

Case story | Aeroquip FD83 coupling

## Rapid prototyping helps NVIDIA servers keep their cool

**Thanks to the rapid development of a brand new two-inch Aeroquip FD83 coupling, our Annemasse team helped NVIDIA meet the liquid cooling demands of its new data center cabinets.**

In 2021, the American software and fabless company NVIDIA, headquartered in Santa Clara, California, approached our team in Annemasse, France. The company needed urgent support to meet new liquid cooling requirements in high-end data center cabinets designed for challenging applications like high performance computing, deep learning, and data analytics.

### The challenge

Enable reliable and effective **liquid cooling** for powerful data center servers

Optimal thermal management is vital for modern data centers. Overly hot components function less efficiently and have a shorter lifespan. However, the trend towards more compact

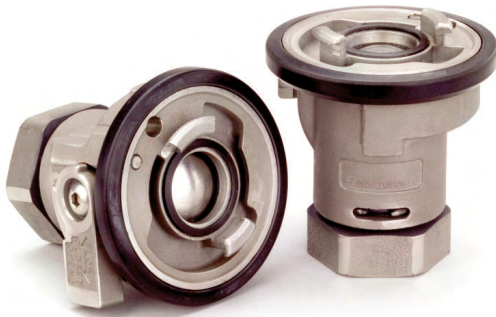
and power-hungry systems is driving up the temperature inside cabinets, meaning that traditional air cooling is no longer enough. Instead, NVIDIA relies on liquid cooling—using a Water/Glycol mix with 10 times the chilling effect.

Our existing Aeroquip FD83 couplings already offered the full flow, fluid compatibility, and safety that's essential for electronics cooling applications. In particular, the couplings feature a minimum pressure drop that's vital for low working pressure data center applications. However, NVIDIA's newly designed cabinets featured servers and processors that required a higher coolant flow rate to maintain an optimal temperature—making a larger, two-inch diameter version of the FD83 coupling an urgent necessity.

### The solution

**Rapid prototyping** of a new two-inch coupling

We were able to respond rapidly to NVIDIA's need for a larger FD83 coupling, since the team in Annemasse already had prototype drawings of a two-inch version. Lead engineer Sebastian Groh and engineering team leader Joffrey Bouterin quickly brought everyone together to review and redesign these initial drawings.



Evaluation of these design concepts showed that parts from the one-inch FD83 coupling could be adapted for use in the new two-inch variant. For instance, our patented safety locking system was able to be included in the larger version.

In just two weeks, the Annemasse team produced a 3D-printed prototype, meeting NVIDIA's tight schedule. Our engineers also stayed in close collaboration with NVIDIA throughout the process via weekly web meetings, guided by project manager Gokhan Ozkan.

“While one-inch FD83 couplings are something of an industry standard, our larger version can enable optimal liquid cooling for more powerful servers working on vital global challenges like climate change modelling, disease prevention, and deep learning.”

*Sebastian Groh, Lead Engineer, Danfoss*

### The results

## Fast turnaround of a successful solution leads to continuing collaboration

We successfully met NVIDIA's requirements for a new coupling design on an extraordinarily tight schedule. Our Annemasse team completed the first 20 prototype couplings in February 2021, fulfilling an initial \$20,000 order from NVIDIA. After testing the prototypes and resolving some minor technical issues, NVIDIA authorized the first \$200,000 production order of 600 couplings, which is currently on schedule. NVIDIA is now projected to require around 1,600 of these couplings per year on an ongoing basis.

As well as supporting enhanced cooling, the larger FD83 couplings also deliver the low pressure drop needed to ensure



Joffrey Bouterin, Alexandre Cornier, Ron Molijn, Sebastien Lafond, Quentin Maridor



the working pressure NVIDIA required for its new cabinets. Additionally, the couplings enable NVIDIA to reduce system downtime by closing valves, allowing equipment to be disconnected for maintenance without draining the whole liquid cooling system.

Even better, NVIDIA is now seeking further collaboration with us on a one-inch version of the FD83 coupling with a customized hose barb, as well as applications like manifolds using smaller-sized couplings. Congratulations to the whole team for this outstanding effort!

“I’m thrilled we met NVIDIA's requirements on such a tight timescale. Such a rapid turnaround is a real testament to our close collaboration with customers and the dedication of our team—including Joffrey Bouterin, Gokhan Ozkan, Christian Künstel, Enikő Virág, and many others.”

*Sebastian Groh, Lead Engineer, Danfoss*



# **FLUID POWER SOLUTIONS**<sup>®</sup>

**Find a location near you!**



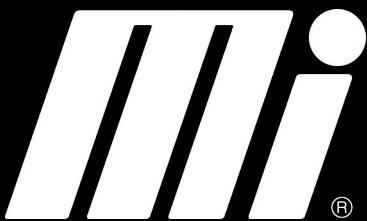
## **Mi Fluid Power Solutions**

Looking for specialized solutions for fluid power operations? Talk to the experts at Mi Fluid Power Solutions for expertise related to hydraulic power units, gearbox, and cylinder repair.

To view locations, scan QR Code or go to: [qrco.de/bd4Ofp](https://qrco.de/bd4Ofp)



© 2022 Motion



**MORE CHOICES. MORE INVENTORY. MORE EXPERTISE.**