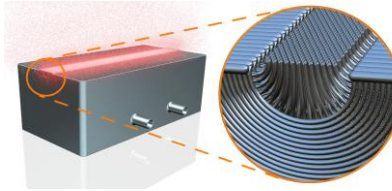




## TECHNOLOGY DESCRIPTION

The core of StarWarden's technology is a 3D-printed heat pipe array that is designed to address cooling challenges in sectors where thermal management is essential. Unlike traditional cooling systems, StarWarden's heat pipe array features a unique geometry and the innovative trapping of 3D-printing powder, allowing it to efficiently disperse heat from high-energy sources, e.g. artificial intelligence (AI) processors, fusion reactors, etc. This solution is especially valuable in semiconductor processing, where overheating limits performance, and in fusion energy, where sustained, controlled cooling is essential for reactor functionality. The technology's development involves a patented design, custom preparation (a protected trade secret) and rigorous quality control, including computer tomography (CT) scans for precision and reliability.



## INNOVATIVE ASPECTS

- The 3D-printed heat pipe array surpasses conventional cooling technologies in critical heat flux capacity, thermal resistance and operating temperature range
- The technology allows superior heat dispersion and temperature control without the high costs and limitations of direct water cooling or traditional heat pipes
- The patented design enhances performance through a controlled 3D-printing powder trap, which achieves heat management capabilities that competing solutions cannot
- The heat pipe array utilises advanced materials, like ammonia–aluminium composites for semiconductors (at room temperature) and lithium–tungsten composites for fusion reactors (operating at 1300 °C)
- High temperature operation allows the best work fluid (lithium) to reach it's optimal performance



## TECHNOLOGY READINESS

TRL 4 (2025)

## COUNTRY OF ORIGIN

Netherlands

## LATEST UPDATE

1/2025

SPACE  
FOR BUSINESS  
BUSINESS  
FOR SPACE

CONTACT



TAGS	#Extreme Cooling	#AI Semiconductors	#Fusion Reactors	#Heat Management	#Metal Manufacturing	#QualityControl
APPLICATION AREAS	Energy	Electrical & Electronic Engineering	Data Processing	Safety & Security	Software & AI	Structures & Materials