

Press release

DENTAL INNOVATION: ACTIVAL AND CSEM LAUNCH 3D ANTIBACTERIAL ALIGNERS

- Actival has created innovative transparent 3D-printed aligners equipped with microchannels that release an antibacterial fluid, ensuring precise teeth alignment while preventing bad breath, plaque, and cavities.
- The newest startup from CSEM, Actival developed this technology through CSEM's startup program, ACCELERATE, which was crucial in bringing this innovation to maturity.
- Actival plans to launch in Switzerland and internationally, aiming to capture a growing global market.

Neuchâtel, September 19, 2024 – Actival is rethinking dental alignment with its innovative "Active Aligners". Unlike traditional aligners, which often cause oral hygiene issues like bacteria buildup, bad breath (halitosis), or cavities, Actival incorporates patented 3D-printed microchannel technology from CSEM. These channels allow saliva to circulate better around the teeth, promoting optimal hygiene. They also release an antibacterial and fluoride fluid, protecting enamel and keeping breath fresh. Actival, a young startup from the Swiss technology innovation center CSEM, plans to launch its "Active Aligners" in Switzerland and the United States (US), followed by an expansion into Europe and internationally.

Innovative Aligner Technology: Better Oral Health through Microchannels

In recent years, dental aligners have gained popularity due to their comfort and discretion. However, their traditional design can pose risks to oral health, such as bacterial buildup, bad breath (halitosis) and cavities. Actival has solved this issue by integrating microchannels directly into its aligners, using patented 3D-printed technology.

"The microchannels ensure continuous circulation of saliva, unlike conventional aligners. This circulation is essential to prevent the side effects of traditional aligners, such as dental plaque and cavities," explains Nikola Kalentics, an engineer at CSEM and CEO and founder of Actival.

Actival: An idea brought to life by CSEM's ACCELERATE program

The "Active Aligners" project by Actival came to life thanks to the support of CSEM's ACCELERATE program, specifically from its Innogrant module. This module, dedicated to internal collaboration, aims to transform innovative ideas into viable technological projects. With this support, Actival benefits from the expertise of a group of CSEM engineers who work on development projects alongside Kalentics to perfect every aspect of the technology, from microchannel design to mass production.

Cyrill Cattin, Group Leader at CSEM, explains: *"One of the main technical challenges was ensuring the channels remained open during 3D printing. Thanks to CSEM's unique expertise, we overcame this obstacle, creating innovative and effective aligners".*

The micro-channels, created during 3D printing, act as reservoirs for antibacterial fluid that is released over a week. At the end of this period, the aligner must be replaced, as in traditional orthodontic treatment. For an average dental correction, the treatment lasts around six months and requires around twenty resin aligners. The fluid, as well as the aligner itself, is transparent. *"In ten days, an aligner can correct the orientation of the teeth by 0.2 millimeters,"* says Kalentics.

Bahaa Roustom, VP of Marketing and Business Development at CSEM, highlights the importance of the ACCELERATE program: *"Without the technical, financial, and managerial support from CSEM via the Innogrant module, this idea would not have reached technological maturity or been marketable. The ACCELERATE program eliminates many entrepreneurial risks, offering privileged access to CSEM's*

skills, network, and resources. With quality managerial coaching, entrepreneurs can focus on their development while acquiring essential skills. This program gives them the confidence needed to succeed in their entrepreneurial journey."

Finalist of the renowned BCN Innovation Award

Thanks to CSEM's support, Actival is currently a finalist for the prestigious BCN Innovation Prize, which could provide an additional 150,000 Swiss francs in funding, accelerating the commercialization of its innovative aligners. "CSEM's ecosystem is the ideal place to launch a startup. The crucial early stages, such as technological development and crowdfunding, are made much easier. Thanks to this program, Actival is well-positioned to become a key player in modern orthodontics," notes Roustom.

A growing market: The future of orthodontic care is bright

The global market for transparent dental aligners, estimated at 6.3 billion US dollars in 2022, is growing rapidly at 30.7%. This represents a potential of 46 billion US dollars by 2030. Actival plans to enter this market with its "Active Aligners," which are better suited to patients' oral health. Kalentics states: "Our technology offers considerable added value compared to existing aligners, combining comfort, aesthetics, and oral health protection. We will not opt for a B2C (business to customer) approach, but exclusively B2B (business to business). Dental clinics will prefer our product as it is more comprehensive and therefore more effective." With its technology protected by international patents, Actival is perfectly positioned to conquer an increasingly competitive orthodontic market. Clinical trials are already underway, and the first in vitro results are promising. "We are now awaiting the necessary authorizations to launch patient trials. Production of the 'Active Aligners' will take place in Switzerland, with a commercial launch planned for late 2025 in Switzerland and the United States, followed by Europe in 2026, and Asia in 2027," adds the young CEO, Kalentics. In the meantime, Actival is working closely with dental experts in Switzerland and abroad to promote its innovation. With vast expansion prospects, the startup plans to leverage feedback from the early users to further refine its technology.



Two prototypes of "Active Aligners" equipped with antibacterial diffusers. The one on the left represents the transparent aligner prototype in its final appearance. The prototype on the right contains a blue liquid highlighting the innovation: a 3D-printed microchannel system.

Further information

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About CSEM—Facing the challenges of our time

CSEM is a Swiss technology innovation center developing advanced technologies with a high societal impact, which it then transfers to industry to strengthen the economy. The non-profit oriented, public-private organization is internationally recognized, and works to support the disruptive activities of companies in Switzerland and abroad. CSEM operates in the domains of precision manufacturing, digitalization, and sustainable energy. To accomplish its mission as a gateway between research and the economy, CSEM's more than 550 employees from 46 countries collaborate with leading universities, scientific institutions, research institutes, and industrial partners. With its six sites in Allschwil, Alpnach, Bern, Landquart, Neuchâtel and Zurich, CSEM is active all over Switzerland.

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