

**D-ECKWEILER**  
connecting flow to purity



**EXPERTISE.**  
**PRODUCTS. SERVICES.**

Tube systems and installation solutions for reliable processes  
in the semiconductor, pharmaceutical, analytical and fine chemistry industries.

# “PROCESS RELIABILITY

is our motivation – for processes in the semiconductor, pharmaceutical and biotechnology industries. ”



## We connect processes with the highest purity

Dockweiler is a leading international manufacturer of stainless steel tube systems. The core business is the development of installation solutions for handling fluid and gaseous media in the semiconductor, pharmaceutical analytical and fine chemistry industries.

### Our manufacturing expertise is your advantage

Thanks to our manufacturing expertise, we find solutions which are economical and offer high process reliability. Consultancy and services are key components for us because our customers see us as an engineering partner.

Our specialists have extensive knowledge about all specifications and consult competently on choosing the right products. Our engineers plan and develop tailor-made components with you and see it through to implementation.

### Cutting-edge products for processes with the highest purity

Dockweiler supplies standard products such as tubes and fittings for highly technical sectors. We also offer tailor-made installation solutions, which fulfill the highest requirements for purity and precision. With inventory holdings of more than 1,500 Kilometers in tubes and approximately 1 million fittings, we guarantee speedy availability.



### Customer service from the very start

The demands on industrial processes have increased steadily in recent years. The most important indicator of our performance is successful collaboration with our customers. Our service begins right at the planning stage: In addition to our product range, Dockweiler has continually developed its service features.

#### Dockweiler Expertise

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# “ MANUFACTURING EXPERTISE ”

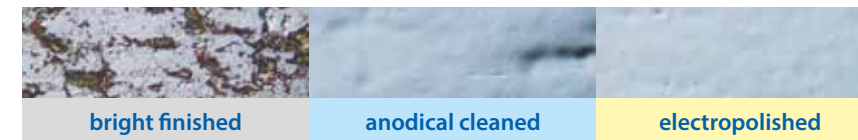
We develop products for the highest standards – we set standards with our surface treatment. ”



## Surface Treatment

### Treatment of inner surfaces for high purity

We have decades of experience in mechanical and electrochemical surface treatments and finishes and we offer **optimal quality for high purity industrial applications**. In addition to standard fittings and tubes, we also finish complex special components such as manifolds, CIP lances and bubblers. The spectrum of treatments ranges from **staining** to **mechanical processes** to ultra pure **electrochemical polish**. This 380 x magnification illustrates the differences between the surface treatments:



In anodic processes, the material is cleaned with a stripping force of 3 to 5 µm. **The material stripping is significantly higher for the electropolishing process: which is up to 20 µm.**

**ELECTROPOLISHED INNER SURFACE –**  
Extremely smooth and pure with a surface quality of up to Ra ≤ 0,13 µm

### Benefits of Surface Treatment

- optimal inner surfaces for high purity processes
- increased resistance to corrosion
- improved cleanability of the system
- reduced adhesion of particles due to extremely smooth surfaces



### Qualities for Liquids

<b>bright finished (SF1**)</b>	<b>bright finished (H3*)</b>	<b>bright finished (H4*)</b>
–	<b>anodical cleaned</b>	<b>anodical cleaned</b>
<b>electropolished (SF4**)</b>	<b>electropolished (HE3*)</b>	<b>electropolished (HE4*)</b>

### Qualities for Gases

<b>bright finished</b>	<b>bright finished</b>	–
<b>anodical cleaned</b>	<b>anodical cleaned</b>	–
–	–	<b>electropolished</b>

\* Hygiene grade in accordance with DIN 11864 / DIN 11865 / DIN 11866. \*\* in accordance with ASME BPE. \*\*\* not defined, Ra 0,80 µm on request



## Collaring

### We know how

The collaring of T pieces, CIP lances or manifolds is well-developed Dockweiler know-how. **Closely-spaced branches** often pose a technical challenge. This is routine for our specialists. In combination with our welding expertise, products are created which are characterised by a **particularly compact and flow-optimized construction**. Included in this are eccentric branches and branches with various angles (for example, T-pieces with 45 degree branches).

IO WELDING TECHNOLOGY FOR COMPLEX GEOMETRIES  
[Find out how that works here](#)



### Benefits of Collaring Technology

- homogeneous transition contour from the main tube to the branch tube
- streamlined flow behavior
- effective welding preparation
- complete reduction in space for example in the production of manifolds
- compact component geometry

## Welding Technology

### Decades of experience in cutting-edge technology

Dockweiler is a pioneer in the area of orbital welding. **With the 3D inside out welding technology (IO welding) we have developed new and exciting opportunities for innovative production capabilities.** In this way, closely-spaced branches and those with lower dead space are produced in a highly-efficient manner. This 3D internal orbital welding technology is **ideal for complex geometries** and innovative components.



### Benefits of Welding Technology

- 3D internal orbital welding technology for complex geometries such as 45° or 60° branches and saddle welds
- precisely reproducible welding processes due to a parameter database and automatization
- consistent quality thanks to Dockweiler orbital welding with pressure and residual oxygen monitoring
- minimization of  $\delta$  ferrite content
- low dead space and closely-spaced branches
- machine-controlled TIG processes
- 100% weld seam testing
- straightforward documentation with computerized processes



## Cleanroom Production

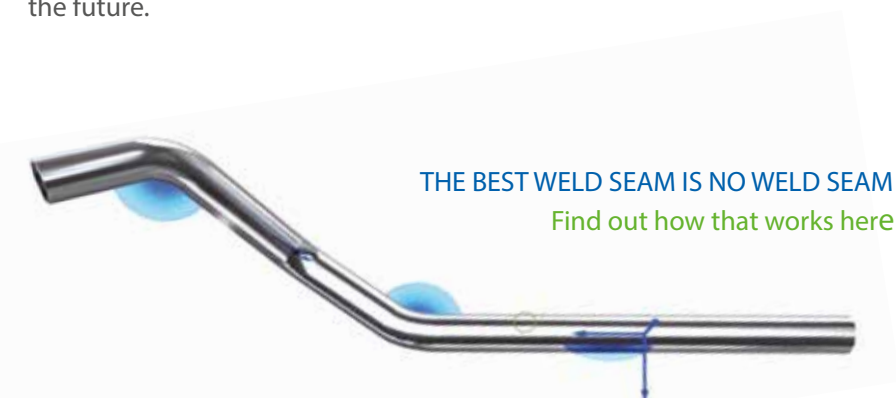
### High purity environment for high purity products

For products which are used in the semiconductor industry, production must take place in a high purity environment. There must be no contamination from foreign particles or residues. These conditions are only possible in the cleanroom. High purity products such as manifolds or Bubblers are welded, assembled, tested and packaged in the cleanroom.

For the most exacting requirements in cleanrooms, we rely on highly trained and experienced specialists. A high level of discipline and forward-thinking are among the demands we make of our employees. Regular training and further development in the area of cleanroom production ensures a high standard of product quality and thus your process reliability now and in the future.

### Benefits of Cleanroom Manufacturing

- orbital welding of manifolds, UHP systems or complex vacuum systems
- assembly of components such as valves and bubblers
- quality checks and leak detection using Helium leak testing
- residue-free cleaning
- particle-free packaging
- from production to packaging: everything takes place in a self-contained work process



## 3D Bending

### Fewer weld seams for more reliability and purity

With our 3D bending technology, we are in the position to reduce the number of welding seams to a requisite minimum. This is particularly advantageous in complex tube systems.

Along with our collaring expertise and our welding know-how, we produce space-saving and dead-space-optimized solutions for custom applications.



### Benefits of 3D Bending Technology

- minimization of weld seams for aspects of hygiene and safety
- CAD-construction and automatic production
- 3D measuring technology and documentation
- mid-process inspection for quality assurance

# “ PRODUCTS FOR HIGH PURITY PROCESSES. ”

Whether it's a standard product or a custom solution – everything is made to Dockweiler's high quality standard. ”



## Tubes and Fittings

### Standard Dockweiler products

Our standard products satisfy the highest surface quality and purity standards. They are used to transport fluids and gases in the semiconductor, pharmaceutical and chemical analysis industries, and further high tech industries. Our standard products include tubes, elbows, T-pieces, reducers and caps.



#### Technical Data

##### Dimensions

Imperial:	1/8" - 6"
ISO:	DN 8 - DN 200
Metric:	DN 4 - DN 150
Pipe:	DN/NPS 6 - DN/NPS 20

##### Materials

1.4404, 1.4435, UNS S31603 (316L), 1.4539, UNS N08367 (AL-6XN), UNS N08904 (904L), UNS N06022 (C22)

##### Surface

- Ra ≤ 0,80 µm - ≤ 0,13 µm
- bright finished, anodical cleaned, electropolished

##### Standards

ASME-BPE, DIN 11865, DIN 11866, ASTM A269/A632/A312 (pipe)

## COAX Tubes and Fittings

### The double-wall tube for critical media

With the COAX double-wall tube system we offer a safe solution for the safe transport of explosive, toxic, corrosive or highly viscous media. COAX consists of an internal process tube and an external safety tube. This allows for a control alert in a monitoring system for gas leakage. Another example could be steam monitoring for viscous media.

FOR CRITICAL MEDIA: ►  
The COAX double-wall tube system



#### Technical Data

##### Dimensions

Imperial:	1/4" - 1"
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##### Materials

1.4404, 1.4435, UNS S31603 (316L)

##### Surface

- Ra ≤ 0,80 µm - ≤ 0,13 µm
- bright finished, anodical cleaned, electropolished

## Presslok

### The alternative to welding

The Presslok system complements our product line. It allows for very quick, reliable and reproducible tube connections for process cooling water, inert gases or low-pressure systems, without any welding.



#### Technical Data

##### Dimensions

Imperial:	1/2" - 4"
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##### Materials

UNS S31603 (316L), UNS S30403 (304L)

##### Pressure Resistance

1/2" - 1 1/2": 20 bar and 2" - 4": 13 bar

## Customized Fittings

### When standard does not meet the requirements

Customized fittings manufactured to your specifications are the tailor-made solution when standard fittings do not meet customer requirements. Our service starts with drafting and extends to 3.1 documentation. Customized components include:

- **T-pieces with excentric branch** for residue-free drainage
- **branches with various angles**, e.g. 45° or 60°
- **flow-optimized Y-pieces**
- **180°-elbows with branch**, called "Point-of-Use" elbows



## Connection Components

### To integrate instrumentation and control elements

Dockweiler connection components give you the option of integrating instrumentation and control elements to control temperature, flow rate and pressure in your system. These are manufactured for both gases and liquids, depending on the customer specification. Instrumentation T-pieces can be equipped with various sensors, which measure for example the flow rate while the system is in operation.

In addition to threaded, flanged or clamped connections, the Dockweiler connection components can also be equipped with the patented ZeroCon connection. With our many years of manufacturing expertise, we ensure low dead space design and a flow-optimized profile.

**PURGE TEE**  
For connecting measuring and control elements ▶



### Technical Data

#### Dimensions

Imperial, Pipe, ISO, Metric

#### Materials

1.4404, 1.4435, UNS S31603 (316L), 1.4539, UNS N08367 (AL-6XN), UNS N08904 (904L), UNS N06022 (C22)

#### Surface

- Ra ≤ 0,80 µm - ≤ 0,13 µm
- bright finished, anodical cleaned, electropolished

#### Standards

ASME-BPE, DIN 11865, DIN 11866, ASTM A269/A632/A312 (pipe)

All custom fittings are prepared with weld-optimized ends. Finally they are appropriately cleaned and packaged. They are available in all current materials and in all Dockweiler surface qualities.

### Technical Data

#### Dimensions

Imperial, Pipe, ISO, Metric

#### Materials

1.4404, 1.4435, UNS S31603 (316L), 1.4539, UNS N08367 (AL-6XN), UNS N08904 (904L), UNS N06022 (C22)

#### Surface

- Ra ≤ 0,80 µm - ≤ 0,13 µm
- bright finished, anodical cleaned, electropolished

## Connections

### For a wide range of applications

We offer an equally diverse range of stainless steel tube systems with corresponding connections and gaskets in Dockweiler quality. For the safe connection of tubing components, our range includes aseptic screw connections, clamp or flange connections in accordance with demanding pharmaceutical standards, as well as standardized TriClamp connections.

For the highest purity and leak tightness, we offer our customers the patented ZeroCon connection and Dockweiler Cap.



Clamp connection

Dockweiler Cap

DIN 11864

ZeroCon

### Technical Data

#### Dimensions

Imperial: 1/4" - 1"

#### Materials

1.4404, 1.4435, UNS S31603 (316L), 1.4539, UNS N08367 (AL-6XN), UNS N08904 (904L), UNS N06022 (C22)

#### Surface

- Ra ≤ 0,80 µm - ≤ 0,25 µm
- bright finished, anodical cleaned, electropolished

## Gaskets and O-Rings

### Total traceability

Traceability from production to assembly is already an industry standard for quality stainless steel components. In contrast traceability for elastomers ends with installation. Without packaging a clear identification is no longer possible.

All Dockweiler gaskets are laser marked and satisfy USP Class VI and are made from FDA approved materials. This way, we are able to ensure total traceability, required in particular for pharmaceutical facilities.



**DOCKWEILER LASERMARKED GASKETS**  
For total traceability ▶

### Technical Data

#### Dimensions

Imperial: 1/4" to 6"  
ISO: 13.50 mm - 114.30 mm  
Metric: 6.00 mm - 154.00 mm

#### Materials

PTFE, FKM, PTFE/FKM, EPDM, VMQ, PTFE/316L, PTFE/EPDM



## Flexible Hoses

### PolyFlow – technical hoses

Dockweiler hoses made from high quality elastomer and thermoplastic produce flexible connections for system components. They have all necessary approvals (like FDA, USP, Class VI) and comply with the pharmaceutical requirements. For us, every hose is one of a kind: Lengths, connections and materials can be mixed and matched and are tailor made. TriClamp, aseptic connections, welding ends and ZeroCon are available as connectors. Dockweiler hoses are used in the chemical and pharmaceutical industries as well as the food sector and biotechnology sector. They are used wherever quick and flexible connections are required.



◀ DIVERSE CONNECTION OPTIONS:  
Dockweiler hoses with TriClamp, aseptic connections, welding ends, ZeroCon and flared PTFE-liner

### Technical Data

#### Measurements

Nominal Size: 1/4" - 2"  
Length: up to 40 m  
Temperature Range: from -60 °C to +180 °C

#### Material

Internal liner: EPDM, silicone, PTFE, PTFE electrically conductive (external)



### Flextron – the “flexible” stainless steel tube

The Dockweiler Flextron corrugated hose was developed for the semiconductor and fine chemical industries. The highest demands are placed on the purity of the process media in these industries. Flextron's electropolished inner surface allows for these requirements to be met in all aspects of the supply system - wherever a flexible connection is needed.

Flextron is manufactured from mechanically corrugated stainless steel (1.4404), as standard. An additional braid of stainless steel wire ensures a higher pressure resistance and protects the hose from damage. The unique combination of an electropolished surface and a flexible corrugated hose minimizes the risk of contamination and enables gas transport under full UHP conditions throughout the system. With Flextron, oscillations and vibrations can be decoupled and done to the highest purity standards.



Flextron with VCR connection

Flextron with ZeroCon connection

Flextron with optional wire braid and welding ends

### Technical Data

#### Connection Sizes

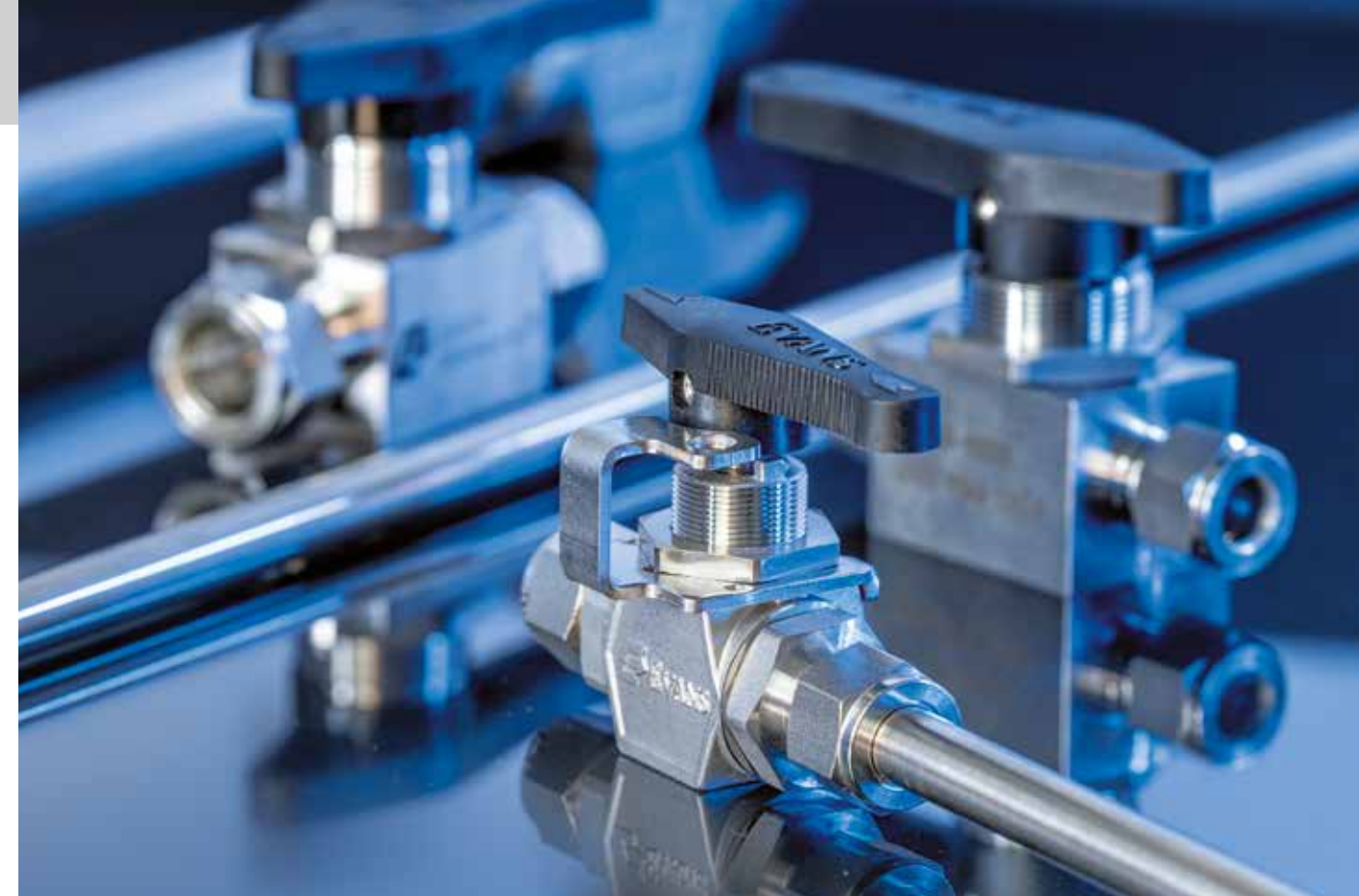
1/4" - 1"

#### Material

1.4404, UNS S31603 (316L)

#### Surface

- range from Ra ≤ 16 µin to ≤ 10 µin
- electropolished



With its components, Dockweiler ensures highly reliable, hygienic and efficient control in the production process. Depending on the application requirements ball valves or T-valves are used.

## Ball Valves and Valves

### T-valves

These components combine a premium diaphragm valve and high quality stainless steel tubing to reduce weld seams and dead space. We orbitally weld a valve body directly to a T-piece branch collar. This technique combines hygiene and cost savings in a pharmaceutical installation. The T-Valve is the ultimate alternative to Standard diaphragm valves with large dead space or very expensive block valves.



### Ball valves

We categorize our ball valves into one-, two- and three-part versions. Ball valves are available with weld ends, VCR, compression fittings or flange connections, depending on the size and application. For valves with compression fittings, our VSR80 tube is the ideal combination.

### Technical Data

#### Dimensions

Imperial, ISO, Metric

#### Materials

1.4435, 1.4404, UNS S31603 (316L), UNS N08367 (AL-6XN), UNS N08904 (904L), UNS N06022 (C22)

#### Surface

- Ra ≤ 0,80 µm - ≤ 0,25 µm
- bright finished, anodical cleaned, electropolished

### Technical Data

#### Dimensions

Imperial, Metric

#### Materials

UNS 31603 (316L)/PTFE

#### Surface

- Ra ≤ 0,63 µm - ≤ 0,38 µm
- bright finished, electropolished

COMPLEX COMPONENTS FROM DOCKWEILER:  
Customized solutions suitable for your requirements ▶



## Customized Solutions

### Special, single or small-scale production

Dockweiler is your manufacturing specialist when it comes to the realization of complex installation projects. Maximizing productivity is the primary objective. This requires a highly reliable, efficient and hygienic solution. Our manufacturing technologies guarantee low dead space and optimal surfaces.

Whether individual or small batch, contract or special production, our team of experienced specialists will support you and translate your requirements into suitable technical solutions. At Dockweiler we offer a unique combination of manufacturing expertise and technology for customer-specific solutions.

### Technical Data

#### Dimensions

Imperial, ISO, Metric, Pipe

#### Materials

1.4404, 1.4435, 1.4539, 2.4602, UNS S31603 (316L), UNS N08367 (AL-6XN), UNS N08904 (904L), UNS N06022 (C22)

#### Surface

- Ra ≤ 0,80 µm - ≤ 0,13 µm
- bright finished, anodical cleaned, electropolished

## Process Vessels

### For safe transport and storage

Dockweiler process vessels comply with the highest standards for storage, transport and removal of critical or high purity media - for example organometallic compounds in the fine chemistry or semiconductor industry. Our HPS series makes us the only manufacturer worldwide to offer Bubblers for applications using solid media.

From the stainless steel melt selection and the most accurate orbital welds to the completely electropolished inner surface (Ra value ≤ 10 µin), our containers offer the typical high Dockweiler quality.

Extensive testing of the whole Bubbler protects the environment and people. All our process vessels are Helium-leak tested up to 4 x 10<sup>-9</sup> atm-cc per second.



### Technical Data

#### Materials

1.4404, 1.4435, UNS S31603 (316L), UNS N08367 (AL-6XN), UNS N08904 (904L), UNS N06022 (C22)

#### Application Areas

for fluids (HPL and ECO series) and solids (HPS)

#### Volumes

from 200 ml to 56 l

#### Surface

- Ra ≤ 0,80 µm - ≤ 0,13 µm
- bright finished, anodical cleaned, electropolished



## Welding Equipment

### The innovative EcoPurge system

The EcoPurge System was developed to provide purge gas control and monitoring while orbital welding tube systems. Specifically the ID tool is designed for use with either CFOS or EP tubing systems without affecting surface quality.

EcoPurge drastically reduces the volume of purge gas required for welding by creating a purge dam. While reducing consumption the tool also monitors O<sub>2</sub> concentrations and pressure in the weld zone. Together this allows for very quick, accurate, and colorless welding results. General reduction of 95% gas volume and up to 60% labor savings can be achieved.

### Welding rings for stainless steel

Product safety plays a primary role in the production of pharmaceutical materials. Unwanted microscopic structural components, that are formed during a welding process, can be minimized, so that the material quality of the weld seam corresponds to that of the base material. Dockweiler welding rings significantly reduce the formation of ferrite and thus ensure a ferrite content of less than 3% in the weld seam. For alloys with a high Molybdenum-content can be embrittled and formation of corrosive components so reliably counteracted.



◀ IDEAL FOR THE SEMICONDUCTOR AND PHARMACEUTICAL INDUSTRIES:  
Specially developed for UHP and CFOS applications



# “ DOCKWEILER-SERVICE FROM A TO Z

Our expert knowledge for your processes: analyses, assessments, consulting, training and much more for your success. ”



## Laboratory Services

### Analyses, assessments and more

Quality is inextricably linked to our products and the manufacturing process. For example, a T-piece for the semiconductor industry is subjected to up to 50 different tests before it reaches the customer. Our Quality Department does not just put our own products through their paces. Dockweiler also offers a broad range of laboratory services for third parties.

Our services extend from Positive Material Identification (PMI), X-ray inspections, Cryo tests, surface analyses, corrosion tests to pure gas analyses and Helium leak testing. In our own laboratory, we will be pleased to carry out the tests required for your products.



## Material Consultancy and Metallurgy

### Which stainless steel material is the right one?

Are you not sure which stainless steel material is the right one for your application? Or would you like to know the difference between UNS S31603 and 1.4404? Our metallurgists will help you out and will be glad to advise you on the right choice of materials and on technical questions, such as weldability or corrosion resistance.

How does the sulfur content affect the welding seam or what properties does ferrite have? These are just a few of the common questions. Our experts offers consulting and technical support.

## Cleaning Processes

### For various industrial applications

Different industries and application areas have different requirements for the cleanliness of media contact surfaces. Thus Dockweiler offers a variety of different cleaning processes. From cleaning internal surfaces in accordance to ASTM A632, S3 or dry cleaning processes. Up to the most high-tech ultra pure and proprietary vacuum cleaning process with subsequent residual gas analysis. With our cleaning processes we ensure the cleaning of highly complex geometries and even capillary structures.

We supply the product purity you need for your process.

## Engineering Services and Application Know-How

### For technical customized solutions

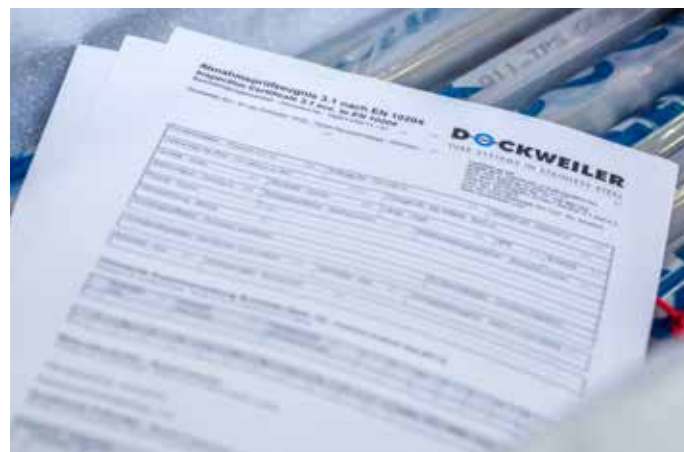
We understand the specific challenges of diverse industries in the transport of high purity media. All our expertise flow together into our engineering know-how. In close contact with our customers we take ideas, rough sketches and develop them into tangible, technical, customized solutions. **“If you can draw it, we can make it”.**

Take advantage of our engineering services with optimized manufacturing processes, customer-specific solutions and new developments. With decades of know-how in the pharmaceutical and semiconductor industries we are engineering partner to industry and research.

## Technical Documentation

### Material and test reports also online

Dockweiler is taking documentation quality to the next level with the WebCert digital certificate portal. All our certificates and test reports are available via this optional service. It means that our customers can view documents online as soon as the goods leave our warehouse. This service is a big plus for plant operators in particular. Material test reports and production documentation are becoming increasingly important.



FIND OUT MORE:

You can find more information about WebCert here ►



## Training

### Know-how transfer from Dockweiler

We not only attach a great importance to the training of our employees, we also offer our customers the opportunity to undergo training at Dockweiler on “stainless steel tube systems”. In addition to regular webinars, we publish posts on YouTube for different topics.

We also provide interested installers, technicians and customers with the opportunity to study further directly in Neustadt-Glewe at one of our Dockweiler Academy events.



◀ FIND OUT ONLINE:

Link to our YouTube channel



## Logistics and Warehouse Service

### Quick availability for standard products

Availability is paramount to our customers. As a result, we maintain a stock of more than 900 miles of tubes and a million fittings and gaskets in our six international central storage facilities. These can be delivered within 24 hours, upon request. Equally important for us are thorough cleaning and safe packaging of our tubes and fittings so that they arrive ready for immediate use. Operating in a more flexible way enables classical consignment warehouses as well as Dockweiler swap trailers and contain-

ers as mobile storage on construction sites. The containers can be used to execute installation and production projects (SKID manufacturing or distribution system installations).

Since 2011 we have been an AEO(C) authorized economic operator by customs and since 2013 we have been certified as a known consignee. This guarantees faster customs clearance and thus shorter delivery times.



Certificates



AD 2000 HPO



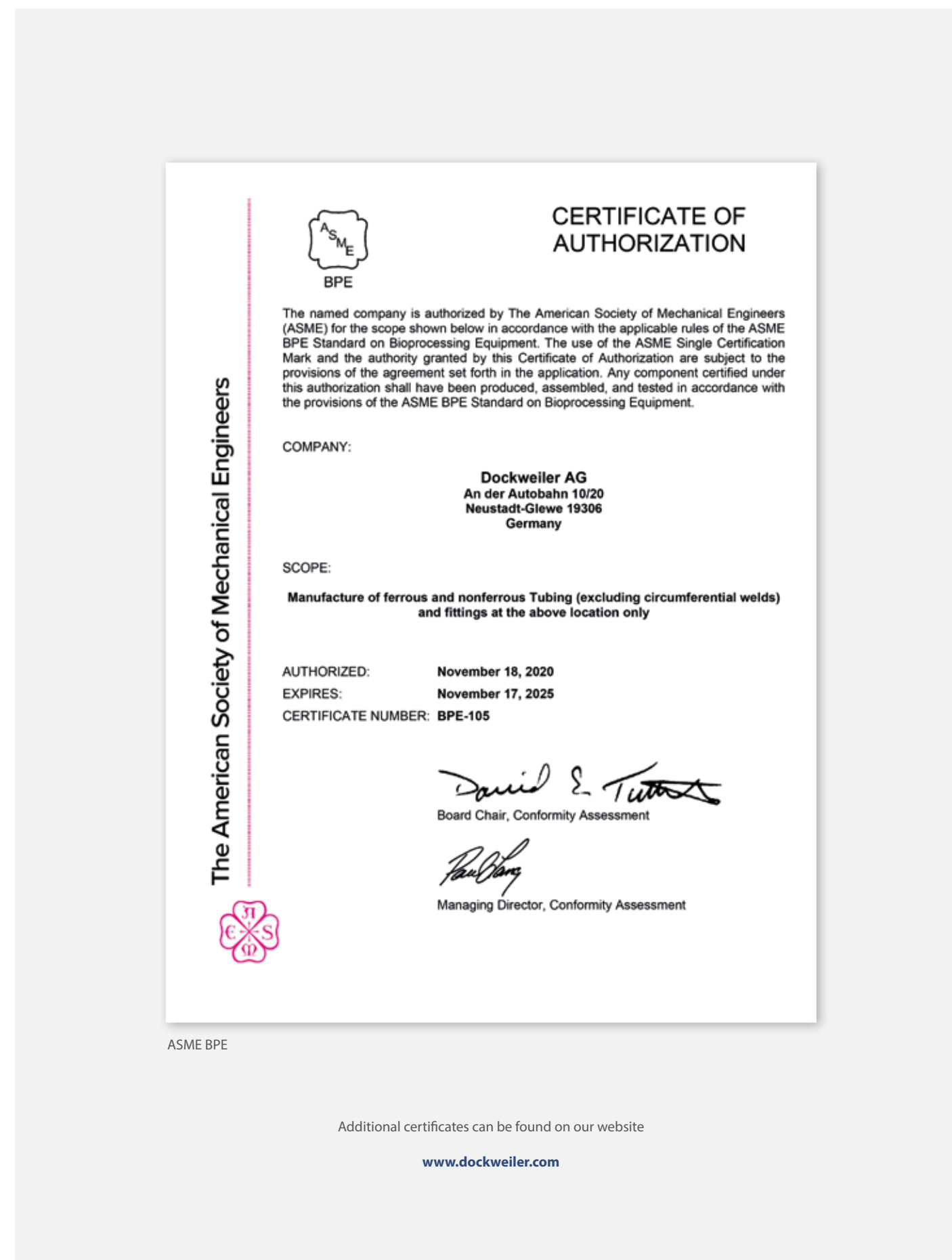
DIN EN ISO 9001



DIN EN ISO 14001



PED 2014/68/EU and AD 2000 WO



ASME BPE

Additional certificates can be found on our website

[www.dockweiler.com](http://www.dockweiler.com)

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