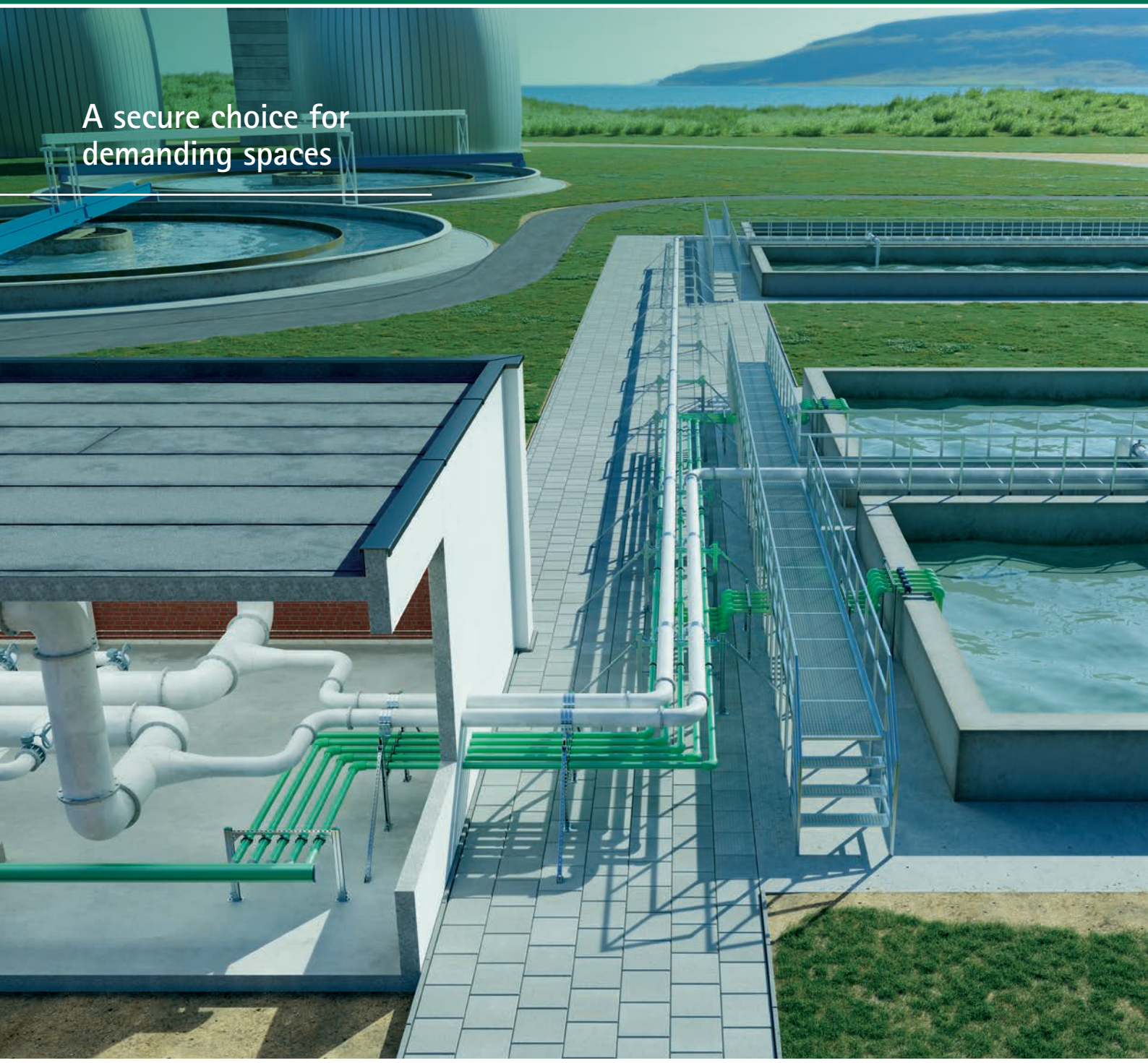
walraven



Stainless Steel Support Systems

A reliable, on time and complete product, system and service offer

Inspired by smart
solutions from the start

Walraven was established in 1942. Our founder, the great-grandfather of our current CEO, was an inventor with a love for simple and smart solutions. And now, more than 75 years later, we are a globally active company in the installation industry, committed to develop simple, yet smart product systems. With our wide product range and expert advice, we can provide complete solutions for any project, no matter how large or complex.

Walraven. The value of smart

A secure choice
for demanding spaces

Due to its advanced technical properties and increased affordability, Stainless Steel has become a popular choice of material over the years.

Even though Stainless Steel is known for its high corrosion resistance, one needs to be aware of the main corrosion contributors, environmental factors and even possible material combinations before selecting material for a given environment.

The purpose of this brochure is to provide a basic understanding about corrosion, the core applications of Stainless Steel as well as recommendations for maintenance and how to combine different materials in the field.

What is corrosion?

As defined by the ISO 8044:2020, corrosion is the physico-chemical interaction between metallic material and its environment. This interaction results in changes in the properties of the metal, and this may lead to significant impairments in its functioning, the environment itself or the technical system which the metal is part of.

The primary contributors of so-called atmospheric corrosion are generated by the following environmental factors:

- Physical factors such as high and low temperature
- Moisture, primarily the result of humidity, rain or being close to sea
- Chemical factors like sulphur dioxides and chlorides
- Biological factors, for example fungi, organic acids and salt

Different materials react differently to these factors depending on their corrosion resistance, which is the ability of a metal to maintain serviceability, functioning without impairments under given circumstances.

In the Walraven portfolio, depending on the needs and corrosiveness of your environment, you can find the most suitable and compliant surface treatment protection you need, ranging from zinc coating, Hot Dip Galvanised and BUP (BIS UltraProtect® 1000) solutions to Stainless Steel products.

What is Stainless Steel?

Patented back in 1912, Stainless Steels belong to a family of iron-based alloys and are specifically designed to be placed in highly corrosive environments as well as spaces with high hygiene standards and possible chemical exposure.

Thanks to its high (over 11-12%) chromium content, Stainless Steel has a high corrosion resistance compared to regular carbon steel. Whereas in carbon steel the iron will oxidise, forming brittle rust, the chromium content will protect the Stainless Steel from oxidising. Instead of the steel itself, the chromium will start oxidising, forming a very thin and tight layer of chromium oxides that protects the object from oxygen attacks. Corrosion resistance of Stainless Steel can further be enhanced by adding more nickel.

Other metal protection methods such as zinc, phosphate and special painting each have their own mechanism to protect the iron from oxidising. However, that may be less protective and sometimes less attractive as they will continue covering the metallic luster.

Next to its strength and corrosion resistance, the clean and minimalistic design also make Stainless Steel a popular material to be used in spaces where the metal is more exposed to the eye.

Stainless Steel grades – A2 vs A4

The two most commonly produced grades of Stainless Steel are 304 (also known as A2) and 316 (also known as A4.. Both of these grades are designed to offer corrosion protection, but there are some fundamental differences between the two.

While A2 Stainless Steel contains 18% chromium and 8% nickel, A4 Stainless Steel contains >18% chromium, >8% nickel, and the corrosivity resistance is further enhanced by adding about 3% of molybdenum. The molybdenum content of the metal makes this grade suitable to be used near salt-water, marine and coastal areas. In addition, the molybdenum component also provides the metal with better protection against chemicals such as chlorine and other halogenic ions like fluorine. While Stainless Steel does not require a lot of maintenance, it does not mean that the material does not need to be cleaned once in a while.

In industries like food processing, for example, maintaining excellent hygiene is critical. To this end, the cleaning in this type of sectors is often done using chemicals, which are typically aggressive to all materials in the space. In these environments, the required installation material is often A4 as A2 does not perform well in environments with aggressive chemicals. Even in environments where hygienic requirements are not very strict, through the use of ordinary detergents, the metal can already get exposed to chemicals, and that can already affect the performance of A2 graded Stainless Steel. Generally, the recommended and most secure way of cleaning A2 graded Stainless Steel is using clean water with no detergent content.

In summary, even though A2 Stainless Steel is a commonly used grade, primarily because it is a lower-cost option, A4 Stainless Steel is the best and most secure choice even if the metal components are not used in a harsh or highly polluted environment. Despite their high corrosion resistance, Stainless Steel constructions are also vulnerable to corrosion. Therefore the choice of the right material is critical. Even when selecting a product or surface protection method for a lower corrosivity class, one should not underestimate the long term impact of organic corrosion. Considering all potential circumstances, A4 delivers the peace of mind you expect from Stainless Steel.

Corrosivity classes

Considering the ratio and presence of different environmental factors explained earlier, such as temperature or humidity, environments are categorised into so-called corrosivity classes depending on the severity of the corrosion factors present.

Classes range from C1, being the environment with almost no corrosive elements to C5, being highly corrosive and CX, referring to extreme corrosivity and applications that require customised support and special care. Depending on the severity of corrosion, Walraven offers different surface protection solutions. See table below for more guidance.

Applications	Corrosivity class**	Recommended surface protection method*			
		Zinc coating	Hot dip galvanized	BUP (BIS UltraProtect® 1000)	Stainless Steel A4 (AISI316)
Dry indoor spaces Heated spaces with clean air such as offices, schools, stores and hotels.	C1, C2	x	x	x	x
Indoor spaces with occasional condensation Unheated areas where condensation may occur. For example, in storage spaces or sports halls.	C1, C2	x	x	x	x
Outdoor areas with low pollution Significant, over 10km distance from sea.	C2, C3	-	x	x	x
Outdoor areas with moderate pollution 1 to 10km distance from sea. For example, industrial areas and coastal areas with moderate salt impact.	C3, C4	-	-	x***	x
Coastal areas Less then 1 km distance from sea. For example, coast and offshore areas with high salt content.	C4, C5, CX	-	-	-	x
Outdoor areas with heavy pollution Including industrial areas with high pollution atmosphere, petrochemical areas and parking garages with high emissions.	C4, C5, CX	-	-	-	x
Extreme/special applications For example, tunnels, swimming pools, chemical industry or roads and areas treated with de-icing salts.		Please consult us for more information			

** Please consider the content of the table as guidance over explicit recommendation for a certain material or product.*
***According to ISO 12944.*
**** BUP (BIS UltraProtect 1.000) can be used depending on your environment. Please consult us for more information .*

Walraven understands the complexity of selecting the right material in corrosive environments.

The Walraven offer

We understand the complexity of selecting the right material in corrosive environments. Next to having decades of experience in surface protection, we also have deep expertise in the installation market.

To this end, Walraven offers a complete range of Stainless Steel portfolio suitable for the most typical application areas. We offer a universal A4 graded portfolio covering light and medium-heavy applications, which provides you with the peace of mind you need under the most common circumstances.

Ease of installation is the essence of our product design, making installation on the field as safe and fast as possible. Upon request, Walraven also supports with the design and the pre-assembly of the system. If you have questions about the cleaning and maintenance of Stainless Steel or need a solution for a specific environment, please reach out to us.

Compliant- A4 graded portfolio

Wide application coverage

Complete offer

Prompt product delivery

Expertise & know how

Pre-and onsite project support

Applications

Resistance to corrosion and staining, low maintenance, and easy cleaning make Stainless Steel an ideal material for many applications. For this reason, the use of Stainless Steel is highly recommended in areas such as food and beverage industry, water treatments plants, pharmaceutical industry and outdoor areas (for example near coastal areas) where there is either a high degree of corrosion exposure present or hygiene requirements are very strict and metals are typically cleaned with aggressive cleaning materials.

Resistance to corrosion, low maintenance, and easy cleaning make Stainless Steel an ideal material for many applications

Stainless Steel portfolio from Walraven

Find and select the combination you need

HD Clamps SSt Lined / Unlined M12 - M16

BIS Bifix® Clamps SSt Lined / Unlined M8 - M10

BIS RapidStrut® Rail SSt

BIS Strut SSt T-shape Base Plate

BIS RapidStrut® SSt Slidenut G2 / Tabs

BIS RapidRail® SSt Fixing Rail

BIS RapidStrut® SSt Cantilever Arms

BIS RapidStrut® SSt Baseplate G2

BIS Strut SSt Beam Clamp

BIS Rapid® SSt Rail Wall Plate

BIS SSt Rail Connector 90° / 135°

BIS SSt Rail Prop

BIS Strut SSt Beam Clamp 41x81

BIS Strut SSt Cross Connectors

BIS Strut SSt Connectors

BIS RapidRail® SSt Slidenut and Hammerfix

BIS SSt Fixpoint Consoles

BIS Expansion SSt

BIS Strut SSt Adjustable Support

BIS RapidStrut® SSt Wall Plate Hinged

BIS Strut Connector 90° 2D

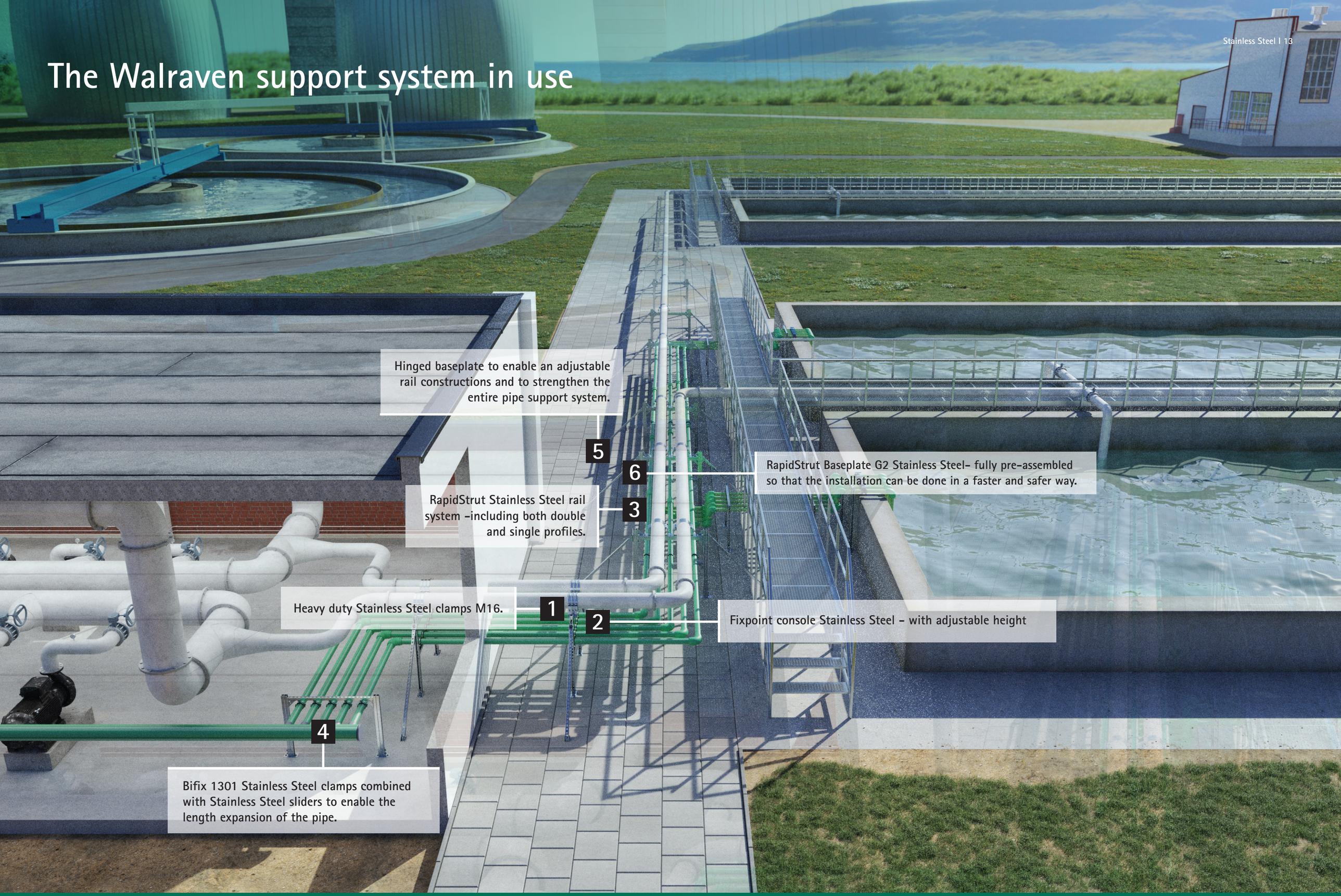
BIS Fasteners SSt

BIS SSt Roofing Sheet Hanger

Anchors SSt

This is a small selection of the complete range.
For more information look at walraven.com/en/stainless-steel

The Walraven support system in use



What is contact corrosion

and how to avoid it?

Due to complex design and sets of requirements, sometimes the combination of different types of metals is unavoidable. This is when contact corrosion, also known as galvanic corrosion may occur depending on the severity of corrosion in a given environment.

When contact corrosion occurs, the less noble material suffers from greater corrosion and acts electrochemically like an anode, while the more noble material acts like a cathode and suffers from less corrosion. Therefore, it is important to understand which materials can be used in combination in corrosive spaces and what the impact of the combination can be. In case you need assistance with deciding whether certain metals can be used in combination, please reach out to us.

A
Less noble metals

- Magnesium
- Zinc
- Aluminum
- Steel
- Lead

B
Noble metals

- Tin
- Bronze
- Chopper
- Brass
- Nickel
- Stainless Steel
- Silver
- Graphite
- Gold

Technical support and advice

At Walraven, the job does not end when you purchase our products. We pride ourselves on our invaluable after sales support and technical advice. Based on your individual requirements, our technical engineers can provide you with a comprehensive proposal including detailed load and wind calculations, technical drawings and component lists. All to make your life easier and your work on-site more efficient.

To contact our technical team directly, please send an email to: technical.uk@walraven.com

walraven

Find out how we can support you

Would you like to find out more about any of the solutions described in this brochure?
Or would you like to discuss how we could help you find the best possible solution for your project? Get in touch today!

Stainless steel (EN) - 09/2020 - pdf - Subject to modifications

United Kingdom
Ireland

Walraven Ltd.
Thorpe Way, Banbury (GB)
Oxon, OX16 4UU
Tel. +44 (0)1295 75 34 00
Fax +44 (0)1295 75 34 28
sales.uk@walraven.com

Walraven Group
Mijdrecht (NL) · Tienen (BE) · Bayreuth (DE) · Banbury (GB) · Malmö (SE) · Grenoble (FR) · Barcelona (ES) · Kraków (PL)
Mladá Boleslav (CZ) · Moscow (RU) · Kyiv (UA) · Detroit (US) · Shanghai (CN) · Dubai (AE) · Budapest (HU) · Mumbai (IN)
Singapore (SG)