



Activating Your Ideas

Stainless steel for pulp & paper processes

**OUTO
KUMPU**



Just around the corner

Outokumpu is one of the largest producers of stainless steel and is widely recognised as a world leader in technical support, research and development. We serve our customers from our main production facilities, supported by our extensive operations in some 30 countries around the world. Wherever in the world you may be, we are just around the corner.

We activate your ideas

It takes great talent to develop new products and processes for the pulp & paper industry. As a world leader in stainless steel, we fuel this talent by developing ever better stainless steels and solutions to meet the special demands of our customers, while working closely with them to ensure they always have the optimal solution. We help our customers achieve world-class innovativeness, quality and cost-efficiency.

Helping you make the right choices in a tough environment

Stainless steel is corrosion resistant, strong, hygienic and recyclable, making it an ideal choice for demanding pulp & paper industry applications. The process stages put different demands on the material, and we therefore recommend that material selection receives special attention - a task in which our experts would be glad to help you.

“We recently expanded our capacity in Piteå to meet growing demand for white paper board. Outokumpu’s proprietary LDX 2101® was chosen for the hydrogen peroxide reactor because the grade’s strength and low nickel content allowed for a cost reduction. I’m glad to note that together with Outokumpu we started a new era in this area.”

– Bo Johansson, Pulp Mill Manager,
Smurfit Kappa, Kraftliner Piteå, Sweden



Duplex steels for more than double the benefits

Duplex steel has been the biggest material breakthrough in the pulp & paper industry over the past 35 years, due to its excellent corrosion resistance, high mechanical strength and the thickness reductions this enables. Not surprisingly, duplex is increasingly chosen by our customers not just for the manufacture of pressurised vessels but also increasingly for main process equipment.

Not just the optimum grade, but also timely delivery

We have recognised the need to be close to our customers to ensure that the process of purchasing stainless steel is as simple as possible. We meet this need by a responsive supply chain and the provision of e-tools and advice to speed up the selection and ordering process, as well as through our service centres located in the main markets. The result is timely delivery.

Relationships that date back over 60 years, in the best woodland tradition

We have supplied the pulp & paper industry on every continent with materials, expertise and support required for the cost-efficient building of high-quality plants. This focus has led to long term partnerships (over 60 years in some cases) with many of the world’s leading suppliers to the papermaking business. Our aim is to be the undisputed leader in stainless steel.



Materials testing on your site

The introduction of closed systems and more demanding process environments are placing ever greater demands on the steels used in the pulp & paper industry. Because of this, we not only provide our customers with help and advice in choosing the best and most competitive material, but have also offered them the possibility to test candidate materials on their own premises.

Customer service where it counts

Thanks to our comprehensive sales and service centre network, we can provide you with timely local support where and when you need it. This includes studying all your needs on the spot, professional help in quality and production planning, as well as logistics advice – for optimal products, cost-efficient operations, and well-planned deliveries.

E-tools for product selection and more

In order to further streamline the ordering process, we are constantly developing easy-to-use online tools for your benefit. The tools allow you to search and select from our wide range of products, learn about their material properties, and also send us any questions and enquiries that you may have. The tools, of course, are available 24/7.

Special grades for varying corrosive environments

Corrosion is without doubt one of the key challenges faced by pulp & paper processes, and as a result we actively develop special grades to meet varying corrosive environments. This work is supported by extensive testing in our state-of-the-art laboratory. The tests are performed in either standard environments or in environments specially made for, or provided by our customers in order to find the best suitable stainless solution.



Taking care of your needs

Coming to terms with recirculating process water

The recirculation of process water in papermaking has been a welcome development from an environmental point of view, but has also led to increased concentrations of chlorides and polysulfides in process water and steam. As a result, we have refined our duplex grades over many years, and today offer a broad spectrum of grades to meet these and other challenges.

New grades open up a world of opportunities

We have an excellent track record in developing materials for demanding process applications for the pulp & paper and other industries. A good example of our technological leadership is LDX 2101[®], a low-nickel high-strength stainless steel with good corrosion resistance that compares to that of the standard austenitic grade 1.4307/304L. Our duplex grades are increasingly capturing market share in a range of applications.

Duplex steel – high on strength, low on costs

Today almost all pressure vessels used in the pulp & paper industry are manufactured of duplex materials. Furthermore, duplex is increasingly used in the fabrication of non-pressurised vessels, as well as main process equipment. Duplex combines low nickel content with high mechanical strength, which makes it an efficient and cost-stable alternative to more traditional stainless steel grades. Indeed, use of duplex can often be justified on cost alone due to the thickness reductions it enables.

Don't follow industry trends, start them with Outokumpu



Choice of materials and production technologies for the environment

We recognise that no product is without environmental impact. Because of this, we help our customers to choose the right materials, while also actively developing our own production technologies. Our Tornio Works stainless steel plant is the most integrated single-site operation in the world, and of our sites are ISO 14001 certified.

Support from Outokumpu R&D

We have always invested heavily in R&D. This covers everything from product and applications development to process development and improving the quality of production processes. Our R&D operations not only help us to develop ever better steel grades with leading cost-efficiency and environmental sustainability, but also play a key role in customer support.

Outokumpu's offering in a nutshell

Outokumpu's offering includes cold and hot rolled stainless steel coil, sheet and plate, which are available in a number of grades. We also make billet, wire rod and bar, as well as tubes, fittings and suction roll shells. We can also offer tailor made solutions for our customers.

The products are used in process industries, as well as the oil & gas, transportation, household, building and construction industries.

We also produce specialty stainless products, e.g. for the electronics and IT industries. In addition, we have the most up-to-date downstream processing centres in the main markets.



Tools for achieving competitive advantage

Each process stage sets its own special demands on the materials and therefore it is important that material selection receives special attention. We provide here some guidance as to which grades are recommended for the main stages of the papermaking process. For more specific information, we invite you to get in touch with an Outokumpu sales representative near you.

Tougher grades to counteract severe corrosion in cooking

Though 1.4307/304L or 1.4404/316L have been the standard choices, duplex steels like 2205, LDX 2101[®] and 2304 are increasingly used in digesters due to their greater corrosion resistance and thickness savings.

Less erosion and corrosion for blow tanks

Our duplex grades solve erosion and corrosion problems.

Meeting aggressive conditions in washing and screening

1.4307/304L, 1.4404/316L and especially duplex 2304, 2205 and LDX 2101[®] meet the tougher demands of closed systems.

Effective solutions for oxygen delignification

Today, duplex stainless steel is the most popular material for oxygen reactors.

High resistance in Cl₂ and ClO₂ bleaching

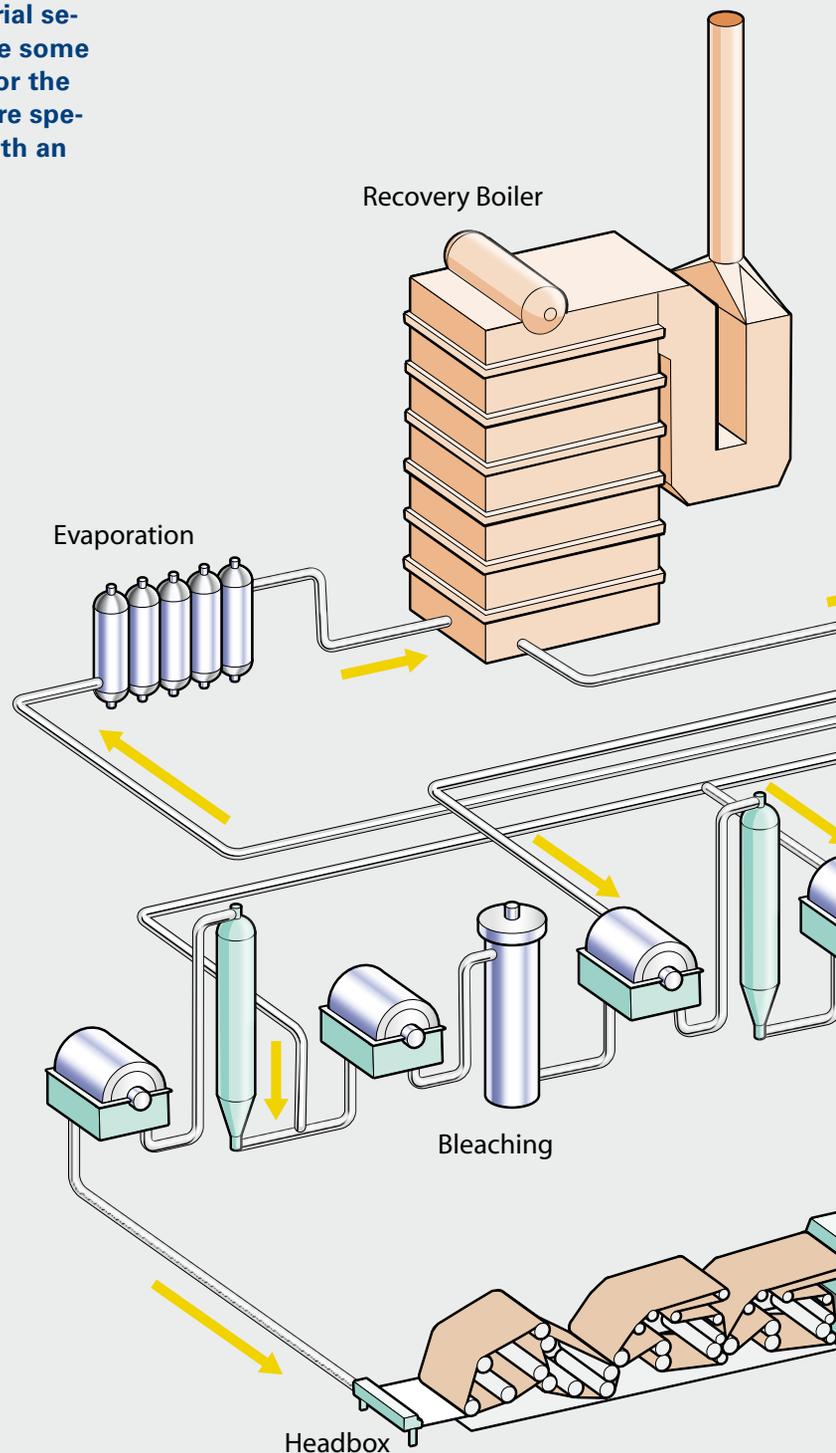
254 SMO[®] solves many problems, but duplex SAF 2507[®] offers greater strength and reduced cost. 2205 is an alternative for milder bleaching conditions.

Less highly alloyed materials for TCF bleaching

Hydrogen peroxide and ozone are relatively harmless to stainless steel even at fairly high concentrations and temperatures as long as the chloride content in the process water is kept at a low level.

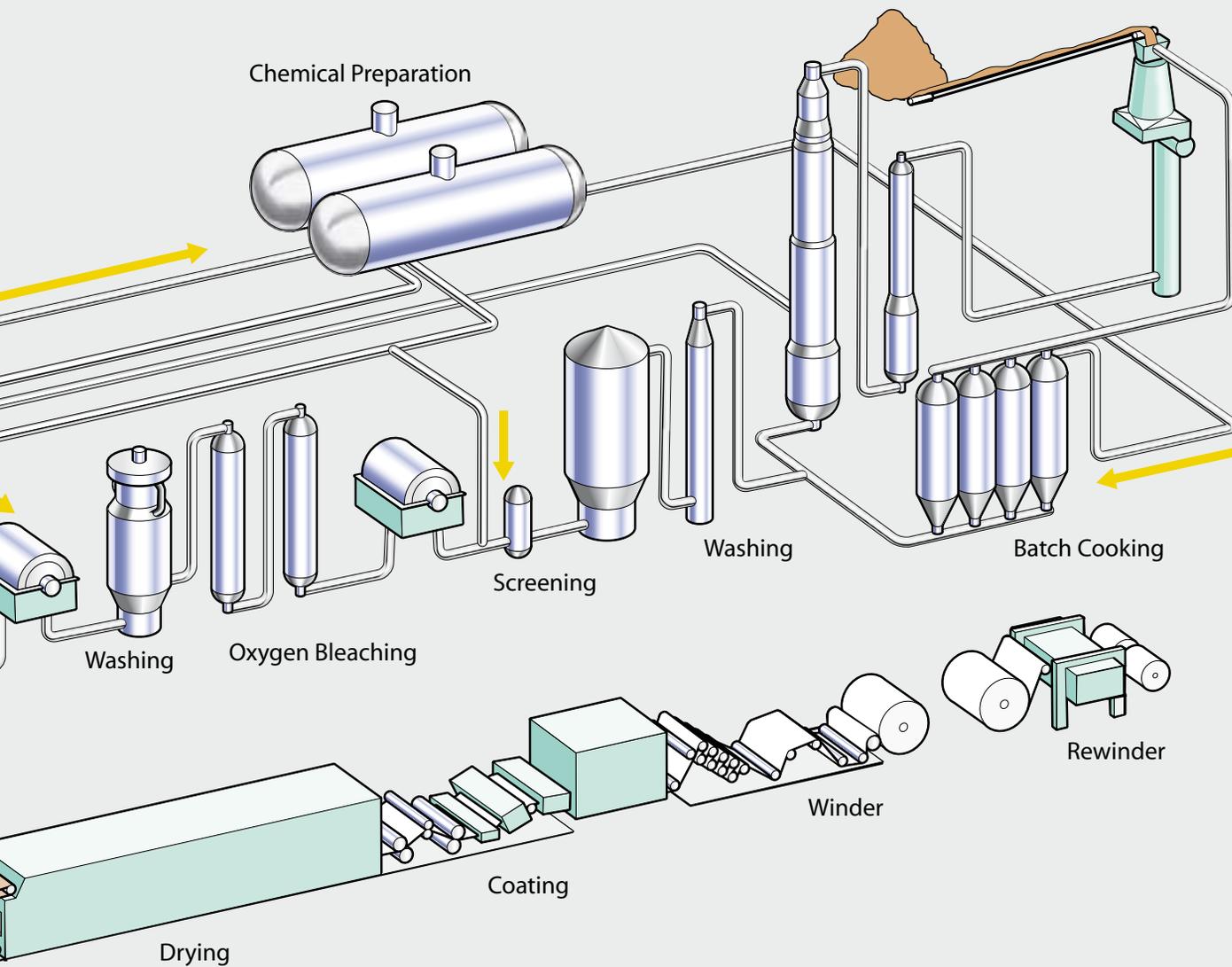
Reduced risk of pitting in pulp towers

Chlorides and the presence of residual chlorine require careful material selection. For example LDX 2101[®], 2304 and 2205, allow for significant thickness reductions.



Greater SCC resistance in chemical recovery evaporation

Higher temperatures and dry solid concentrations in the final evaporation stage make duplex steels preferable over austenitic steels, due to better resistance to uniform corrosion and stress corrosion cracking (SCC).



Meeting corrosion and maintenance demands in chemical recovery liquor tanks

Austenitic 1.4307/304L and 1.4404/316L have performed well in most applications, but duplex grades like LDX 2101[®], 2304 or 2205 are increasingly popular.

A broad range of options for paper machines

The requirements vary greatly for machine parts, for which we offer a number of options, e.g. 1.4404/316L PRODEC[®], LDX 2101[®], 2304, 2205. Also special suction roll grades.

Outokumpu – Activating Your Ideas

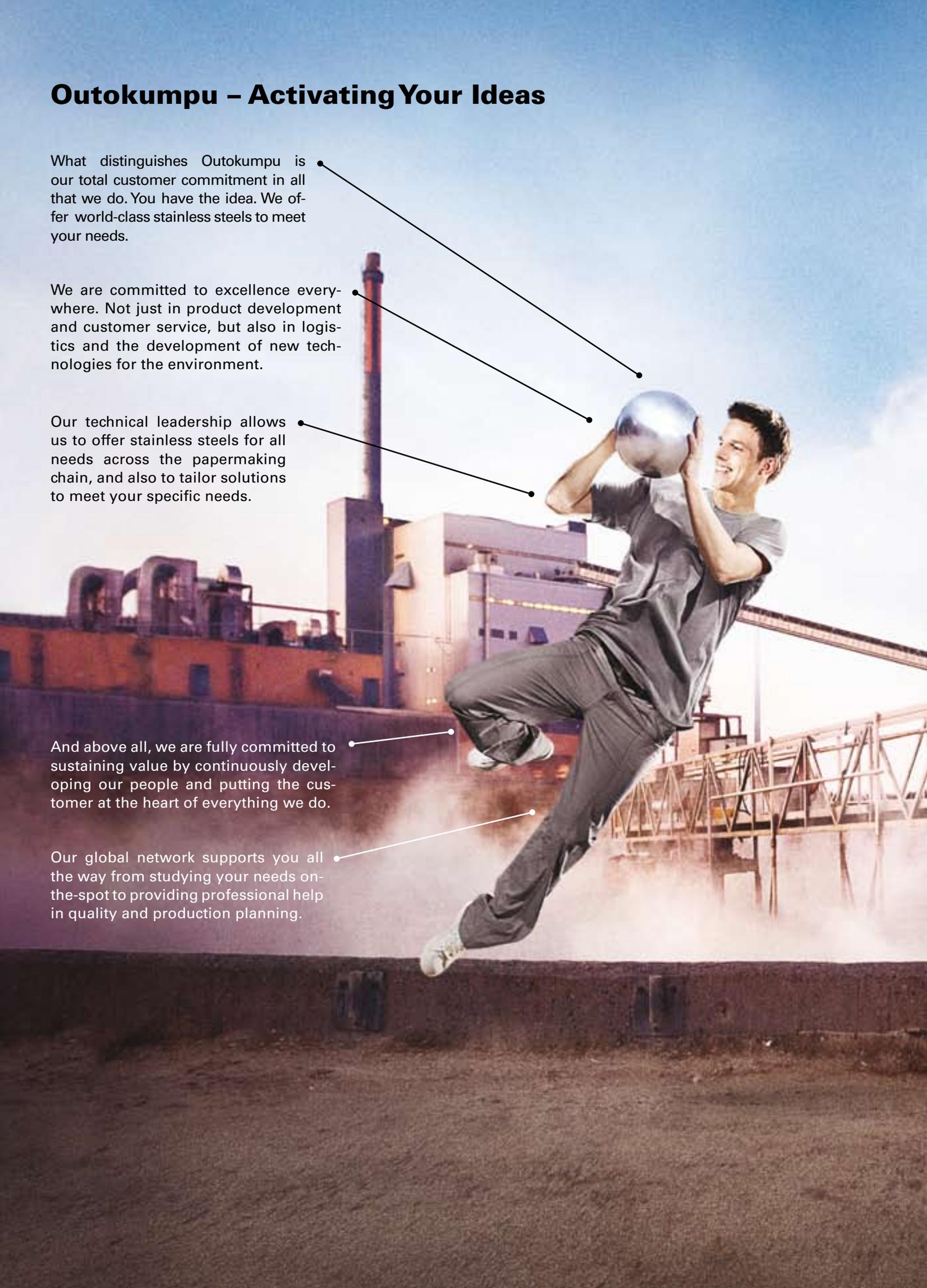
What distinguishes Outokumpu is our total customer commitment in all that we do. You have the idea. We offer world-class stainless steels to meet your needs.

We are committed to excellence everywhere. Not just in product development and customer service, but also in logistics and the development of new technologies for the environment.

Our technical leadership allows us to offer stainless steels for all needs across the papermaking chain, and also to tailor solutions to meet your specific needs.

And above all, we are fully committed to sustaining value by continuously developing our people and putting the customer at the heart of everything we do.

Our global network supports you all the way from studying your needs on-the-spot to providing professional help in quality and production planning.





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Outokumpu is a global leader in stainless steel. Our vision is to be the undisputed number one in stainless, with success based on operational excellence. Customers in a wide range of industries use our stainless steel and services worldwide. Being fully recyclable, maintenance-free, as well as very strong and durable material, stainless steel is one of the key building blocks for sustainable future.

What makes Outokumpu special is total customer focus – all the way from R&D to delivery. You have the idea. We offer world-class stainless steel, technical know-how and support. We activate your ideas.

