

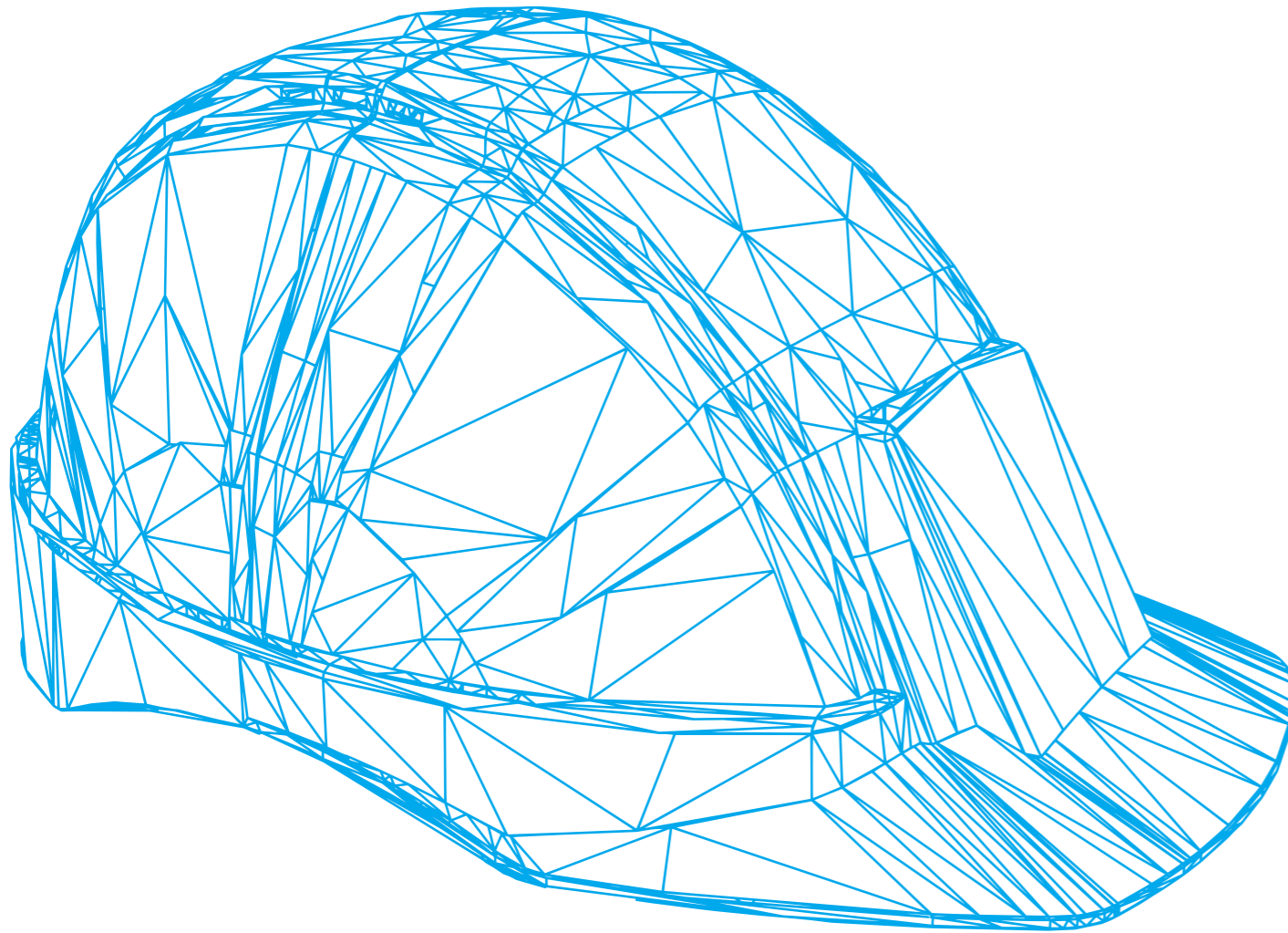
# SHUT DOWN CORROSION OPEN UP NEW POSSIBILITIES

HYDRAULIC AND INSTRUMENTATION TUBING FOR THE PETROCHEMICALS AND OIL & GAS INDUSTRIES



# PEACE OF MIND – THE PERFECT BALANCE BETWEEN SAFETY AND PERFORMANCE

Whether you're operating an oil rig or petrochemicals plant, the need to boost output without sacrificing safety is ever-present. In the big scheme of things, your choice of hydraulic and instrumentation tubing might not seem critical. But it does make a major difference in eliminating unnecessary risks. No unscheduled downtime. No leaks. Zero accidents. And immediate support if you need it. It's what we call The Sandvik Peace of Mind Standard.



ZERO ACCIDENTS  
IS THE VISION OF OUR  
"SAFETY FIRST" PROGRAM,  
WHICH ALSO EXTENDS  
TO OUR CUSTOMERS AND  
SUPPLIERS, FORMING AN  
INTEGRAL PART OF OUR  
EHS PROGRAM.

There's more than one reason why Sandvik tubing is used by leading multinationals for some of the world's most demanding upstream and downstream applications. For some, it's the ability to handle hotter, more sour wells under extreme pressures – in highly corrosive environments. For others, it's to ensure failsafe hydraulic control lines or subsea umbilicals for years to come. Because when it comes to the world's toughest jobs, only the most advanced and well-proven materials will deliver safe and reliable performance.

#### 50 YEARS OF SERVING THE INDUSTRY

For more than 50 years, we've been serving some of the most demanding customers in the global oil and gas industry. From the early days of subsea exploration to today's industry leading refineries and deep sea rigs, we've led the way in engineering the market's most comprehensive range of stainless steel and nickel alloy tubing. And backed it up with a global

service network that's always on call, and always close at hand. All so you can push the limits of performance, without putting your investments, or your people, on the line.

#### NO COMPROMISES ON SAFETY

In the end, striking the right balance all comes down to your ability to achieve your engineering designs in a responsible manner. Our aim is to provide petrochemical and oil and gas producers with the lightest, strongest, most reliable tubing to make it possible. No compromises. It's how we bring you peace of mind.



# TEMP 35°C. HUMIDITY 99%. CHLORIDE 30+ PPM

Hot sour wells. High humidity. Salt spray. As many of our oil and gas customers drill deeper into harsh environments, the need for reliable, leak-free, corrosion-resistant seamless tube is rising to the forefront. For years, we've provided hydraulic and instrumentation tubing that goes into the umbilicals, christmas trees and manifolds required to extract oil from the depths of the ocean under immense pressures. Not to mention top-side applications.

Experience has taught us that there's a big difference between barely meeting a standard and setting a "standard within the standard". When it comes to hydraulic and instrumentation tubing for oil and gas extraction, it's a difference that can mean millions to your bottom line. Any pitting, contamination or loss of containment can bring operations to a halt. And every moment spent waiting for replacements by barge is another missed opportunity.

**TAKING RISK OUT OF THE EQUATION**  
With stakes this high, and in conditions this unpredictable, your tubing should be one thing you can count on. And that's where we come in. With standard

or custom grade tubing that is widely appreciated worldwide for its cleanliness, corrosion resistance and superior dimensional tolerances.

**RIGHT MATERIAL AT THE RIGHT TIME**  
Whether your business is in exploration or production, on land or at sea, you can rely safely on our decades of experience in the most demanding oil, gas and petrochemical applications. More than just the right quality, right specifications and right timing, it's about applying leading materials technology that give your business a competitive edge in any environment.

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100% OF ALL MAJOR  
FABRICATORS AND  
OIL COMPANIES IN ALL  
OFFSHORE REGIONS ARE  
SANDVIK CUSTOMERS.



# THE LESS YOU THINK OF US, THE HAPPIER WE ARE

**Don't get us wrong, we love being top of mind. But when serving our production- and safety-conscious petrochemical customers we want to be remembered for all the right reasons. And when it comes to seamless stainless hydraulic and instrumentation tubing – once properly selected and fitted – that means being able to forget about us. Literally. Sandvik tubing just keeps working, day in and day out. No corrosion or pitting. No downtime. No worries.**

Serving forward-thinking petroleum engineers keeps us on our toes. Their ongoing drive to develop innovative refining solutions places increasing demands on new materials and more inspired engineering. We're also proud to collaborate closely with many of the world's leading engineering companies as well as original equipment manufacturers in tackling the future challenges of the industry.

#### FULLY INTEGRATED REFINERIES

Take, for example, the trend towards constructing mega-scale refineries alongside petrochemical

facilities in the Middle East and China. This desire to integrate facilities opens up new business opportunities as well as challenges. To better utilize all feedstocks at refineries, chemical crackers and derivative plants, there is often a greater need for safe and reliable premium quality hydraulic and instrumentation tubing. Unforeseen downtime is out of the question. Indeed, the engineering specifications are higher, but so are the business opportunities.

#### IN ALL REFINING HUBS

As one manager said: "Secondary or by-product streams from refining units may have their highest value as feedstock for chemical units. Likewise, by-products from chemical units may be most cost-effective as refinery feeds or fuel blending components." We see this integration happening in places like Singapore, the Gulf and elsewhere. But getting the most value out of such world-scale, fully integrated refining and petrochemicals hubs is something that places strong demands for top-quality materials.

#### LONG LIFETIME, SHORT MAINTENANCE

For more than half a century, Sandvik has been a world-leading developer of tube for oil refining, petrochemicals and gas processing. Whether you're distilling light crude, producing olefins or aromatics, you can count on us to provide tubular products made of top-quality corrosion-resistant alloys (CRA) that contribute to longer service life and reduced maintenance. We also provide duplex stainless steel and nickel alloys for sour crude oil. In short, a premium range tube that's so safe and reliable, you can practically forget about it.

SUPPORTING MORE PROFITABLE REFINING OF XYLENE, ETHYLENE, PROPLYLENE BUTADIENE, BENZENE, TOLUENE, VINYL, STYRENE AND METHANOL.

**\$791 BILLION –  
THE PROJECTED SIZE  
OF THE GLOBAL  
PETROCHEMICALS  
MARKET BY 2018.**

Source: AT Kearne

SINCE 1980, WE'VE SUPPLIED MORE THAN 100 MILLION METERS OF CONSISTENT, HIGH-QUALITY HYDRAULIC AND INSTRUMENTATION STAINLESS TUBING FOR DEMANDING CUSTOMERS IN THE OIL AND GAS, PETROCHEMICALS AND OTHER INDUSTRIES.



# PUT OUR 2,700 RESEARCHERS TO WORK ON YOUR TOUGHEST CHALLENGES

In a recent customer survey, we heard a common refrain: Our metallurgists are regarded as being "obsessed" with technical challenges. We take this as a huge compliment. With one of the largest R&D teams in the world, our mission is to apply our expertise to make our customers more productive and profitable. It's a quest that has led to many engineering firsts and more than 8,000 Sandvik Group patents, many of them relating to extreme uses of tube and wire as well as cutting and drilling tools.

With more than 50 years of experience serving the oil and gas and petrochemicals industries, we've built up a wealth of application knowledge. We love those visionary and extreme engineering challenges you've got up on your CAD drawing boards. Pioneering solutions that might allow you to go to remote locations and drill in deeper, hotter and more corrosive environments. Or technical innovations that could breathe new life into an older refinery.

## 100 MILLION METERS OF UMBILICALS

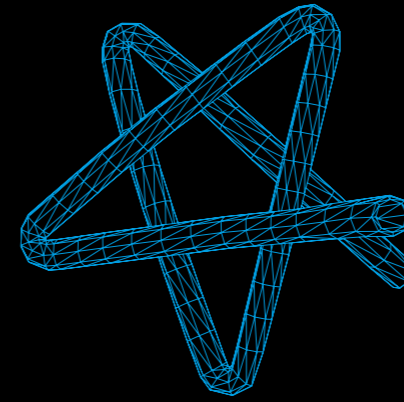
How do we know? For starters, we've been heavily involved as a tube supplier to umbilical manufacturers since they came into use in the late 1980s, having supplied more than 100 million meters (330 million feet) worldwide to date. And we've long been in the forefront of duplex steels, an area where we continue to excel and push limits.



Our lightweight corrosion-resistant tubing for subsea umbilicals is used by 70% of major oil companies for the extraction of oil and gas in harsh offshore conditions at depths of up to two kilometers.

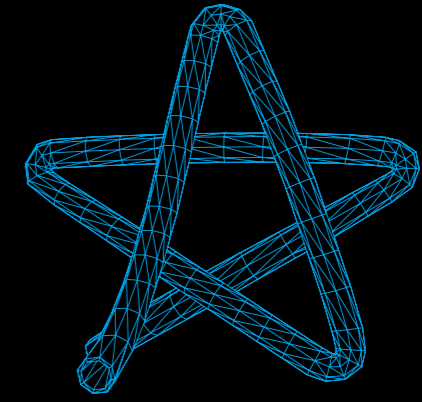
# A SIX-STAR APPROACH TO MAKING YOU AND YOUR CUSTOMERS MORE SUCCESSFUL

What do you look for in a producer of seamless tubing? Premium grades that meet ASTM and EN standards? A comprehensive stock range? Stock availability to ensure on-time deliveries? Whatever your specific needs, you demand five-star service. But let's face it, there are standards and there are standards. Good may not be good enough. That is why we at Sandvik are adding a sixth star to set an even higher standard. We call it the Sandvik Peace of Mind Standard.



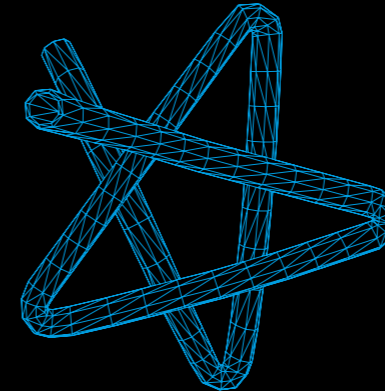
## 1. BROADEST RANGE

We offer more choices and greater flexibility to find the "right" solution by providing the world's broadest in-stock range of seamless stainless hydraulic and instrumentation tubing in the outer diameters of 1.59 to 50 mm (larger diameters available upon request).



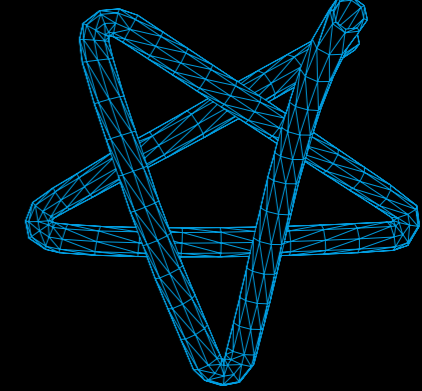
## 2. GLOBAL PRODUCTION & STOCKS

To ensure 24/7 availability, we operate three dedicated mills for hydraulic and instrumentation tubing on three continents and several comprehensive local stock warehouses on all continents.



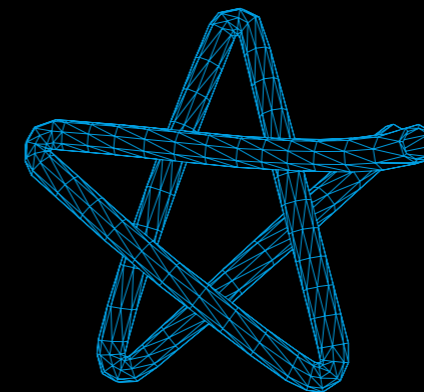
## 3. CONSISTENT QUALITY

When it comes to quality standards like corrosion resistance, dimensional tolerance, and hardness control, we set a higher standard within the standard – with all batches traceable back to the original melt at our plant in Sweden.



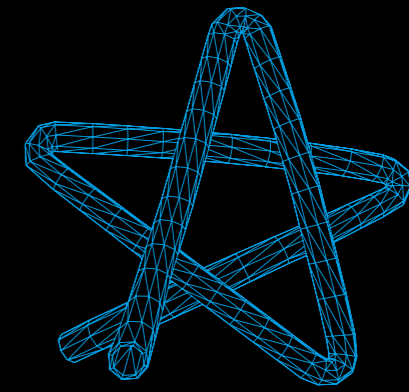
## 4. R&D EXPERTISE

With some 2,700 researchers pushing the boundaries of advanced materials, we are constantly pioneering forward-thinking solutions. Should a situation arise, we can provide local support at your facility.



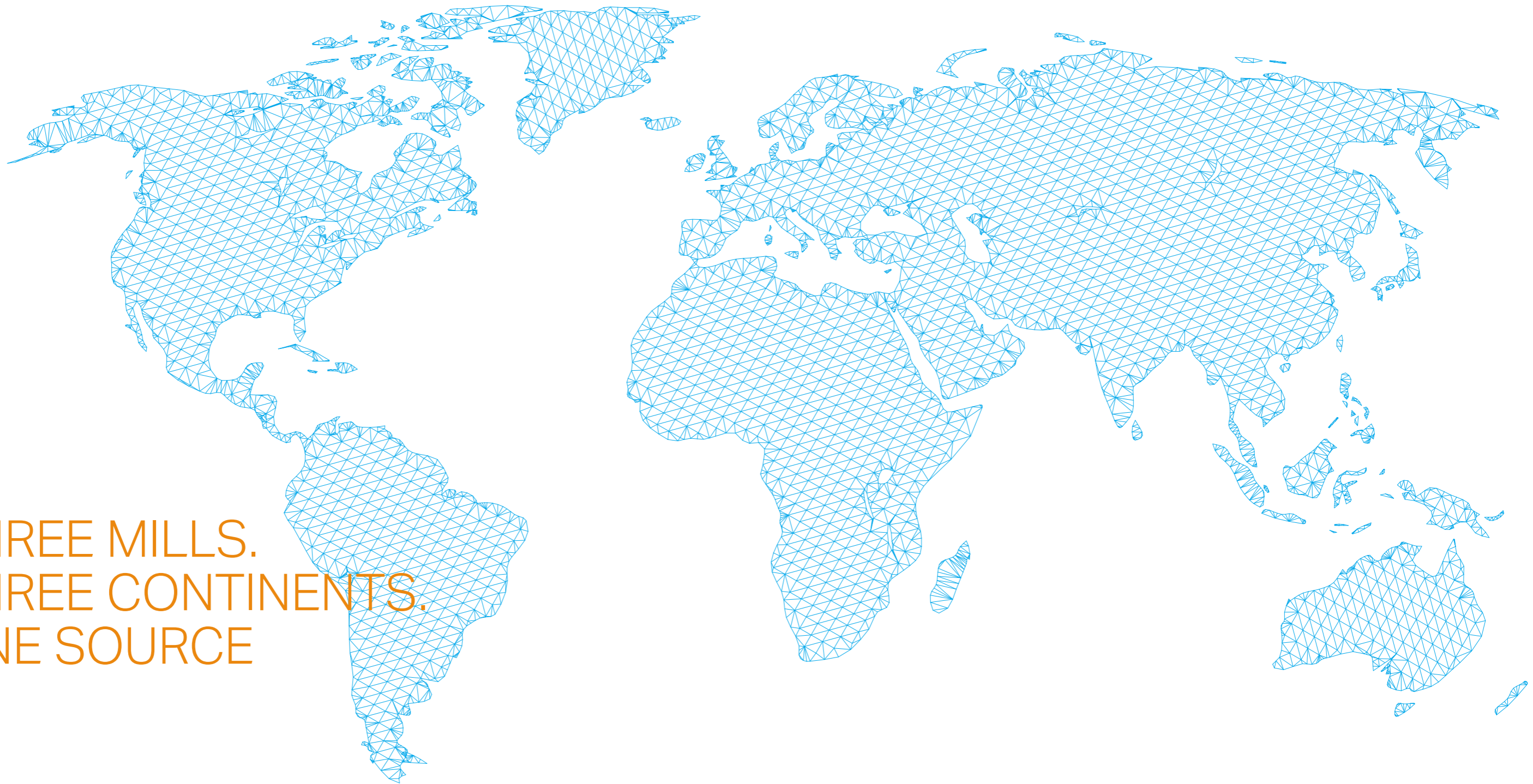
## 5. 150 YEAR HERITAGE

Having produced steel products for more than 150 years and seamless stainless steel tubes for 90 years, you can trust that we have the depth of expertise to support you.



## 6. SAFE ENVIRONMENT

We place very high requirements on safety routines within all aspects of our company and work with ongoing CSR and EHS programs.



# THREE MILLS. THREE CONTINENTS. ONE SOURCE

Are you absolutely certain that the quality of your hydraulic and instrumentation tubing is consistent from batch to batch? Day in and day out? Or do you find yourself constantly performing Positive Material Identification (PMI) tests on supplier deliveries to control that you've got the right grade and quality?

## DEMANDING TIME SCHEDULES

As a global supplier to leading petrochemical, engineering and service companies, we are fully aware of the pressures you face. What used to be a 24-month build is now an 18-month race to the finish line. In such situations, a delay with your tubing can put everything

else behind schedule. Once you're up and running, unscheduled maintenance is simply not an option. In short, the new challenges demand trusted suppliers with a proven track record of delivering on time.

## ULTRAMODERN SHIPPING FACILITIES

So you'll be glad to know that Sandvik is the only stainless tube producer in the world to operate dedicated hydraulic and instrumentation mills on three continents. Alongside these mills and spread across major industrial hubs, we also have tons of comprehensive tube stock at our warehouses. Ultramodern shipping facilities allow for fast, efficient service.

As a result, we've gained a reputation for having the world's broadest in-stock range of corrosion-resistant stainless steel tubing with outside diameters from (OD) 1.59 to 50 mm (0.0625 to 1.968 in.).

## WIDEST RANGE WORLDWIDE

This means you can choose from literally hundreds of thousands of meters of different grades and wall thicknesses (straight length or coiled). You can also rest a little easier knowing that you are getting the right product at the right time. It's our way of offering petrochemical and oil and gas customers a bit more peace of mind.

TAKE ADVANTAGE OF  
OUR MATERIALS EXPERTS  
IN 130 COUNTRIES,  
INCLUDING HUBS IN  
STAVANGER, HOUSTON,  
SÃO PAULO, DUBAI AND  
SINGAPORE.

# IT'S TIME TO CORROSION-PROOF YOUR BUSINESS

When humidity starts to exceed 75% and temperatures are warm, the risk of corrosion increases exponentially. Add to this salt water in a tropical environment and you'll notice that poor quality seamless tubing will rapidly start to pit or corrode. There can also be big differences – within the standard – for tubing, as tests with major oil companies and fitters show.

Whether it's topside, downhole or in another challenging environment, hydraulic and instrumentation tubing tends to pit and corrode when placed in inaccessible locations containing chlorides. Tube material that would normally last 100 years or more in dry conditions could have a service life of five years or less in an aggressive chloride-rich environment.

## TESTS BY LEADING MULTINATIONALS

"Says who?" you ask. Well, this was the conclusion of two of the world's largest oil companies and one major fitter after conducting a joint field trial in tropical waters. Our own lab results concurred. Most of the pitting and crevice corrosion occurred beneath clamps, support trays and connections.

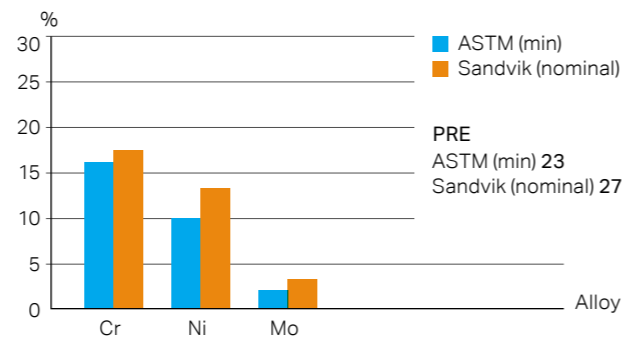
## 2.6% MOLYBDENUM VS 2.0% REQUIRED BY ASTM

The study also showed a big difference in the pitting resistance of the Sandvik 3R60 versus the minimum requirements for the international standard ASTM 316L (see Diagram 1). Sandvik was always at the top of the standard, with high percentages of nickel, chrome and molybdenum to combat corrosion. For example, we had a minimum of 2.6% moly vs. the 2.0% minimum required by ASTM. Pitting Resistance Equivalent (PRE) is calculated from the level of Cr, Mo, and N present in an alloy ( $PRE = 1 \times \%Cr + 3.3 \times \%Mo + 16 \times \%N$ ).

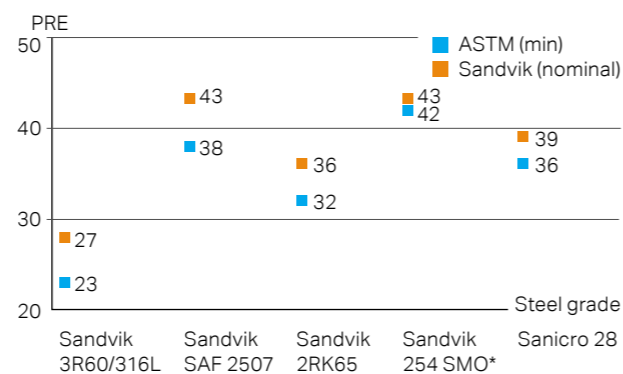
## CORROSION-RESISTANT DUPLEX TUBES

While Sandvik 3R60 is a reliable all-round material choice, we recommend the Sandvik SAF 2507™ super duplex for more corrosive chloride-bearing environments where weight reduction is desirable. And of course, there are even more corrosion-resistant grades too. In all cases, Sandvik grades performed at the top of the standard compared with the ASTM minimum value (see Diagram 2).

1. KEY ALLOY CONTENT SANDVIK 3R60 VS ASTM 316/316L  
PRE value of Sandvik and ASTM (min)



2. PRE VALUES FOR SANDVIK GRADES VS ASTM (MIN)

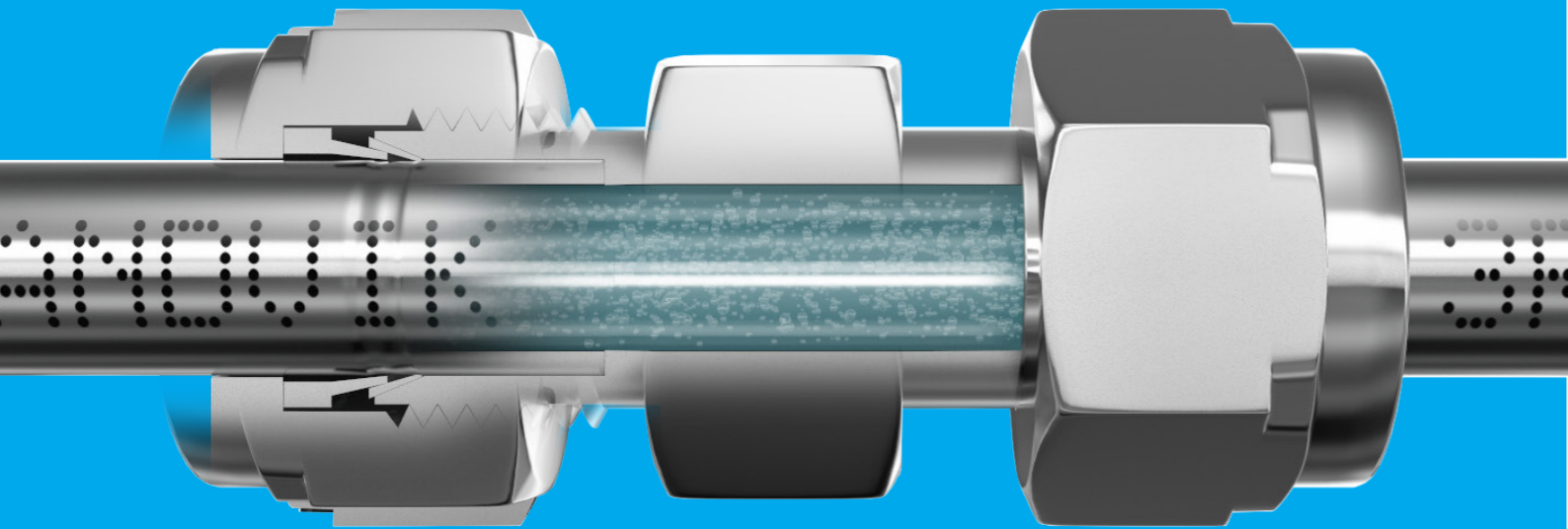


\*254 SMO is a trademark owned by Outokumpu OY.

- ### CORROSION RESISTANCE BENEFITS
- ZERO CUSTOMER COMPLAINTS OR RECALLS
  - ACCESS TO OUR CORROSION EXPERTISE
  - WELL-DOCUMENTED HIGH PERFORMANCE
  - RESISTANT TO PITTING AND CREVICE CORROSION
  - STABLE LEVEL OF CONSISTENT, HIGH-QUALITY STOCK



# WE HAVE ZERO TOLERANCE FOR LEAKS



## DIMENSIONAL TOLERANCE BENEFITS

- ZERO CUSTOMER COMPLAINTS OR RECALLS
- LEAK-FREE FITTINGS OR COUPLINGS
- RECOMMENDED BY LEADING CONNECTOR COMPANIES
- PROVEN PERFORMANCE TO MOST MULTINATIONALS
- CONSISTENT STOCK AVAILABILITY; 24/7 DELIVERY

Unscheduled downtime due to a hydraulic line that needs repairing can be a major inconvenience and cost. Even worse, the loss of hydraulic fluids or chemicals could lead to a valve shutdown or a loss of instrumentation control. So ask yourself: Is your tube supplier giving tight enough dimensional tolerances to ensure leak-tight seals? Do you get even consistency from batch to batch?

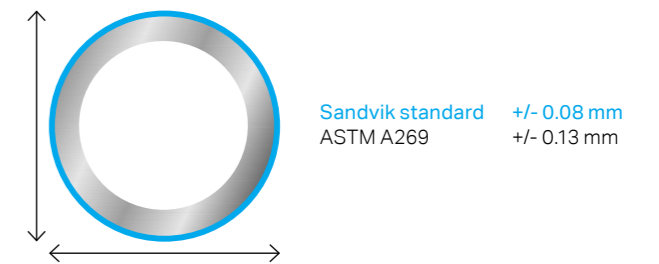
The reason for mentioning this is that our laboratory tests – together with some of the world's leading connector and fitting manufacturers – show significant differences in the standards applied for dimensional tolerance. Unfortunately, such deviations can increase the risk of leaks, depending on the pressure, flow and medium used.

### BEATING THE ALLOWABLE VARIANCE

Take, for example, ASTM A269 tube, which has an outer diameter dimensional tolerance of  $\pm 0.13$  mm. By contrast, the allowable variance for the comparable Sandvik tube is just  $\pm 0.08$  – a major difference (see Figure 1). This means that when evaluating ASTM A269, the variance is a full 0.26 mm, compared to just 0.16 mm for the equivalent Sandvik tube.

### NEARLY TWICE AS TIGHT TOLERANCE

In other words, Sandvik is often providing tubing that has nearly twice as tight tolerance as the minimum accepted by the ASTM standard. And tighter tolerance is key to getting a leak-proof joint between the connector and tube – letting you compress the ferrule in the connector onto the tube to create a vacuum-



**1. KEY ALLOY CONTENT SANDVIK 3R60 VS ASTM 316/316L**  
The outer diameter tolerance of Sandvik hydraulic and instrumentation tubing is tighter than ASTM standard.

tight seal as it moves down the cone of the body. If the tube is too hard or has an uneven wall thickness, it's going to be difficult to get a strong mechanical hold on the ferrules, increasing the chance of leakage.

### CONSISTENCY IS THE KEY

The secret to the Sandvik tubing is that the tight tolerances are maintained from batch to batch, meter after meter, year in and year out. In fact, our three dedicated mills have the capacity to produce millions of meters of hydraulic and instrumentation tubing annually with OD tolerance of  $\pm 0.08$  on all tubes with OD of 6 to 30,0 mm. So it's little wonder that the world's leading manufacturers of fittings and connectors recommend us.

# ALL BENDS, NO BREAKS

## HARDNESS CONTROL BENEFITS

- AVOID WALL COLLAPSES AND BREAKS
- EASY, RELIABLE BENDING
- CONSISTENT QUALITY FOR AUTOMATED BENDING
- NO LEAKAGE



Can you afford to have wall collapses and cracks in the hydraulic or instrumentation tubing in your system? Is the tubing you are currently using giving you controlled hardness for easy bending and leak-free connections? Beware: There are many definitions of what is a good standard. Fortunately, our tube is at the top of the standard on all counts.

The good news is that Sandvik tubing is optimized for hardness that allows easy, reliable bending and consistent quality – with no wall collapse or cracks. This is important whether you are using a hand-held bender, an automated bender or simply a spanner. By knowing you are getting a consistent hardness – not too stiff, not too pliable – you can work quickly and with confidence.

### TIGHT RADIUS BENDS

For example, you can always make just the right number of turns with the spanner or ensure the right setting for a hand-held or heavy-duty tube bender. The right hardness allows for accurate, tight radius bends of up to 180 degrees without the walls collapsing. Different hardness in the same tube batch can lead to difficulties when tightening the tube fitting.

### HRB 80 – PIONEERED BY SANDVIK FOR ASTM 316L

So what is an acceptable standard for hardness? As shown in Table 1, the maximum requirement for an ASTM 316L tube is a hardness level of HRB 90.

Here, Sandvik was the first to achieve an HRB 80 (low numbers are better). This means we provide a tube that's strong, yet a bit softer than the standard, making it easier to grip and bend. We are also able to supply a hardness of "30 HCR" with our Sandvik SAF 2507™ super duplex tubes.

### OPENING NEW OPPORTUNITIES

Our aim is to apply our metallurgical knowledge to offer you controlled hardness that sets a standard of its own for easy bending and leak-free connections. Just the right hardness is enabled by Sandvik's unique combination of technology, equipment and know-how within the pickling, drawing and heat-treating processes, which makes the material strong, yet pliable. In all cases, Sandvik tube grades performed at the optimum level of the standard compared with the ASTM maximum hardness values.

1. SEAMLESS STAINLESS TUBE HARDNESS COMPARISON

ASTM grade	Sandvik grade	ASTM	Sandvik
ASTM 316L	Sandvik 3R60	max HRB 90	max HRB 80
UNS S32750	Sandvik SAF 2507	max HRC 32	max HRC 30



# NINE STEPS TOWARDS A CLEAN CONSCIENCE

## CLEANLINESS BENEFITS

- NO COMPLAINTS ABOUT DIRTY TUBES
- CUSTOMERS AVOID COSTLY SHUTDOWNS
- INTERIOR FREE OF SCALE AND CONTAMINATION
- REDUCED RISK OF SYSTEM FAILURE OR UNPLANNED MAINTENANCE
- PROTECTS AGAINST MALFUNCTIONING PUMPS, FILTERS, VALVES AND ACTUATORS

**Our conscience, that is. We can't have any peace of mind until we're sure that you're getting ultra-clean hydraulic and instrumentation tubing. After all, when you've spent in excess of \$500 million on a refinery or oil platform, you should not risk having contaminated hydraulic fluids in a pump – a situation that could lead to unscheduled maintenance or production stops costing millions.**

## NO TIME FOR CLEANING AT REMOTE SITES

So what cleaning method does your current supplier use? Do they plug their tubes? Have you ever noticed dirt? The fact is that small impurities in your tube can cause problems in other parts of your system. And nobody has time to clean shipments of tube that are arriving, especially on remote sites like offshore oil platforms.

## CLEAN TUBES, TROUBLE-FREE SYSTEMS

To prevent unplanned malfunctions due to impurities, Sandvik uses a nine-step cleaning process. This means that before shipping, all Sandvik hydraulic and instrumentation tubes routinely undergo a rigorous, proprietary cleansing process to ensure the highest degree of cleanliness. It's just another way we offer our customers complete peace of mind.

### 1. EXTERIOR ALKALINE BATH

The outer tube surface receives an alkaline bath to clean and passivate it.

### 2. REMOVAL OF IMPURITIES

Under high pressure, oil and other impurities are flushed from inside the tube.

### 3. INTERIOR ALKALINE BATH

The interior of the tube is given an alkaline bath to clean and passivate it.

### 4. INTERIOR WATER CLEANING

Water is flushed through the interior to further clean it.

### 5. INTERIOR AIR DRYING

High-pressure air is blown through the interior to clean out any impurities.

### 6. BRIGHT ANNEALING

All sizes with an OD up to and including 25.4 mm are supplied bright annealed.

### 7. POLISHING

To provide a bright, smooth finish, all tube is carefully polished.

### 8. INTERIOR CLEANING

Air and foam plugs are blown through the tube to remove any impurities or particles.

### 9. PROTECTION PLUGS

All tubes with outer diameters larger than 6 mm are supplied with plugged ends.



## STEEL GRADES

Grade	STANDARDS		CHEMICAL COMPOSITION (nominal), %					PRE (nominal)	MECHANICAL PROPERTIES		
	ASTM TP UNS	EN steel no.	C	Cr	Ni	Mo	Others		Proof strength R <sub>p0.2</sub> MPa min.	Tensile strength R <sub>m</sub> MPa	Elong. A %
Sandvik 3R60™	316/316L	1.4435	≤0.030	17.5	13	2.6	-	27	220	515	45
Sandvik 5R75	316Ti	1.4571	0.05	17	12	2.1	Ti	24	220	510	45
Sandvik 2RK65™	N08904	1.4539	≤0.020	20	25	4.5	Cu	36	230	520	35
Sanicro™ 28	N08028	1.4563	≤0.020	27	31	3.5	Cu	39	220	550	40
Sanicro™ 60	N06625	2.4856	≤0.025	21.5	60	8.3	-	48	276	690	30
Sandvik 254 SMO™	S31254	1.4547	≤0.020	20	18	6.1	N,Cu	43	310	655	35
Sandvik SAF 2507™	S32750	1.4410	≤0.030	25	7	4	N	43	550	800	25

\* 254 SMO is a trademark owned by Outokumpu OY.

## TOLERANCE

### METRIC/IMPERIAL SIZES

#### SANDVIK 3R60™ OD <6 mm, TOLERANCES ACCORDING TO ASTM A632

Size OD, mm	Tolerances OD, mm	Wall thickness %
<2.38	+0.05/-0	+/-10
<4.77-2.38	+0.08/-0	+/-10
<6-4.77	+0.10/-0	+/-10

#### SANDVIK 3R60™, SANDVIK 5R75, SANDVIK 254SMO™, SANDVIK 2RK65™, SANICRO™ 60, SANICRO™ 28, OD 6-50 MM EN 10305-1

Size OD, mm	Tolerances OD, mm	Wall thickness %
6-30	+/-0.08	+/-10
32-40	+/-0.15	+/-10
42	+/-0.20	+/-10

#### SANDVIK SAF 2507™

Size OD, mm	Tolerances OD, mm	Wall thickness %
≤19,05	+/- 0,13	10%

### FIXED LENGTHS

6000 -0/+5 mm

### STRAIGHTNESS

Maximum deviation from a straight line = 1,5 mm/1000mm.

### OVALITY

Ovality is calculated as OD<sub>MAX</sub> - OD<sub>MIN</sub>  
Max allowed is 0.005", (0.127 mm) for OD < 30 mm.  
For OD > 30 mm, max allowed is same as OD tolerances  
according to EN 10305-1

## STANDARDS

### Sandvik 3R60™

ASME/ASTM SA/A-213 AW  
ASTM A-269  
ASTM A-1016  
EN 10216-5 TC-1  
ISO EN 3651-2 A  
EN 10305-1 (Only Tolerances  
- Table 5)  
PED /2014/68/EU

### Sandvik 5R75

ASTM A-1016  
EN 10216-5 TC-1  
ISO EN 3651-2 A  
EN 10305-1 (Only Tolerances  
- Table 5)  
PED /2014/68/EU

### Sandvik 254 SMO™

ASME/ASTM SA/A-213 AW  
ASTM A 269  
ASTM A-1016  
EN 10216-5 TC-1  
EN 10305-1 (Only Tolerances  
- Table 5)  
PED /2014/68/EU  
NORSOK M630, MDS R18

### Sandvik 2RK65™

ASTM A-213/A-269  
ASTM A-1016/A-999  
EN 10216-5 TC-1  
ISO EN 3651-2 C  
EN 10305-1 (Only Tolerances  
- Table 5)  
PED /2014/68/EU  
NACE MR 0175/ISO 15156

### Sanicro 28

ASTM B668  
ASTM B829  
EN 10216-5 TC-1  
EN 10305-1 (Only Tolerances  
- Table 5)  
PED /2014/68/EU  
NACE MR 0175/ISO 15156

### Sandvik SAF 2507™

ASTM A-789  
ASTM A-1016  
EN 10216-5 TC-1  
PED /2014/68/EU  
NORSOK M630, MDS D58  
NACE MR 0175/ISO 15156

### Sandvik Sanicro™ 60

ASME/ASTM SB/B 444  
ASTM B-829  
PED /2014/68/EU  
Grade 2

## COILED TUBING – STANDARD SIZE RANGE

### IMPERIAL SIZES

Size, inch		Single coil length *, ft
1/8	x .020	1,300
	x .028	1,300
	x .035	1,300
	x .049	1,300
3/16	x .020	1,000
	x .028	950
	x .035	750
	x .049	600
1/4	x .035	2,005
	x .049	1,528
	x .065	1,256
3/8	x .035	1,267
	x .049	941
	x .065	749
	x .083	612
1/2	x .035	927
	x .049	681
	x .065	534
5/8	x .035	446
	x .049	325
	x .065	253
3/4	x .035	367
	x .049	266
	x .065	207

\* Minimum guaranteed length for TP 316/316L.

### METRIC SIZES

Size, mm		Single coil length *, m
3.0	x 0.5	400
	x 0.75	400
	x 1.0	400
3.5	x 0.5	400
	x 0.75	400
	x 1.0	350
4.0	x 0.5	350
	x 0.75	350
	x 1.0	300
6.0	x 1.0	594
	x 1.2	515
	x 1.5	440
8.0	x 1.0	424
	x 1.2	364
10.0	x 1.0	330
	x 1.2	281
	x 1.5	233
12.0	x 1.0	270
	x 1.2	229
	x 1.5	188
	x 2.0	146

Sizes above 12 mm – please inquire.

## STEEL GRADES

Grade	ASTM	UNS	EN, steel no.
Sandvik 3R12	304/	S30400/	1.4306/
	304L	S30403	1.4301
Sandvik 3R60™	316/	S31600/	1.4435
	316L	S31603	
Sandvik 3R65	316/	S31600/	1.4404
	316L	S31603	
Sandvik 6R35	321/	S32100/	1.4541/
	321H	S32109	1.4940
Sandvik 5R75	316Ti	S31635	1.4571
Sandvik 8R40	347/	S34700/	1.4550/
	347H	S34709	1.4912
Sandvik SAF 2205™		S31803/	1.4462
		S32205	17,162
Sandvik SAF 2304™		S32304	1.4362
Sandvik SAF 2507™		S32750	1.4410
Sandvik 2RK65™		N08904	1.4539
Sanicro™ 28		N08028	1.4563
Sanicro 30	Alloy 800	N08800	1.4558
Sanicro 41	Alloy 825	N08825	
		N04400	
Sanicro 70	Alloy 600	N06600	
		N02200	

## STANDARDS

ASTM: A213, A269, B163, B167, B668, A632, A789, A790

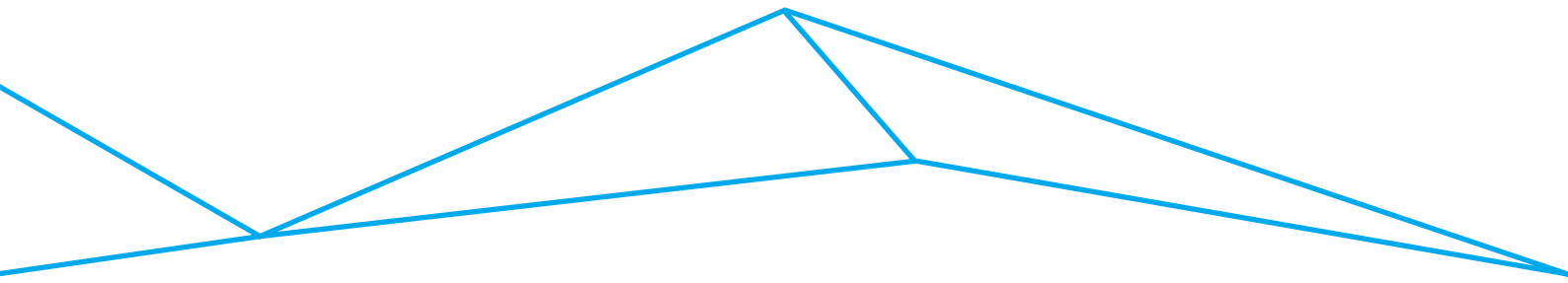
ASME: SA213, SB163, SB167, SB 668, SA789, SA790

NACE: MR 0175

EN: 10216-5 TC1

Eddy Current or hydrostatic test at option of Sandvik.





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