NEWS RELEASE

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NIPPON KINZOKU CO., LTD.

NIPPON KINZOKU “Eco-Product” Series - Vol. 2

Introducing “NK-301ZF”: A Breakthrough Material Combining High Strength and High Ductility

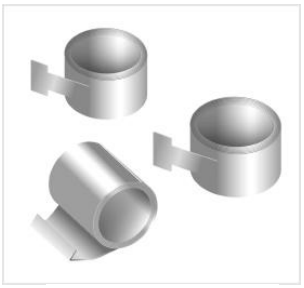
- Challenging Limits: A Material That Achieves the Balance of Two Contradictory Properties -

NIPPON KINZOKU CO., LTD. (TOKYO: 5491) (Headquarters: Minato-ku, Tokyo, President Yasushi Shimokawa) is proud to introduce “NK-301ZF”, spring-use stainless steel that achieves both excellent processability and high strength within the chemical composition range of SUS301 (JIS), as part of its environmentally conscious “Eco-Product” series. This material has been widely adopted in various industries, including the automotive, electronic components, and semiconductors sectors.

NK-301ZF combines high strength with high ductility, enabling both weight reduction of parts and simplification of manufacturing processes. This contributes to improved energy efficiency and reduced environmental impact throughout the customer's entire manufacturing process. Additionally, its enhanced design flexibility allows for optimization of shapes and specifications, leading to improved processing efficiency and yield. These characteristics have led to its adoption in a wide range of applications, as shown in Fig.1.

Smart Phone Components

Diaphragm



Flat spiral spring

Fig.1 Application Examples of NK-301ZF

At our company, NK-301ZF is designated as an “Eco-Product” based on these considerations. We are committed to sustainable manufacturing through the promotion of environmentally friendly materials, with the goal of achieving Net Zero CO_2 emissions by 2050.
This product was developed in accordance with NIPPON KINZOKU's 11th business plan, “NIPPON KINZOKU 2030”, which is focused on the key concept of “Near Net Performance" — achieving the performance required by end products through material design. Our objective is to further expand its sales in the automotive, electronic components, semiconductors, and related markets.

■ Features

1. Chemical Composition

The chemical composition is adjusted to meet the JIS standard range (see Table 1).

Grade	C	Si	Mn	P	S	Ni	Cr
SUS301 (JIS)	0.15 or less	1.00 or less	2.00 or less	0.045 or less	0.030 or less	6.00～8.00	16.00～18.00
NK-301ZF	0.11	0.51	0.59	0.03	0.002	6.7	16.5
SUS301	0.11	0.60	0.84	0.03	0.002	6.8	17.1

Table 1 Comparison of Chemical Composition (typical values)

2. Mechanical Property

Compared to conventional SUS301, NK-301ZF has greater elongation, helping to prevent cracking during forming. It is also a high-strength material that can achieve a hardness level of HV580 or higher (see Table 2). At equivalent strength levels, it offers higher elongation and superior ductility to conventional SUS301 (Fig.2).

Grade	Finish	Hardness (HV)	Tensile Strength (MPa)	Yield Strength (MPa)	Elongation (%)
SUS301 (JIS)	H	430 以上	1,320 以上	1,030 以上	—
NK-301ZF	H	455	1,502	1,210	**20.3**
	SEH	**590**	1,945	1,913	0.5
SUS301	H	453	1,513	1262	14.1

Table 2 Mechanical Properties (typical values)

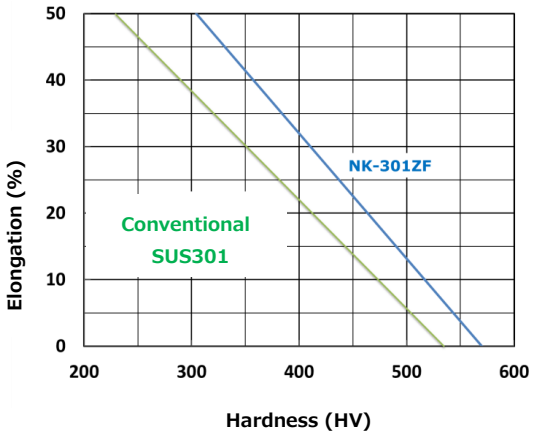
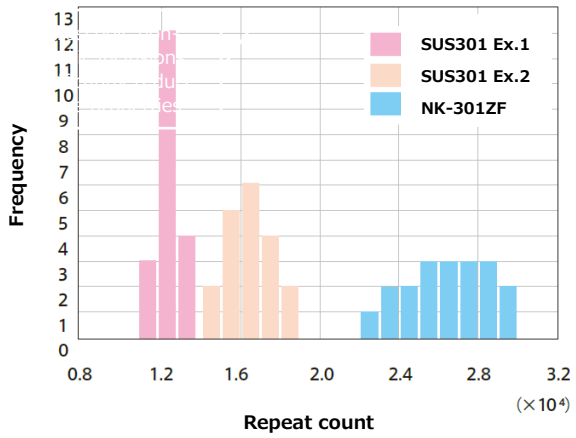


Fig.2 Relationship Between Hardness and Elongation

3. Fatigue Resistance, Processability

Optimizing the manufacturing process with an eye on fatigue resistance is expected to improve fatigue properties (Fig.3).



MIT Test* Conditions

Test Material: NK-301ZF SEH 0.05mm (rolling direction)

Comparison Material: SUS301 SEH 0.05mm (rolling direction)

Bending Radius: 3.6mm Load 9.8N (1,000g)

Bending Angle: 135°, Bending Speed: 175/min.

*MIT Test

A fatigue resistance test for metal foils that measures the number of back-and-forth bending cycles until fracture, by folding a long, narrow piece of metal under tension back and forth a set number of times.

Fig.3 MIT test results

“Overview of Steel Strip Products”

Our original equipment is designed based on our extensive cold-rolling expertise and industry-leading proprietary technologies developed in these facilities. It is ready to meet all of our customers' diverse needs.

URL: https://www.nipponkinzoku.co.jp/en/corporate-profile/business/cold-rolled-stainless-steel-strip

The vision of the 11th Business Plan “NIPPON KINZOKU 2030”

In our 11th Business Plan, we have set a vision to become a "Multi & Hybrid Material Company that co-creates new eco- and human-friendly value." By rolling and composite-forming a wide variety of materials, we aim to achieve the performance required for final products and contribute to the future of both people and the planet. Centered on the key concepts of "Multi & Hybrid Material" (utilizing diverse materials to meet various needs), "Near Net Shape" (realizing complex forming close to the final product shape), and "Near Net Performance," we are advancing future-oriented product development through our proprietary technologies. We are also striving to transform our business structure by focusing on new technologies and products that meet emerging demands.

＊＊＊Contact＊＊＊
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