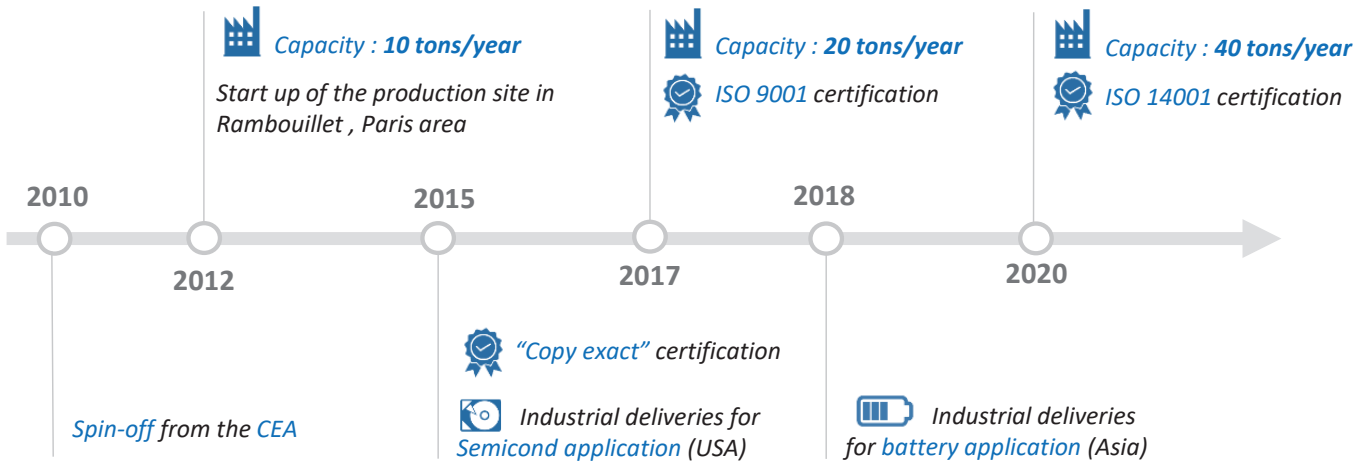
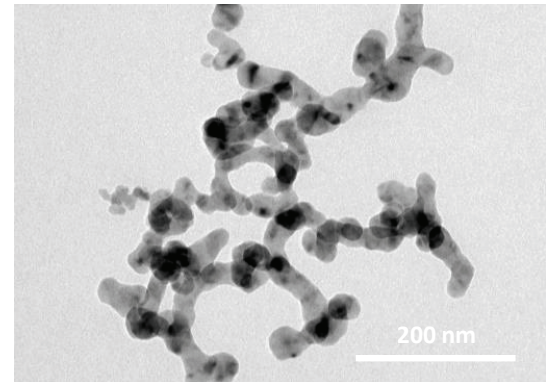
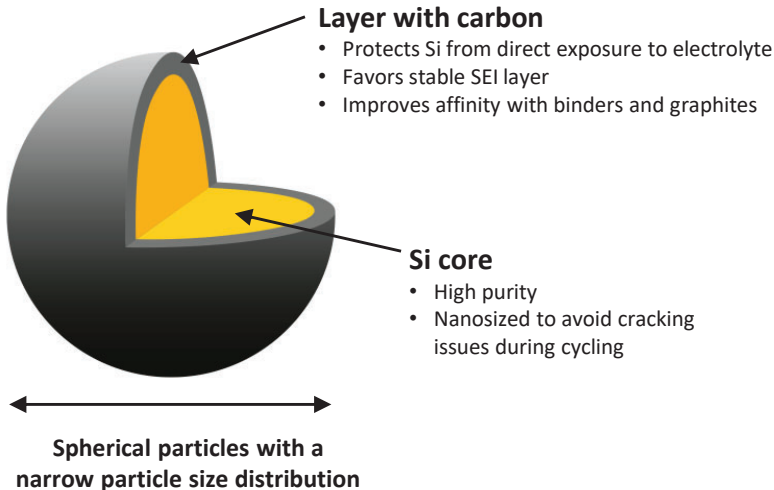


## Company Presentation

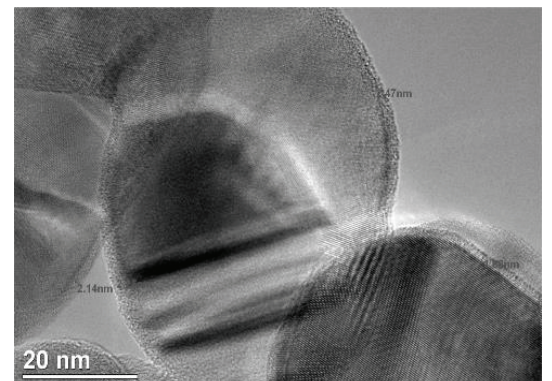
Nanomakers is a worldwide leader in nanosilicon powder production to be used as active material in high energy density anodes for Li-ion batteries. Nanomakers benefits from an exclusive license from the CEA to use its patented and world unique industrial process enabling the production of nanosilicon with a narrow particle size distribution, and a high purity, making it the best nanosilicon powder available on the market. Based in France (Paris area), Nanomakers exports to Europe, America and Asia.



## NanoSilicon product structure



TEM picture of NMSiQC99 @ 40nm

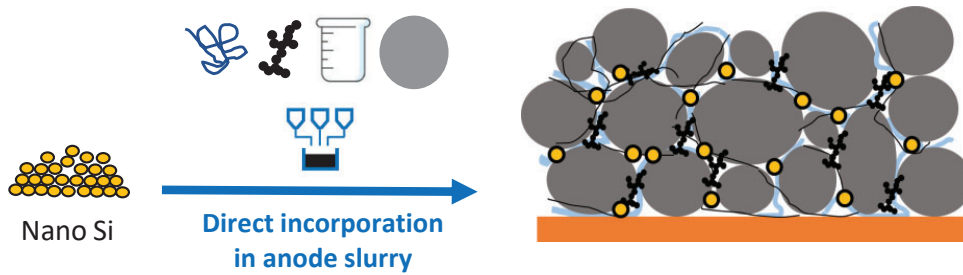


TEM picture of NMSiQC99 @ 40nm

Product category	Core	External layer	Diameter available
NMSiQC99	Pure Si	with carbon (1.5 - 2 nm thick)	40 nm
			75 nm
			100 nm
NMSi99	Pure Si	none	40 nm
			75 nm
			100 nm

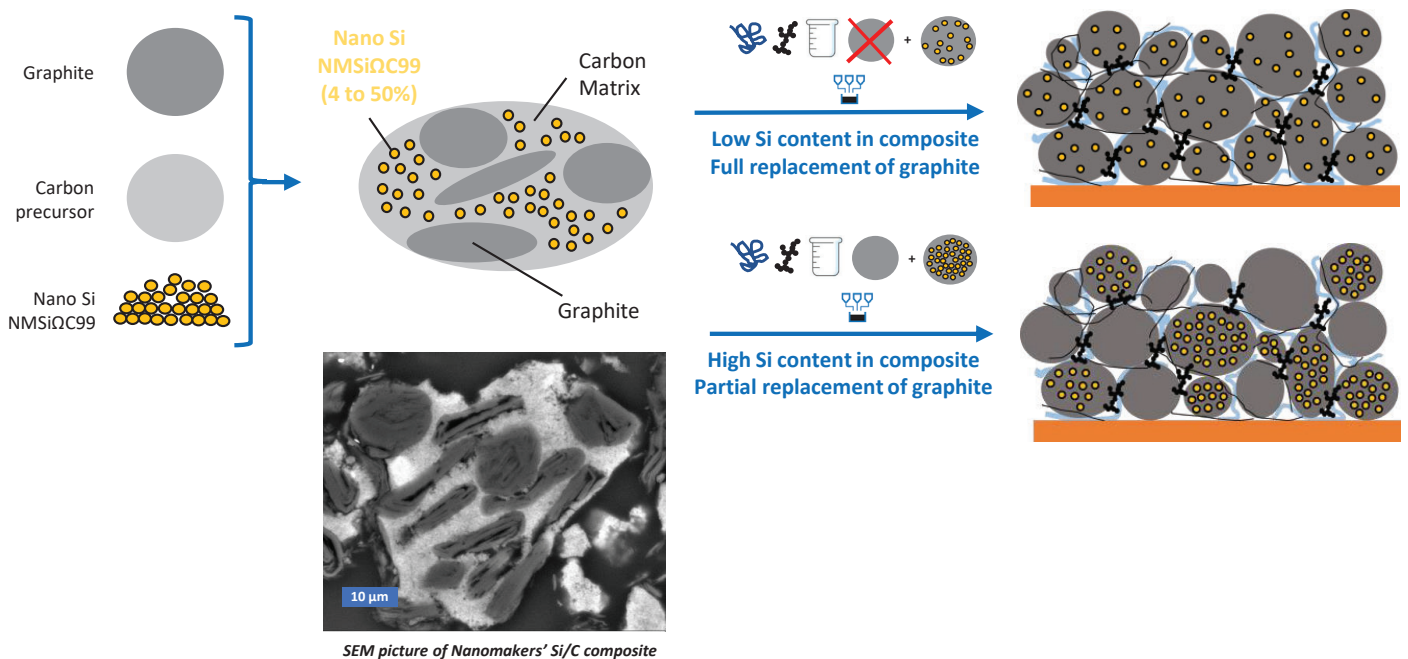
NanoSilicon grades available

## Low Si content : Direct incorporation in slurry (up to 600 mAh/g)



This approach consists of adding directly the nanosilicon particles (powder form) in the anode slurry preparation step using a planetary mixer (or similar). The maximum nano-silicon loading that can be incorporated using this method is usually around 5wt%. Above that loading, the total anode volume change and exposed particles with high surface area may create unstable SEI layer on the silicon particles and degrade cycling performances.

## High Si content : Silicon – Carbon composite (475 to 2000 mAh/g)



The composite approach consists of creating a new particle using an additional production step to combine the nano-silicon and the other carbon source such as graphite. The nano-silicon is no longer directly exposed to the electrolyte and its expansion is contained in the composite particle. This strategy allows for higher nano-silicon loading while ensuring longer cycle life performance. Two options are possible : using the composite with low silicon content as a complete replacement of graphite or partially replacing the graphite with a higher silicon content composite.

