



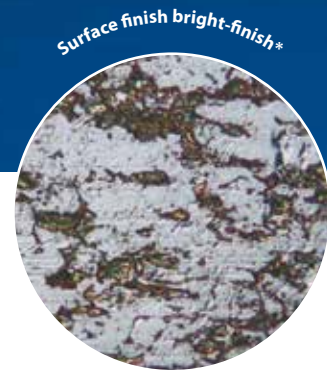
D-ECKWEILER
connecting flow to **purity**

UHP SOLUTIONS

FROM THE TECHNOLOGY LEADER

Ultra High Purity Stainless Steel Tube Systems and
Components for the Semiconductor Industry.

A PIONEER FROM THE START. NOW A TECHNOLOGY LEADER.



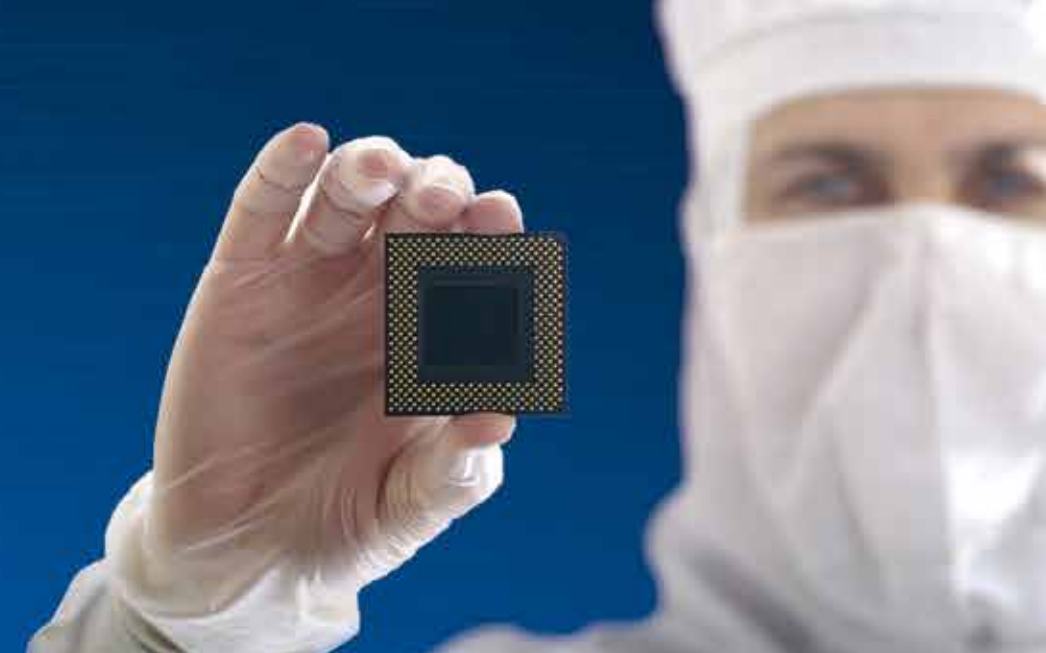
Surface finish bright-finish*



Surface finish anodically cleaned*



Surface finish electropolished*



* All images show the surfaces magnified x 380

Special surfaces provide the highest level of purity for production.

Dockweiler stands for years of experience and expertise in surface optimization and finishing.

Dockweiler is one of the pioneers among providers of UHP tube systems. Since the introduction of personal computers in the early 1980s, the company has been developing and manufacturing UHP tubes and fittings for the semiconductor industry. Today, Dockweiler offers stainless steel tube systems and components for all UHP media and processes, from thick-walled UHP tubes right through to prefabricated cleanroom laterals. Options for flexible UHP gas connections, UHP process vessels and connection systems with no dead space complete the product range.

Year by year, microprocessors are getting smaller and much more efficient. The purity requirements for the production process are extremely strict. Even the most minimal level of contamination in the production environment can make sensitive products such as microprocessors unusable.

The production environment – including peripheral systems for gases for vacuum generation – must be free of any contamination. UHP tube systems therefore require an extremely clean surface. A whole range of factors can significantly impact the purity and quality of the entire facility.

Excellent material properties, optimal system design, reduced dead space, and the welding process used are the key elements that ensure optimal system performance. The cleaner the inner surface of a system, the better its evacuation and purging properties.

The quality of a weld seam affects the purity of the gas being transported: an interaction with the weld seam can lead to reduced performance. For this reason, weld seams should be smooth, with no heat tint. Discoloration is a sign of oxidation during the welding process. This can give rise to particles that contaminate the system.

At Dockweiler all welding processes are carried out using the GTAW method and the suitable gas mixture of flushing and protective gas to ensure the highest degree of purity.

Whether in the semiconductor and solar industry, in vacuum systems and laser technology or in aerospace applications, this rapid development poses ever-new demands on UHP line systems. Together with our customers we take up these challenges: **Dockweiler – connecting flow to purity.**

	bright-finish	bright-finish	-	-
	anodically cleaned	anodically cleaned	-	-
	-	-	electropolished	electropolished
36 µin	TCC **			
32 µin				
28 µin				
24 µin				
20 µin				
16 µin		finetron		
12 µin				
8 µin			puretron	ultron
4 µin				

** Not defined, Ra 32 µm on request

WE ENGINEER SOLUTIONS. FOR THE REQUIREMENTS OF TOMORROW.

R4i Laterals.

Ready for installation.

As an engineering partner, Dockweiler offers custom assemblies that meet the highest standards of purity and precision.

A key indicator of our performance is our success in collaborating with our customers. Our bespoke UHP solutions are one outcome of this collaboration: for example, laterals made of corrosion-resistant materials, featuring complex 3D design, minimal dead space, and easy-to-clean surfaces.

R4I LATERALS

The R4i lateral was developed to simplify all UHP installations. The prefabricated manifold is collared and then welded, tested and packaged in a Class 10 (ISO 4) cleanroom in accordance with ISO 14644-1. The use of R4i laterals cuts times for the entire installation process and acceptance through faster purge times and a reduced particle count.

Every special part is tested by our quality assurance staff for compliance with international and national standards and dispatched to you with full documentation.

Benefits:

- Improved dry-down times, minimized dead space
- SEMI-compliant specification (UHP)
- Fewer weld seams and lower valve costs
- Reduced total cost, prefabricated and ready to install
- 100% helium leak tested
- Orbital weld seams for the highest quality
- Full documentation

Sizes

Imperial, ISO, metric
According to customer requirements

Options

We offer the following connection options: R4i laterals with welding ends or a ZeroCon connection.

Surfaces Bright-finish, anodically cleaned, electropolished

Materials 1.4404, 1.4435 (BN2), 1.4306, 1.4307 / UNS S31603 (316L), UNS S30403 (304L)
In addition to our standard materials, special materials such as Hastelloy are available on request.



ZEROCON. AS TIGHT AS A WELD SEAM.



ZeroCon.
The new, patented connection system made of 100% stainless steel.

ZeroCon is the easy, efficient solution if you want a new connection that is built to last. It combines all the advantages of a detachable connection with those of a welded connection. For this reason, ZeroCon can also be used in all UHP applications.

ZEROCON

The unique threaded connection is as completely leakproof as a weld seam (helium leak rate $< 10^{-13}$ mbar l/s).

Sizes

Imperial	ISO	Metric
6.35 mm to 101.60 mm (1/4" to 4")	DN 8 to DN 80 (13.50 mm to 88.90 mm)	DN 4 to DN 100 (6.00 x 1.00 mm to 104.00 x 2.00 mm)

Benefits:

- Electropolished surface available
- No dead space
- Completely leakproof
- Temperature- and pressure-stable
- Maintenance-free
- Meets the highest purity standards

Surfaces Bright-finish, electropolished

Materials UNS S31603 (316L)

FLEXTRON. PURE FLEXIBILITY.



Flextron.
Corrugated stainless steel hoses for pure flexibility.

The use of flexible tube systems is becoming increasingly important in the semiconductor industry as well as in some areas of the fine chemical industry. Dockweiler has developed a method for manufacturing electropolished corrugated stainless steel hoses. This guarantees a level of surface purity that meets the strictest of requirements and allows for flexible connection to your facility with minimal use of space – all in electropolished stainless steel.

FLEXTRON

Electropolished, corrugated stainless steel hoses for the semiconductor and fine chemical industries.

Sizes

Corrugated hose
DN 6 to DN 20
Connection: 1/4" to 1"
(6.35 x 0.89 mm to 25.40 x 1.65 mm)

Options

We offer the following connection options: the corrugated hose with welding ends, a VCR connection, or a ZeroCon connection.

Surfaces Chemically cleaned, electropolished

Materials Corrugated hose: 1.4404 / UNS S31603 (316L), braiding: 1.4301 / UNS S30403 (304L)

When combined with our ZeroCon connection, Flextron can be connected easily to an existing supply system with complete leak-proofness.

Benefits:

- Optimized, electropolished inner surface
- Clear needle marking guarantees traceability
- Available with welding ends, VCR, or ZeroCon connection
- Reduced particle contamination
- Improved purging behavior
- Flexible connection of components to UHP standards
- Less particle generation in dynamic applications

WELDING WITH ECOPURGE. MAXIMUM SAVINGS IN TIME AND GAS.



EcoPurge.

The new, efficient purging system for the welding of tube systems in the semiconductor and pharmaceutical industries.

Dockweiler, together with Evans Components Inc. is offering this new, highly effective solution for installing large-diameter, high-purity tubes: the patented EcoPurge system minimizes both the amount of purified argon used as a welding gas and the purge time for O₂ evacuation.

How EcoPurge works: It creates a closed circuit in a specific section of the tube system, which is filled with purge gas. Welding can then take place in this oxygen-free environment. This method reduces purge times and the consumption of UHP forming gas. It also increases the reproducibility of weld seams.

The EcoPurge system is made exclusively of materials that are either already present in UHP tube systems or others that will not impair the UHP system.

Benefits:

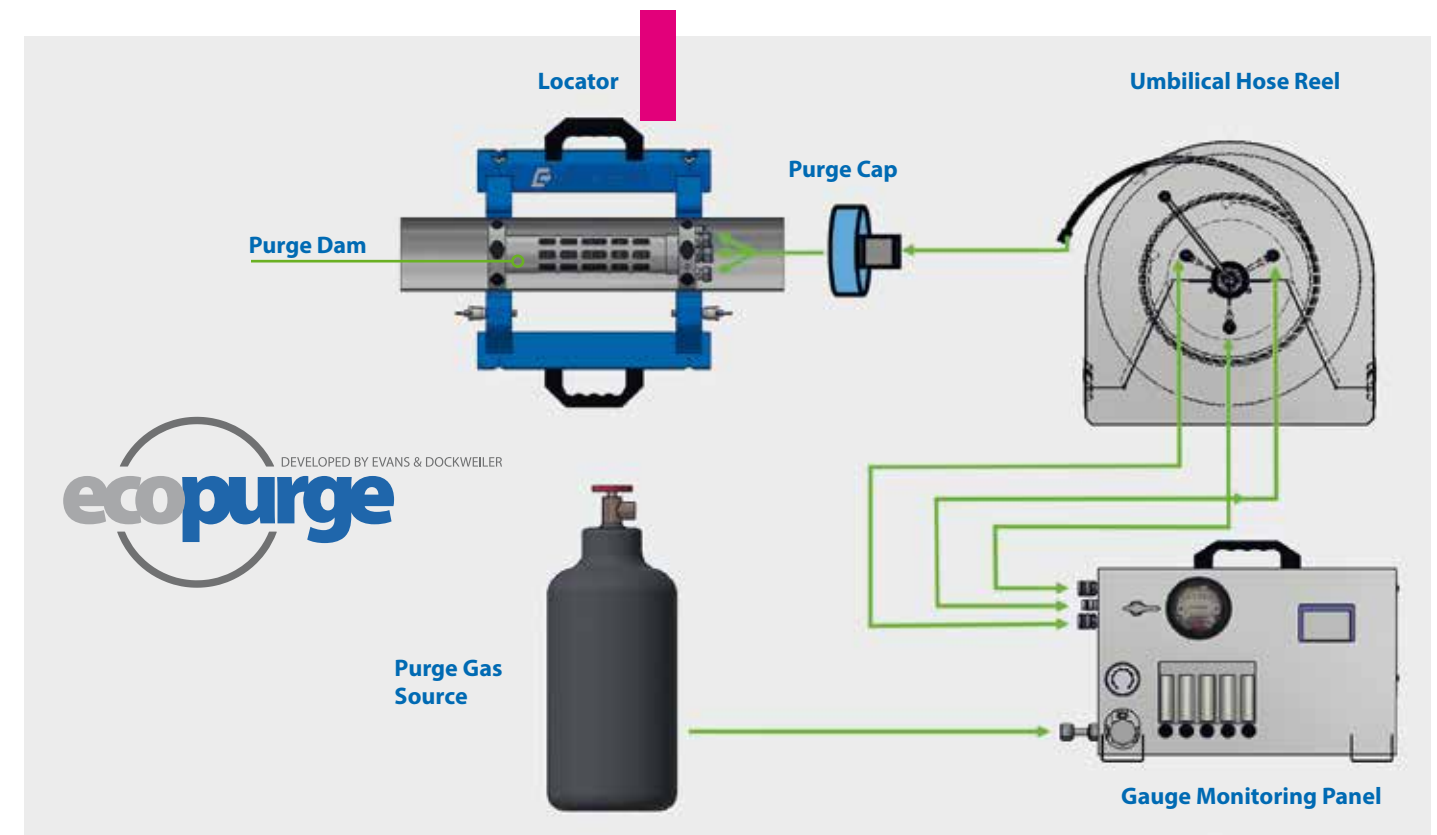
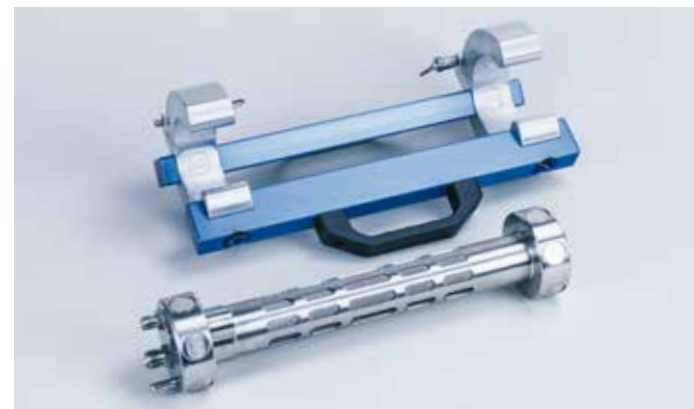
- Provides > 90% reduction in purge gas consumption
- > 65% reduction in purge and welding time
- On-site oxygen and pressure monitoring
- Weld inspection with optional borescope
- Available in sizes 3" to 12"

ECOPURGE

The use of the innovative EcoPurge system reduces purge gas consumption during welding due to the minimized volume. This in turn reduces the purge time.

Sizes

Available in 3", 4", and 6" (tube size) and 6", 8", 10", and 12" (pipe size)
ISO and metric sizes on request



BUBBLERS. MORE THAN JUST VESSELS.



HPL



HPS



Eco



Accessories

Bubblers. For special media

Safety in stainless steel – Dockweiler bubblers are vessels for the transport and manufacture of organometallic compounds. As well as the conventional bubblers for liquids, Dockweiler offers solids bubblers for special media.

Benefits:

- For liquids and solids
- Minimized dead space
- Electropolished, incl. the last weld seam
- DOT and ADR approved

SERIES HPL

Bubblers for liquids

Volume

ca. 200 ml to 56 liters

Options

Crossover and various other valves
Level sensor

Approvals

DOT and ADR

Surfaces p = free of oil and grease / hp = electropolished / uhp = electropolished (incl. the last weld seam)

SERIES HPS

Bubblers for solids

Volume

ca. 600 ml to 6 liters

Options

Crossover and various other valves
Level sensor

Approvals

DOT and ADR

SERIES ECO

Bubblers for liquids with specially optimized components

Volume

ca. 1.5 liters to 8 liters

Options

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Approvals

DOT and ADR for ECO8000

Materials

1.4404, 1.4435 (BN2), UNS S31603 (316L)
Other special materials such as UNS S30403 (304L), 904L, Hastelloy, or Monel available on request

AUXILIARY EQUIPMENT

Heat exchanger system for bubbler temperature control

HE8002 temperature control unit

Larger bubblers cannot be used in conventional tempering baths. Dockweiler offers the flexible HE8002 temperature control unit for this. This is supplied with a temperature-controlled liquid that keeps the temperature of the medium in the bubbler constant.

Supply, temperature, and control unit

In the sensitive production process, keeping the temperature of the medium constant is a must. To ensure this, Dockweiler offers a control unit that, in combination with the temperature control unit, guarantees temperature stability within a range of 0.2°C.

QUALITY. SURFACE QUALITY AND PURITY.



Surface technology.
Quality knows no compromise.

Dockweiler offers specific surfaces for safe equipment: bright-finish, pickled, anodically cleaned, or electropolished. With decades of expertise and experience in surface optimization and finishing, we can give our customers the very best advice on how to implement the requirements of their specific application – up to Ra 0.13 µm!

Chemical surface treatments such as pickling with strong oxidizing acids achieve surface removal of 1-3 µm. This is a very efficient cleaning process that leaves a mat finish because surface removal is non-specific.

In electrochemical processes such as anodic cleaning (3-5 µm) and electropolishing (20 µm) surface removal is specific, resulting in a shiny finish. In the first case, the material is cleaned - in the second, it is also significantly smoothed. Through subsequent treatment in the clean room, the products can be packaged in a particle-free condition and thus meet the highest purity standards.

In the semiconductor industry – particularly in gas and vacuum applications – one key objective is to optimize and reduce purge times. The quality and purity of the surfaces in the tube systems has a significant impact on both the safe operation and the efficiency of the equipment.

To transport high purity process gases safely to the required locations, we have developed special surface finishes that are used by all well-known semiconductor manufacturers.

Benefits:

- Resistance to corrosion
- Purity
- Improved cleaning
- Reduced particle count
- Free of volatile contaminants

CLEANROOM. FOR SEMICONDUCTOR APPLICATIONS.

All-in-one Service:
Production, testing, and packaging.

Cleanroom production: to meet ever-increasing standards in terms of surface quality and product purity, we can weld, assemble, test, and package high purity assemblies such as laterals and bubblers in our cleanroom. We currently have around 100 m² of Class 10 (ISO 4) cleanroom area.

In addition to our core expertise in orbital welding, we also offer helium leak testing and residual moisture and particle measurement in the cleanroom environment. Our innovative UHP solutions make on-site installation easier and safer – with obvious time and cost advantages.



WELDING TECHNOLOGY. REDEFINED.



Weld seams. The highest quality standards.

For decades, Dockweiler has been a leader in quality and innovation in the field of welding technology. As standard, we offer the TIG/GTAW method in orbital welding, purging with the shielding gas argon, and discoloration-free welding.

By constantly developing our welding processes and optimizing processes in direct consultation with all the big-name manufacturers of orbital welding machines, we have gained unrivalled expertise that places us at the leading edge.

For example, we have developed the so-called ID welding method. In contrast to the traditional OD method (from outside to inside), it allows us perform welding from the inside to the outside on fittings and laterals. The advantages of this method are that the uniform weld seam surface is located on the inside and the branches can be welded much more closely to each other, with minimal dead space.

Whether orbital or manual welding, or angled or eccentric 3D welding, no one knows their craft better than our welding experts.

Benefits:

- Mechanical TIG welding
- High quality, reproducible weld seams
- Minimized dead space
- Short distances between branches
- Controlled weld seam due to welding from the inside to the outside
- Welding of very small diameters (inner diameters of up to 4 mm)



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