboration is to exchange



modelling experiences and perspectives on the multi-faceted aspects of flexibility. A bioenergy supply chain can be an intricate and networked affair: Flexibility can often be found throughout the chain, in feedstock sourcing, pre-treatment, storage, distribution, and conversion into heat, power, and fuels. While hydrogen supply and utilisation from feedstock-independent renewables might be a less complex endeavour, respective impact assessment is not straightforward either. For example, energy storage at different time scales, inter-sectoral synergies and tradeoffs, and contributions to energy security must be accounted for. Also, system complexification through integration, sector-, and multi-sector coupling boosts systemic risks, encompassing safety concerns, security vulnerabilities, and the potential for cascading failures.

Stay in contact with us. Visit our website.

BELENUS website www.BELENUS-project.eu is available since the early beginning of the project. It shows the scope and objectives of the project along with outstanding results. You can find out more interesting information about the project and the impact of the results achieved, including all dissemination activities carried out.

If you have any question, feel free to drop us a line at contact@BELENUS-project.eu or on social medias *LinkedIn*  and *Twitter* 



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