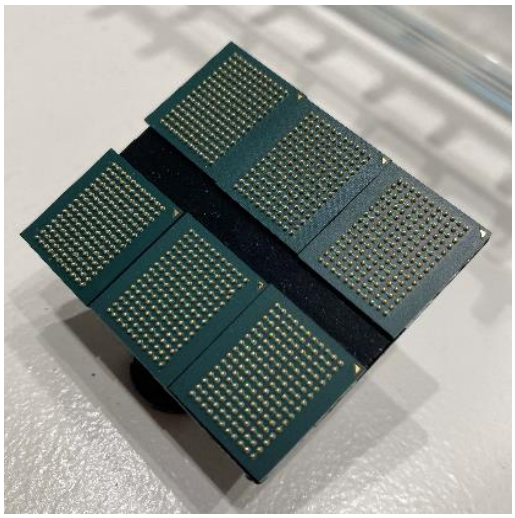
PRESS RELEASE
Andrézieux, 16 October 2023

Superball: HEF innovation puts the Loire in the spotlight on the industry's international stage

HEF is pleased to introduce hollow-core balls, a unique technology that improves the quality of solder balls used for soldering in all electronic components. This opens up a significant market opportunity for the HEF Group, the only company in Europe and, therefore in France, with this expertise. Called "Superball", this €800,000 research and development innovation was a joint project by IREIS (HEF's R&D centre), Thalès, Nicomatic, and the Georges Friedel laboratory at the Saint-Etienne Ecole des Mines. It won the Auvergne-Rhône-Alpes Region's call for R&D BOOSTER projects and led to the recruitment of four people dedicated to the project.



The global solder ball market is growing fast: it has an estimated potential of $350 million by 2024 and forecasts indicate that it could reach $484.61 million by 2029.

Traditionally, solder balls used for soldering printed circuit boards (PCBs) in electronic devices have been solid metal (lead in the past and tin today). **HEF's innovation involves creating high-performance hollow-core balls that better absorb thermal variations in PCBs.**

By doubling the soldering lifespan, this innovation helps to improve the quality of everyday devices, including computers and mobile phones, as well as position sensors and accelerometers. In the mobility, aeronautics, space and defence sectors, these beads provide the performance and reliability required for electronic assemblies operating in severe conditions. Not only are they more efficient than their all-metal counterparts, they also meet the requirements of European directives (excluding lead).

"The polymer core adds some flexibility to the structure, *significantly improving the mechanical strength of the assemblies by preventing the formation of cracks in the joints",* explains Sébastien Bucher, head of coated powder technologies research. *"By way of comparison, these hollow-core balls are 200-300% more reliable in thermal cycles than standard ball solutions",* he continues.

Innovation creates a French solder ball industry

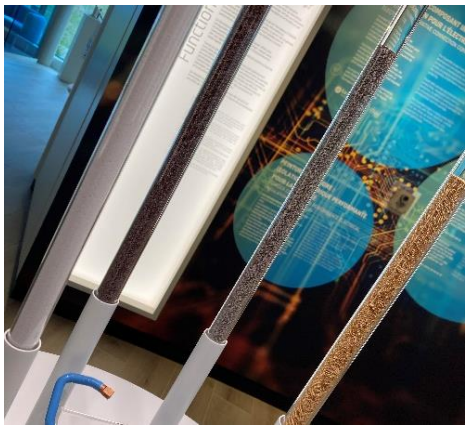
The project began when Thalès made a request to IREIS, HEF's R&D centre. This major innovation required two years of research and €800,000 in investments and the achievement will enable the

development of a French industry for high-performance multi-material hollow-body solder balls. In 2021, the project received financial support from the Auvergne-Rhône-Alpes Region (a €234,000 grant) and Bpifrance (a €238,000 interest-free loan).

To date, IREIS has already produced several tens of thousands of Superballs for technical qualification by our industrial partners. The challenge is to move on to a larger-scale manufacturing phase to bring costs down. Many manufacturers are interested, particularly in the Auvergne-Rhône-Alpes region.

For French industries, it is essential to develop a French source to ensure long-term supply (a sovereign source with no risk of restrictions on use) and to offer innovative balls to improve the reliability of assemblies at a price close to current solutions.

Superball 2 aims to conquer the global consumer electronics market



HEF's surface coating technology allows three successive coatings to be applied to these balls, with the final one being a gold finish. *"If we apply other finishes, we can access other markets that don't use the same soldering techniques", says* Guillaume Dubois, in charge of coated powder technology development.

The Superball 2 project will strengthen the leadership of the electronics sector in the Auvergne-Rhône-Alpes Region through regional and international collaboration and the participation of HEF, Thalès and STMicroelectronics.

"A pre-feasibility study shows that the AURA region is particularly well positioned in the electronics sector, with more than 150 entities likely to be consumers of this innovation! This will enable us to surpass production volume thresholds by 2030. Superball is a very long-term, large-scale project", concludes Bertrand Nicolet, IREIS innovation manager at HEF.

ABOUT HEF

HEF is a world leader in surface material engineering, a challenger in photonics, and an emerging player in hydrogen technologies. Our head office is located in Andrézieux (Loire department) and we operate in 21 countries with 3,200 employees and an annual turnover of €317 million. We offer our customers a comprehensive range of services, from research to industrial development, including process operation, component supply and technology transfer. HEF was founded 70 years ago and employee ownership is a cornerstone of our development.

Contact :

communication@hef.group