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High density SiC for PVT

Development of high density, high purity SiC material for SiC crystal growth

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Nanomakers at a glance



A worldwide leader in industrial production (**40t/year**) of high-quality high-purity silicon-based nanoparticles (nano-silicon and nano-silicon carbide) for the Semicon & Battery industries



Located in France (Rambouillet) with an international impact

- R&D, Sales & Production based in Paris (France)
- Subsidiary in Japan (in 2010)
- 99% of sales outside of Europe



International team of 16 employees, out of which 6 are in R&I



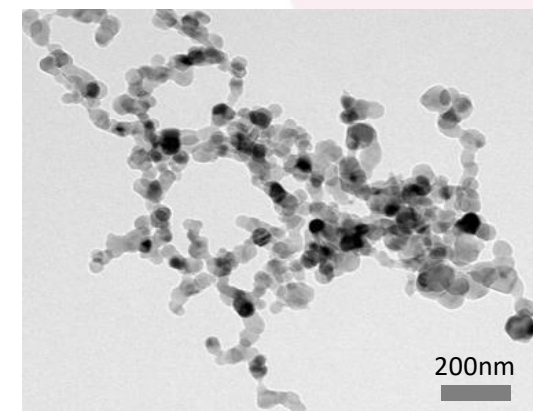
Active R&I activities

- R&I expenses represent more than 30% of our sales
- Patent families covering applications, products & processes.

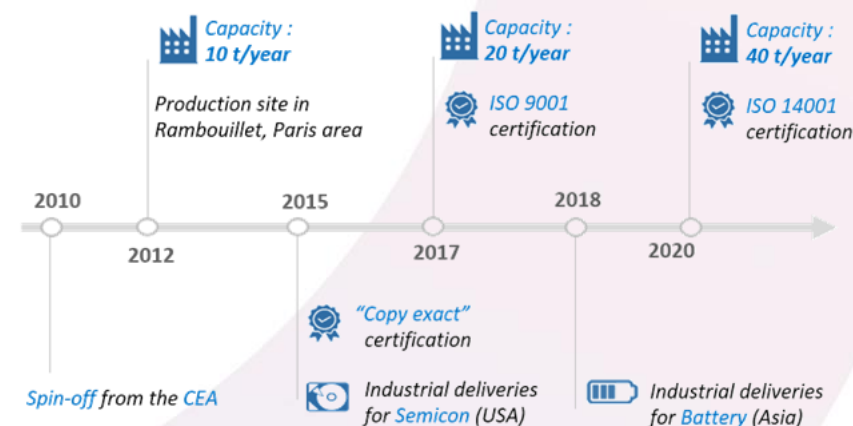


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Nano-SiC - 35nm size



Nanomaker's R&I Activities

- Previous experience with collaborative projects covering a variety of applications (Batteries, Ceramics Composites, others):
 - Partner of several Horizon 2020/Europe projects (including 2 on going)
 - Leader of 3 EIT Raw Materials projects
 - Leader of 2 French collaborative projects
- What sort of interaction exists with one of the 3IAs or other ETPs?
 - Experience as material supplier for semicon equipment parts producer
 - But new to this Semicon / chip ecosystem and associations
 - Recently applied to become a member of AENEAS

Collaboration Expectations

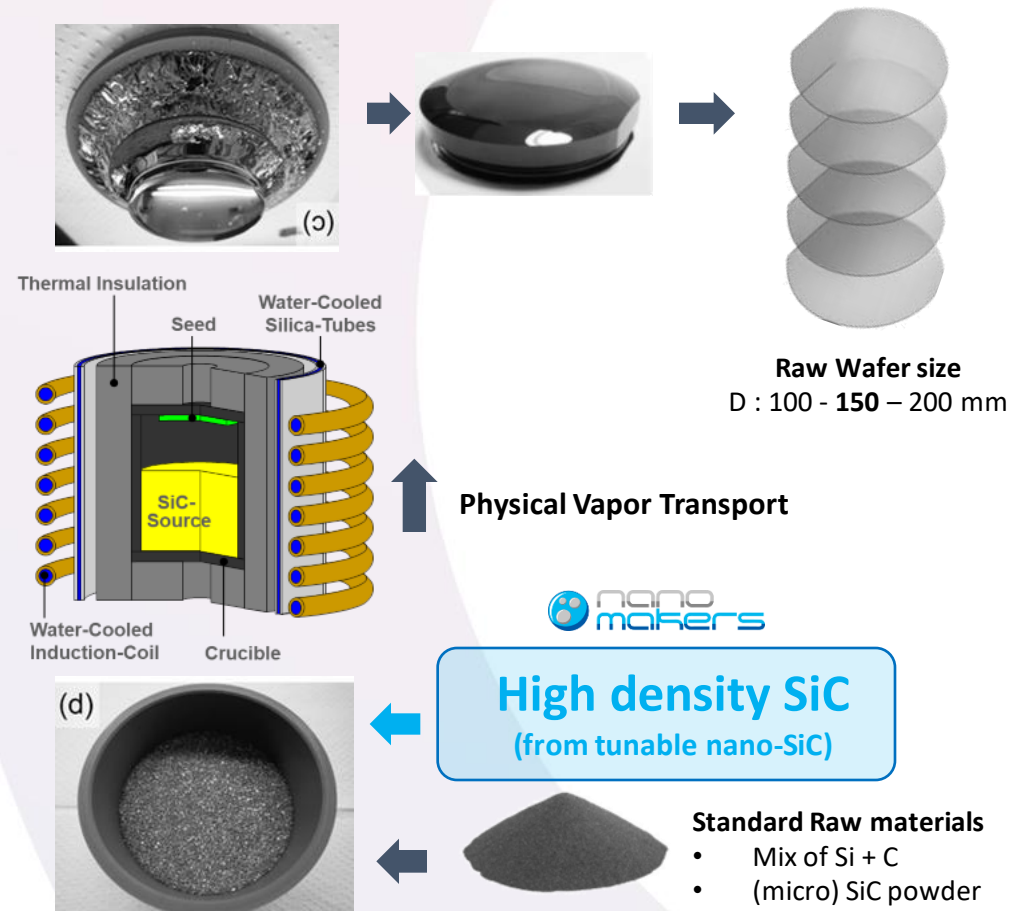
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Collaborative project of interest to you	<i>Chips JU, Horizon Europe, EIC accelerator</i>
Scope	<i>SiC source for SiC crystal growth by PVT</i>
Project idea	<i>To enhance the mass quantity of the SiC source by elevating its apparent density</i>
Project impact	<i>Higher productivity of SiC boule growth</i>
Project consortium	<i>Partner(s) in SiC PVT growth (equipment manufacturer, user) for co-development of ready to use solution</i>
<i>Other information (e.g. project budget, duration)</i>	<i>~ 2 years, budget depending on partner type</i>

Nanomakers SiC source for PVT

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Solution development : high density Silicon Carbide

- High apparent SiC source density to increase the productivity of SiC boule growth
- Tunable Si/C ratio at nanoscale level
- 5.5N + available
- Nitrogen doping agent on demand

Partners for co-development projects

- Boule manufacturer for SiC source/process adaptation
- PVT equipment supplier for SiC source/equipment proposal