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We produce and distribute globally a new type of sensor developed by us that measures hydrogen more accurately, quickly, and reliably—thanks to this, the production and usage of H₂ are now significantly safer and more cost-effective! The devices, based on advanced thermal conductivity measurements on microchips, outperform any existing solution in meeting the requirements of the H₂ industry. Our technology can thus significantly advance the energy transition towards hydrogen.

Ho, Ho, Ho H₂!

Archigas says thank you & wishes everyone a Merry Christmas!

Once again, a warm hello to all hydrogeners just before Christmas and New Year. We and the whole Archigas team would like to thank you very much for the overwhelming interest in our new sensor technology that we were able to present this year. The response from all over the world was more than impressive. With so much encouragement from industry and science, countless articles in the media, a podium place at the "Hessen Champions" innovation award and, of course, the many product inquiries from companies around the world, our team's hearts were warmed time and time again - a truly gratifying confirmation of years of often arduous development work. A big thank you to all of you from the bottom of our hearts!

But perhaps even more than the pleasant recognition of our innovative measurement technology and the enthusiastic testimonials from users, we were delighted to meet so many interesting and likeable people who share the same pioneering spirit for the development of hydrogen. That's why the past few months have always felt a bit like Christmas for us ...

Now it's our turn to wish you and your families a wonderful festive season. Enjoy the coming days and start the

new year healthy and rested! We are already looking forward to meeting you in 2024 - and of course we are also there "between the years" for all those who spontaneously feel like and have time for a professional and personal exchange. If you can't do without hydrogen, you may also want to skim through the other articles in our newsletter. We wish you an enjoyable read.

With this in mind, best regards!

Your Illya and Wladimir



Screw-in unit:

World first: Hydrogen analyzer now also available as a screw-in unit

One interested party from the electrolysis sector has already described it as "a gift" for H₂ measurement: our hydrogen analyzer as a screw-in unit - another real world first - confirms once again that it is often the particularly small and practical things that inspire. Thanks to our micro-sensor solutions, we now also offer our extremely compact analyzers in the form of a screw-in unit that can

be easily implemented in the design environment.

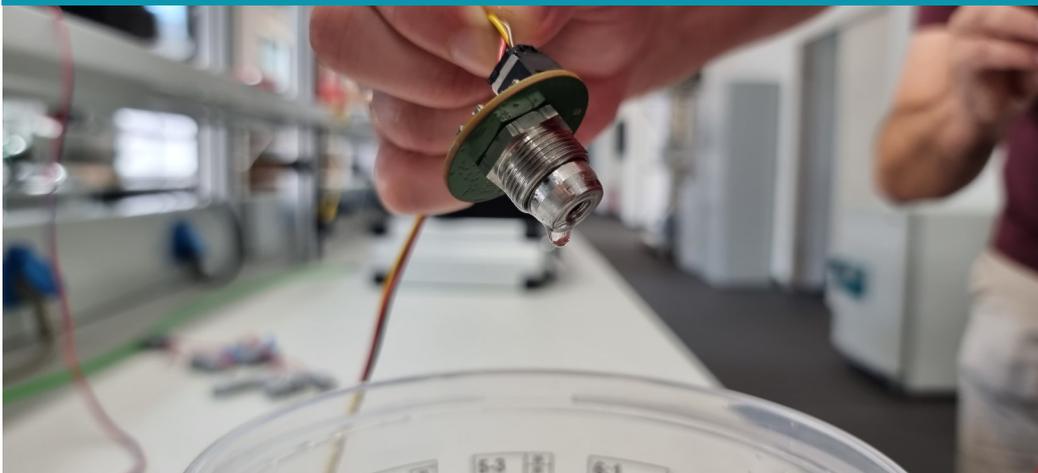
Of course, it still has the highly regarded characteristics of the new sensor technology from Archigas: Particu-

larly high measurement precision and stability with a response speed of less than 30 ms, plus high moisture resistance (see also the following article), robustness and ease of use. This sum of outstanding features, repeatedly described by scientists and industrial users as "remarkable", "amazing" or even "revolutionary", is made possible by an innovative technical implementation of the thermal conductivity measurement principle (TCD sensors) in combination with MEMS technology (semiconductors based on silicon wafers).

For integration into systems, for example for the production of H₂ by electrolysis, all Archigas sensor units are not only compact in design, but are also fully equipped with metal-to-metal connections. This ensures high tightness and pressure resistance above 200 bar; process gas temperatures of up to 100°C are also possible. With their stainless steel housings and IP67 protection class, the devices can also be used in harsh environments without any problems, and the gas-carrying parts and the sensor itself are corrosion-resistant. The gas path is made of high-quality 1.4404 stainless steel and the sensor is completely glazed on the gas side. In addition, continuous online quality monitoring up to H₂ 4.0 can be carried out and no additional equipment is required for quality measurement. The curves of additional gas pairs can be saved using internal memory and the devices can be easily adapted to changing measurement requirements.

With the screw-in unit, Archigas is now offering its hydrogen analysis in a new design. The sensor technology presented in 2023 is of course still available in various configurations for individual integration into plant construction.





No more sweating:

H₂ measurement even in very wet conditions

It is a dry realization: only reliable gas analysis makes the production, storage and use of hydrogen as an energy source truly safe. This means that you literally must not get into the water, for example if the H₂ sensor comes into contact with condensation. After all, even slight traces of moisture jeopardize the functionality of conventional systems - the measurement stops abruptly and it is not uncommon for the sensor itself to suffer irreparable damage. In short: moisture is a real "killer" of many gas analyzers. Accordingly, there is great interest among experts in a finding from the Archigas laboratory: tests confirm that our sensor solution continues to reliably measure and transmit data even in damp environments! The patented system of combined TCD and MEMS technology therefore has another clear advantage.

After all, water can occur at various points in the H₂ process chain. For exa-

mple, there is already a lot of moisture in the system during the electrolysis process for production. Clogged filters in systems and fuel cell exhaust gases (water vapor), which generate condensate, also come to mind. Whatever the source: if liquid water comes into contact with sensors for gas analysis, this usually seals their abrupt end. This is not only associated with safety gaps, but often also high costs - for example due to operational failure, repairs or the purchase of new modules with removal and installation.

The innovative sensor technology from Archigas can now counteract this, as the tests show. This is made possible by the special design of the small measuring module, which effectively prevents condensate from coming into contact with the actual sensor technology. We subjected the sensor to an ultimate endurance test in the renowned hydrogen laboratory of the RheinMain University of Applied Sciences (HSRM), with which we cooperate closely, and immersed it completely in a laboratory container filled with water.

Even under these conditions, it continued to transmit data. We only noticed minor deviations, which were so minimal that they had no relevant impact on practical use.

Of course, the sensor has not been developed for permanent use completely under water. This does not correspond to its intended use for H₂ gas analysis in an industrial environment. Nevertheless, its high resistance to moisture has enormous practical benefits. This is because interested parties who contact us repeatedly report their previous problems with moisture during hydrogen analysis. We subsequently saw the most adventurous constructions in pictures and on site, such as complicated heating and cooling systems to keep their previous measuring systems dry, often extremely difficult, space-consuming and cost-intensive. Those responsible were annoyed by the conventional, consistent dewatering and complex sample preparation. We are therefore all the more pleased to be able to provide a further argument for our measurement technology with its high resistance to moisture.



Test measurement over a period of 4 weeks.



Hessen Champions

Archigas on the podium of the "Hessen Champions 2023"

Partytime: On October 31, we were on the podium of the "Hessen Champions 2023"! More than 60 companies competed for the prestigious award in three categories.

The prizes were presented to the winner and the two co-finalists in the "Innovation" category, including Archigas, in the state capital of Wiesbaden by Hesse's Minister of Economics Tarek Al-Wazir at a ceremony attended by Hesse's Minister President Boris Rhein and other leading figures from politics and business. We were thrilled and delighted with this further form of recognition for years of research and development work.

We made it into the top three thanks to our new semiconductor-based sen-

sor technology for particularly fast, precise, reliable and cost-effective hydrogen measurement. Since spring 2023, we have been offering gas measuring devices based on this technology in various versions, including for H₂ generation through electrolysis, for incoming quality control and gas purity testing as well as for controlling and monitoring gas mixtures. The award as a finalist in the "Hessen Champions 2023" once again underlined the potential of our solutions. But we want to remain modest ...

News compact

+ + + Oh well, another reason to celebrate: **Archigas emerged as the winner in the reader poll for "Product of the Month November 2023" by the well-known industry magazine "Prozesstechnik"**. With 40 percent of the votes cast, our hydrogen analyzers clearly took first place. We think that's really good. Many thanks to everyone who voted for us. + + +



+ + + H₂ is hip: **at the end of November, we gave a presentation to interested students at the invitation of Rhein-Main University of Applied Sciences (HSRM)**. We presented our experiences as young entrepreneurs in the chilled-out atmosphere of the "Rollwerk" in Rüsselsheim. We hope that we were perhaps able to pass on some inspiration and a few helpful observations to the hydrogen "next gen". Gladly again anytime! + + +

Editors

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