D-ECKWEILER

connecting flow to purity

DATA CENTER

COOLING SOLUTIONS

FOR HIGH SPEED AND BIG DATA

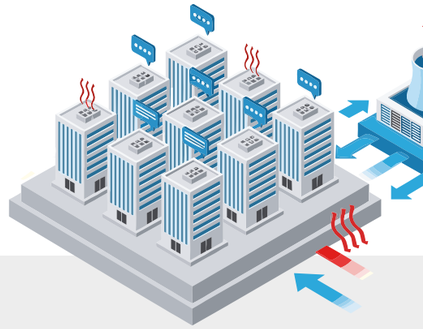
30 BILLION DEVICES

THAT IS THE ESTIMATED NUMBER OF ONLINE DEVICES IN USE IN 4 YEARS AND THESE WILL NEED TO BE SUPPORTED AND BACKED UP BY DATA CENTERS ALL OVER THE WORLD

- **The global data center market is projected to reach approximately U$700 billion by 2034.***
- **The compound annual growth rate (CAGR) is expected to rise by 11 percent over the forecast period.***
- **IT and tech giants investing billions in new data center developments to support their AI platforms**
- **Even a small 1 MW data center using a traditional cooling process can potentially use approximately 70,000 liters of water each day**

* Source: **www.fortunebusinessinsights.com**

COOLING SOLUTIONS ARE ONE OF THE KEY FACTORS



In addition to energy supply, cooling data centers is also part of critical infrastructure. High equipment density leads to significant heat generation. In extreme cases, this can result in malfunctions or failures.

Modular and scalable cooling systems are essential for stable and reliable operation. Applications from similar industries – such as the semiconductor industry – are a solid basis for the manufacture of reliable cooling systems: manifolds for process cooling water (PCW) are comparable components.

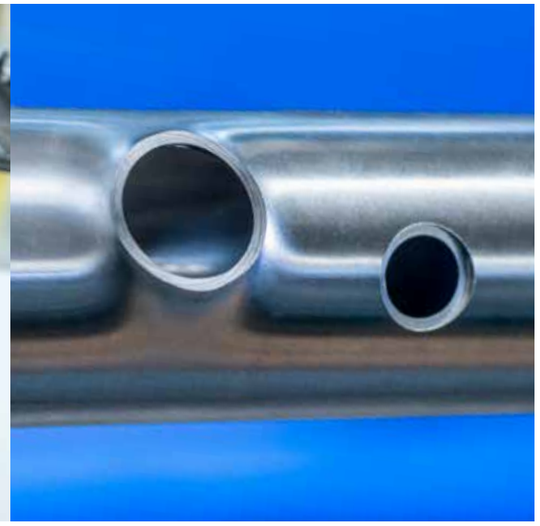
Danger for supply systems:
Glycol and black steel can lead to sludge or magnetite formation

DOCKWEILER MANIFOLDS FOR PROCESS COOLING WATER

Efficiency with prefabrication:
Supply lines for process gases and cooling water in a semiconductor factory (FAB) are prepared in modules, so-called „racks“, for final assembly. A large number of lines are precisely arranged here in a very confined space. Almost 300 „racks“ are needed for one FAB. Prefabricated manifolds from Dockweiler ensure efficiency during assembly and facilitate logistics.

Similar requirements for data centers
Corrosion plays an important role in protecting critical infrastructure. The selection of materials and solid fabrication are essential. Dockweiler has experts who bring their experience from large semiconductor projects to the table.

MATERIALS
AND MANUFACTURE



QUALITY IS THE BASIS TO STABILITY
AND EFFICIENCY

Alloy components and their influence on processing: As we know, there is no clear distinction between light and darkness. The same applies to sulfur as an alloying element in stainless steels: in addition to the advantages it offers in metalworking, there are also issues relating to corrosion resistance. An important indicator here is the so-called delta ferrite value. This is just one example of many when it comes to selecting materials for industrial applications.

Stainless steel in grades 304L/1.4306 and 316L/1.4404 are the preferred materials for cooling tube systems in data centers worldwide and are standard high-quality grades of Dockweiler tubes, fittings and components. For decades, the material has proven itself as the basis for sensitive flow systems in the semiconductor and pharmaceutical industries.

DOCKWEILER SPECIFICATIONS

Material Grades
Stainless steel 304L / 1.4306, 316L / 1.4404

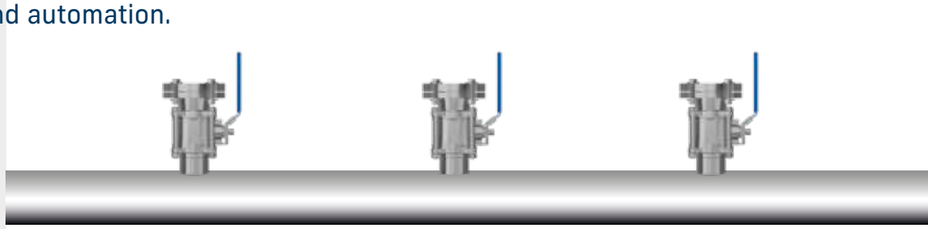
Surface conditions and roughness
- bright annealed, mechanically polished
- according Ra_{avg} ≤ 3,0 µm (Ra_{avg} ≤ 0,8 µm)

Dimensions
- 1" to 4" material in standard fractional sizes
- NPS 8" – 20", Schedule 10S acc. ASTM A312

Conventional design using welding tubes and T-pieces

EXPERTISE IN MANUFACTURING

Cutting-edge technology with over 30 years of experience: IO welding (3D inside-out welding method) developed by Dockweiler as well as specific collar processes have a key function in production. This includes precisely reproducible welding processes through parameter dat base and automation.



Dockweiler design with minimal welds

FEWER WELD SEAMS
MINIMIZE THE RISK OF CORROSION

Minimizing weld seams during installation on site will increase efficiency and also minimize risk.

These are the advantages:

1. High-quality stainless steel components ✔
2. Fewer weld seams minimizing risk of leakage (up to 70%) ✔
3. Advanced welding technology ✔
4. Comprehensive technical documentation ✔
5. Traceability from pre-material to final product ✔

8.000
POC‘S MAKE A CAMPUS

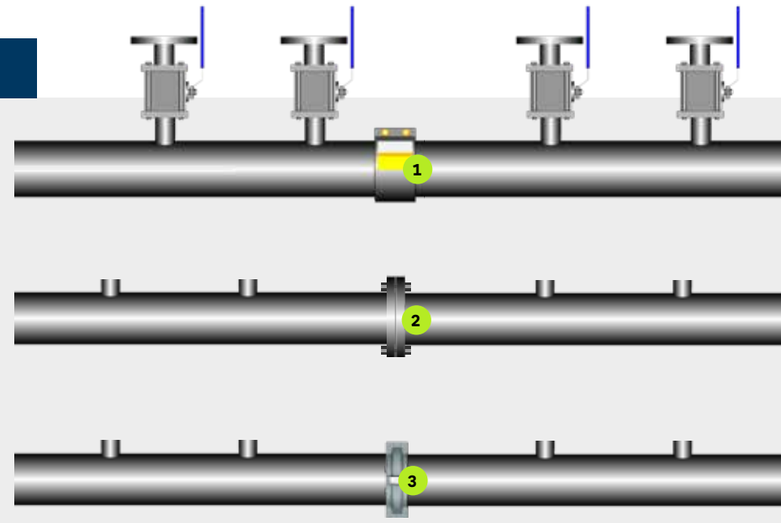
IMPRESSIVE FIGURES:

1 x PCW Lateral
OD: 4", Length 20 m (3 x 6 + 2),
POC: 20 x 2"

1 x Data Hall
10 x PCW Supply Laterals
10 x PCW Return Laterals

1 x Data Center = 4 x Data Halls

1 x Campus = 5 x Data Center
- 20 x 4 x 5 = 400 Laterals
  (8,000 m of 4" Tube)
- 20 x 20 x 4 x 5 **= <u>8,000</u> POC‘s 2"**



Dockweiler Solutions: PipeGrip (1)**, flange** (2) **or clamp** (3) **connection**
for easy installation without on-site welding

BIG NUMBERS
FOR COOL CALCULATIONS

Dockweiler has the latest technology and decades of experience. These are your benefits:

1. Pre-fabrication in a controlled environment
2. High class orbital weld technology with weld log and quality certification
3. Pressure test available
4. Total traceability, spools individually marked
5. Documentation package optional

That means:

1. **Reduced labor installation time and materials handling**
2. **Weld count reduced by minimum of 70%**
3. **Reduction of overtime, fast track projects**
4. **Significant cost savings with intelligent engineering**

30% - 40% SAVINGS
VS. CONVENTIONAL FABRICATION

Our goal is to develop the best solution for your process. This means cost savings in the manufacture of components and also in installation. We see ourselves as a technology partner for efficiency in the sectors of data center cooling solutions.

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