

Setting a standard within the standard

Hydraulic and instrumentation tubing

Over 160 years of quality and expertise

Founded in 1862 in Sandviken, Sweden, we've long partnered with customers to deliver high-performance steel and alloys that boost productivity, safety, and sustainability. Our materials withstand harsh conditions – resisting corrosion, including pitting and stress corrosion cracking – to extend equipment life and reduce downtime. Our hydraulic and instrumentation tubing range continues to evolve with new grades, service concepts and coiled solutions.

Innovating together with demanding industries

From the first duplex and super-duplex grades to novel alloys like Sanicro® 35, we've pioneered advanced materials – many now available as instrumentation tubing. Backed by a 300-strong R&D team and more than 900 developed alloys, we serve demanding sectors including oil & gas, nuclear, aerospace, automotive, chemicals and petrochemicals. Our goal is always to help you operate more efficiently, profitably and safely.

Imperial sizes overview – hydraulic and instrumentation tubing

Grade	OD min.	OD max.	WT min.	WT max.
316/316L	1/16"	1 1/2"	0.014"	0.095"
304/304L	1/4"	1 1/2"	0.028"	0.095"
Alleima® 3R60 (316/L 2.5% Min. Moly)	1/16"	1 1/2"	0.014"	0.095"
317L	1/4"	1 1/2"	0.035"	0.095"
Sanicro® 41 (Alloy 825)	1/8"	1 1/2"	0.028"	0.095"
SAF™ 2507	1/4"	1 1/2"	0.035"	0.095"
Alleima® 254 SMO*	1/4"	1 1/2"	0.035"	0.095"

* 254 SMO is a trademark owned by Outokumpu OY.



Made in the USA Tubular Solutions

Since 1972, Alleima's tube mill in Scranton, Pennsylvania has served as a central manufacturing site for high-quality stainless steel and specialty alloy tubes and pipes. Our hydraulic and instrumentation tubing is available in both coils and straight lengths. Thanks to our U.S.-based production, lead times are typically half that of imported products.

Our 6-Star Peace of Mind Standard

Many hydraulic and instrumentation tubes look alike. But a close inspection reveals that some barely meet ASTM standards. Our Six-Star Approach guarantees you get superior corrosion resistance, hardness, ovality and more. It's how we set a standard within the standard.

We have zero tolerance for leaks

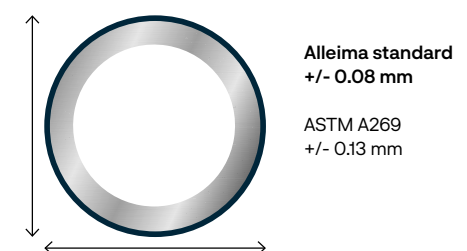


Figure 1. Key alloy content Alleima® 3R60 vs ASTM 316/316L

The outer diameter tolerance of Alleima hydraulic and instrumentation tubing is tighter than ASTM standard.

Beating allowable variances

ASTM A269 tube permits an outer diameter dimensional tolerance of +/- 0.13 mm. By contrast, the equivalent Alleima tube allows just +/- 0.08 – a significant difference (see Figure 1). This means the total possible variation for ASTM A269 is 0.26 mm, versus only 0.16 mm for Alleima, offering greater precision and consistency.

Hydraulic and instrumentation tube materials

Alleima trademark	UNS	C	Si	Cr	Ni	Mo	PREN**	Standards
Alleima® 3R12 (304/L)	S30403 / S30400	≤0.030	0.5	18.5	10	-	18	ASTM A213, A269, A312; EN 10216-5
Alleima® 3R65 (316/L)	S31603 / S31600	≤0.030	0.4	17	11.5	2.1	24	ASTM A213, A269
Alleima® 3R60 (316/L 2.5% Min. Moly)	S31603 / S31600	≤0.030	0.5	17.5	12.5	≥2.5	26	ASTM A213, A269, A312; EN 10216-5
Alleima® 3R64 (317L)	S31703	≤0.030	0.5	18.5	13.5	3.5	29	ASTM A213, A269, A312; EN 10216-5
Alleima® 2RK65 (904L)	N08904	≤0.020	≤0.70	20	25	4.5	35	ASTM 904L
Alleima® 254 SMO*	S31254	≤0.020	≤0.80	20	18	6.1	43	ASTM A213, A269, A312; EN 10216-5
SAF™ 2507	S32750	≤0.030		25	7	4	43	ASTM A789; A790
Sanicro® 41 (Alloy 825)	N08825	≤0.030	≤0.5	20	38.5	2.6	28	ASTM Alloy 825
Sanicro® 35	N08935	≤0.030	≤0.5	27	35	6.5	53	ASTM A213, A269, A312; EN 10216-5

Other grades and sizes available upon request. *254 SMO is a trademark owned by Outokumpu OY.

**Pitting Resistance Equivalent Number (PREN) is calculated using the following formula (PREN = 1 x %Cr + 3.3 x %Mo + 16 x %N).

Setting a higher standard on hardness

HRB 80 – pioneered by Alleima for ASTM 316L

So, what's considered an acceptable hardness level? As shown in the table to the right, the maximum allowable hardness for an ASTM 316L tube is HRB 90. Alleima was the first to achieve an HRB 80 (where a low number indicates softer material). This means our tubes are strong, yet slightly softer than the standard, making them easier to grip and bend. We are also able to supply a hardness of HRC 30 with our SAF™ 2507 super-duplex tubes.

Material Hardness Standard

ASTM Grade	Alleima® grade	ASTM	Alleima®
ASTM 316L	Alleima® 3R60	max HRB 90	max HRB 80
UNS S32750	SAF™ 2507	max HRC 32	max HRC 30

HRB (Rockwell B scale) is used for measuring the hardness of softer metals like non-ferrous metals and mild steel, while HRC (Rockwell C scale) is used for harder materials like hardened steel and duplex.

It's time to corrosion-proof your business

2.5% molybdenum versus 2.0% required by ASTM

Studies show that Alleima® 3R60 grade with guaranteed >12.5% Ni a minimum of 2.5% Mo and low carbon outperforms standard 316/L (UNS S31600/S31603) in hot, chloride-containing environments. The difference in nominal chemical composition of the two versions of 316L is shown in Diagram 1.

Given the higher chemical composition of Alleima® 3R60, the study also revealed a significantly higher pitting resistance vs standard 316L produced to the minimum requirements of international standard ASTM. Alleima is consistently always at the top of the standard, with high percentages of nickel, chrome and molybdenum to combat corrosion.

Corrosion-resistant duplex tubes

While Alleima® 3R60 is a reliable all-round material choice, we recommend the 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, Alleima grades performed at the top of the standard compared with the ASTM minimum value (see Diagram 2).

Chemical composition enables higher corrosion resistance

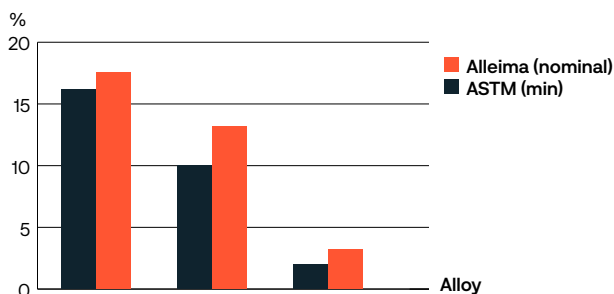
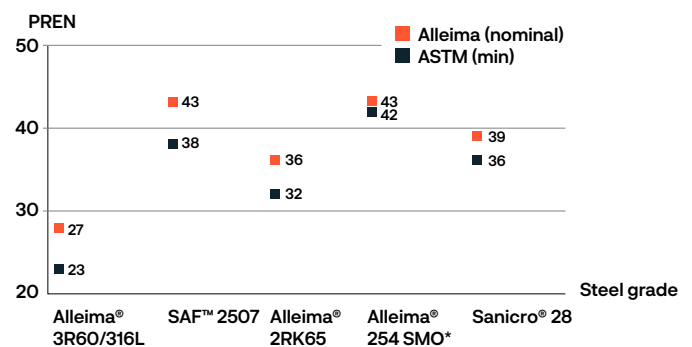


Diagram 1. Key alloy content, Alleima® 3R60 vs ASTM 316/316L PREN value of Alleima and ASTM (min)

Exceeding the standard on pitting resistance



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Diagram 2. PREN values for Alleima grades vs ASTM (min)

