



Sumiden Wire Products Stainless 316



# MATERIAL SAFETY DATA SHEET

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## Manufacturer's Information

Manufacturer's Name : Sumiden Wire Products Corporation  
Address : 710 Marshall Stuart Drive, Dickson, TN 37055  
Phone Number : 615-446-3199  
Issue Date : 2/9/2005

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Product Name : Stainless Steel Spring Wire Type 316

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Chemical Name : Stainless Steel

## Ingredients :

Base Metal :

Fe : (Balance)

Alloying Elements : (mass%)

C : 0.07 Max.

Si : 1.00 Max.

Mn : 2.00 Max.

P : 0.045 Max.

S : 0.030 Max.

Ni : 10.50 - 13.50

Cr : 16.50 - 18.00

N : 0.10 Max.

Mo : 2.00 - 2.50

Surface Coating:

Coating : Ni & Sulfate (Na, K), Sulfate (Na, K)

Lubricant : Stearate (Ca, Na)

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## Physical Data

1. Physical State : Solid
2. Appearance and Odor : Metal Grey, Odorless
3. Melting Point, Boiling point : N/A

## Personal Protection Information

1. Respiratory Protection :

NIOSH/MSHA approved dust and fume respirator should be used if OSHA PEL is exceeded.

2. Hands, Arms, Body, Eyes, Face Protection :

Use appropriate protective clothing, face shield when welding, burning or grinding.

## Emergency Medical Procedures

First Aid :

In case of excessive exposure to fumes or particulates, remove exposed person to fresh air, and if necessary administer oxygen and seek physician's assistance.

## Safety Information

1. Fire and Explosion :

Steel products in the solid state present no fire or explosion hazard unless it is particulate or exposed in excessive oxygen.

2. Reactivity : Stable under normal condition.

## Spill Leak and Disposal Procedure

1. Spill and Leak : N/A to steel products in the solid state.

2. Disposal : N/A

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# Gibbs Certificate of Analysis

Gibbs Wire & Steel Company, Inc. 3751 Olive Road, South Bend, Indiana 46628

ECONOMY SPRING CO INC  
DE PAOLO DRIVE  
PO BOX 651  
SOUTHINGTON CT 06489 USA

Date Shipped: 03/13/2006  
Cust Order #: 61502  
Amount Shipped: 151.00

Description: 0.0160" P/M.0004  
Type 316 Coated Stainless Steel Wire

Heat Number: 54000

Mill Coil ID:

Gibbs Coil ID:

Gibbs Number: 26460

To Certify that the material shipped against your above order number is in accordance with  
Specification: ASTM-A-313-03

C: 0.0490	Mn: 1.5700	P: 0.0340	Sul: 0.0030
Si: 0.4900	Cr: 17.2700	Ni: 11.8700	Mo: 2.1000
Co:	Cu: 0.4300	N2: 0.0100	Fe:
Ti:	Al:	Be:	W:
Zn:	Sn:	Pb:	Cb:
Ta:	V:		

## PRE-HEAT

## POST-HEAT

MIN

MAX

MIN

MAX

Tensile Strength: 247,000

248,000

Condition CH900:

Mill Source/Rod Source: SUMIDEN

CHANGWON

Reduction of Area:

*Daniela Hanke*

MATERIAL FREE FROM MERCURY CONTAMINATION  
COIL AND WRAP TEST GOOD.

Gibbs Wire & Steel Company, Inc.  
Certification Clerk



### Chemical Compatibility

Our products are leak tested before they are shipped, so you should never find one of our products to leak. If you ever find that one of our products is leaking, chances are you are looking at a chemical compatibility issue. Don't worry, this is an issue that we can solve with a little testing and your help.

The first thing to keep in mind is that you should test every chemical you plan to use with the product. The fact that water worked fine in the first test, has little relevance to the acid that you actually intend to use.

Next, know what to look for. If you find that the couplings are harder to connect then they have been in the past, you might be looking at a chemical compatibility issue. In an extreme case, if you find that the Shut-Off valves "Freeze" open, then you are very likely looking at a chemical issue. No, the products are not designed to work that way, and no it is not a flaw in the product design. What is happening is, at least one of the materials is swelling from the chemical, and because of the close tolerance of our products, the valve is clamped open. Again, this is easily solved with a little testing.

Don't be afraid to talk to us about any issues that you may have, in most cases we can easily solve it. After all, we have a very good idea what we are doing here.

The table listed below is a good place to start your testing. If you see that any of the chemicals are listed as less than good, you may need a different material than what is on our standard products. Go ahead, call us at 970.593.3185 so that we can lend you a hand. Because we offer semi-custom options, we can help you figure out what you need.

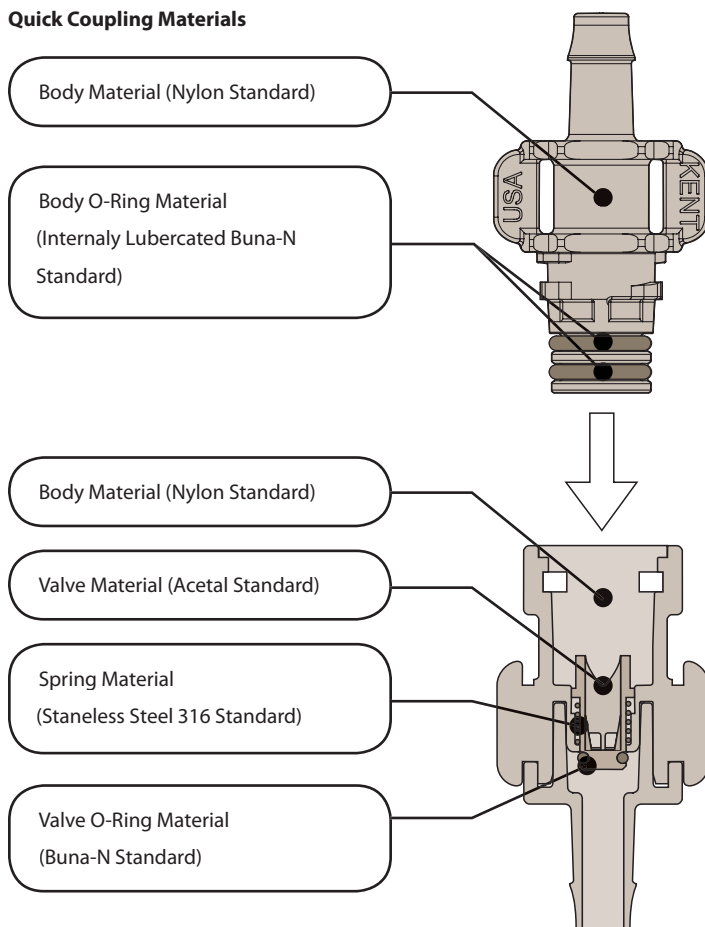
OK now the legal stuff. The data presented in this table is for reference only. We recommend that you obtain Free Samples of our products for your testing. All information is supplied without expressed or implied warranty and does not constitute an endorsement.

Keep in mind that different products will have materials in them. Quick couplings have a number of different materials and are some times not visible when looking at the product. Be sure to test properly test your products before use.

We specialize in solutions and can solve most chemical issues



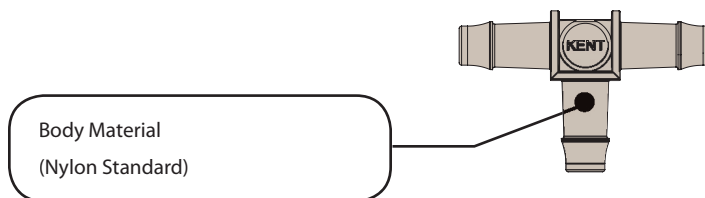
### Quick Coupling Materials



### Quick Coupling Chemical Compatibility Symptoms

- Hard Connection or Disconnection
- Valve "Freezing"
- Leaking from the Coupling
- Leaking from the Valve

### Fitting Materials



### Tube Fitting Chemical Compatibility Symptoms

- Product Becoming Softer
- Leaking From Side Wall
- Leaking around barb

## Chemical Compatibility Information (Plastic Materials)

CHEMICAL	NYLON	ACETAL	POLYPROPYLENE	POLYCARBONATE	PVDF (KYNAR®)
Acetic Acid	Severe Effect	Severe Effect	B-Good	B-Good	C-Fair
Acetone	Excellent	Excellent	A-Excellent	D-Severe Effect	D-Severe Effect
Acetylene	Excellent	Excellent	A-Excellent	D-Severe Effect	A-Excellent
Alcohols:Amyl	Excellent	Excellent	B-Good	B-Good	A-Excellent
Alcohols:Benzyl	Good	Excellent	A-Excellent	N/A	A-Excellent
Alcohols:Butyl	Severe Effect	Excellent	A-Excellent	A-Excellent	A-Excellent
Alcohols:Diacetone	Excellent	Excellent	B-Good	N/A	A-Excellent
Alcohols:Ethyl	Excellent	Excellent	A-Excellent	B-Good	N/A
Alcohols:Hexyl	Excellent	Excellent	N/A	N/A	N/A
Alcohols:Isobutyl	Excellent	Excellent	A-Excellent	N/A	N/A
Alcohols:Isopropyl	Severe Effect	Excellent	A-Excellent	A-Excellent	N/A
Alcohols:Methyl	Good	Excellent	A-Excellent	B-Good	A-Excellent
Alcohols:Octyl	Excellent	Excellent	N/A	N/A	N/A
Alcohols:Propyl	Severe Effect	Excellent	A-Excellent	N/A	A-Excellent
Aluminum Hydroxide	Excellent	Excellent	A-Excellent	B-Good	A-Excellent
Antifreeze	Severe Effect	Severe Effect	D-Severe Effect	N/A	N/A
Barium Sulfate	Excellent	Good	B-Good	D-Severe Effect	A-Excellent
Benzene	Excellent	Excellent	D-Severe Effect	D-Severe Effect	A-Excellent
Benzoic Acid	Severe Effect	Good	B-Good	B-Good	A-Excellent
Brewery Slop	N/A	Good	N/A	N/A	N/A
Butter	N/A	Excellent	N/A	N/A	N/A
Buttermilk	Good	Excellent	A-Excellent	A-Excellent	N/A
Cane Juice	Excellent	Excellent	C-Fair	N/A	A-Excellent
Carbon Dioxide (dry)	Excellent	Excellent	A-Excellent	N/A	A-Excellent
Carbon Monoxide	Excellent	Excellent	A-Excellent	N/A	B-Good
Carbon Tetrachloride	Severe Effect	Good	D-Severe Effect	D-Severe Effect	A-Excellent
Catsup	Excellent	Good	A-Excellent	N/A	N/A
Chlorine (dry)	Severe Effect	Severe Effect	D-Severe Effect	N/A	A-Excellent
Chlorine Water	Fair	Severe Effect	D-Severe Effect	N/A	B-Good
Chlorobenzene (Mono)	Severe Effect	Severe Effect	C-Fair	D-Severe Effect	A-Excellent
Chocolate Syrup	Excellent	Excellent	A-Excellent	A-Excellent	N/A
Clorox® (Bleach)	Excellent	Severe Effect	D-Severe Effect	N/A	A-Excellent
Coffee	Excellent	Excellent	A-Excellent	N/A	N/A
Cyclohexanone	Excellent	Excellent	D-Severe Effect	D-Severe Effect	D-Severe Effect
Diesel Fuel	Excellent	Excellent	A-Excellent	A-Excellent	A-Excellent
Ethanol	Excellent	Excellent	A-Excellent	B-Good	N/A
Ethyl Acetate	Excellent	Excellent		D-Severe Effect	D-Severe Effect
Ethylene Glycol	Excellent	Good	A-Excellent	B-Good	A-Excellent
Fluorine	Severe Effect	Severe Effect	D-Severe Effect	C-Fair	A-Excellent
Fruit Juice	Excellent	Severe Effect	B-Good	N/A	A-Excellent
Gasoline (high-aromatic)	Excellent	Good	A-Excellent	A-Excellent	A-Excellent
"Gasoline, leaded, ref."	Excellent	Excellent	B-Good	A-Excellent	A-Excellent
"Gasoline, unleaded"	Excellent	Excellent	C-Fair	A-Excellent	A-Excellent
Grape Juice	Excellent	Excellent	N/A	N/A	A-Excellent
Honey	Excellent	Excellent	A-Excellent	A-Excellent	A-Excellent
Hydrocyanic Acid	Good	Good	C-Fair	N/A	A-Excellent
Hydrogen Peroxide 100%	Severe Effect	Severe Effect	B-Good	A-Excellent	A-Excellent
"Jet Fuel (JP3, JP4, JP5)"	Fair	Excellent	A-Excellent	A-Excellent	B-Good
Kerosene	Excellent	Excellent	B-Good	D-Severe Effect	A-Excellent
Magnesium Chloride	Excellent	Good	A-Excellent	A-Excellent	A-Excellent
Methanol (Methyl Alcohol)	Good	Excellent	A-Excellent	B-Good	A-Excellent
Methyl Ethyl Ketone	Excellent	Fair	B-Good	D-Severe Effect	D-Severe Effect
Milk	Excellent	Excellent	B-Good	A-Excellent	A-Excellent
Motor oil	Excellent	Good	A-Excellent	A-Excellent	B-Good
Nitric Acid (Concentrated)	Severe Effect	Severe Effect	D-Severe Effect	C-Fair	A-Excellent
Ozone	Severe Effect	Fair	B-Good	A-Excellent	A-Excellent
Phenol (10%)	Severe Effect	Good	B-Good	B-Good	A-Excellent
Rum	Excellent	Excellent	A-Excellent	N/A	N/A
Sea Water	Excellent	Excellent	A-Excellent	A-Excellent	A-Excellent
Sodium Chloride	Excellent	Excellent	A-Excellent	A-Excellent	A-Excellent
Sodium Hydroxide (80%)	Fair	Severe Effect	A-Excellent	D-Severe Effect	A-Excellent
Sulfuric Acid (75-100%)	Severe Effect	N/A	C-Fair	D-Severe Effect	A-Excellent
Sulfuric Acid (cold concentrated)	Severe Effect	N/A	A-Excellent	N/A	A-Excellent
Sulfuric Acid (hot concentrated)	Severe Effect	N/A	D-Severe Effect	D-Severe Effect	C-Fair
Tetrahydrofuran	Excellent	Excellent	C-Fair	D-Severe Effect	B-Good
Toluene (Toluol)	Excellent	Fair	C-Fair	D-Severe Effect	A-Excellent
Trichloroethylene	Fair	Severe Effect	C-Fair	N/A	B-Good
Urine	Good	Excellent	A-Excellent	N/A	A-Excellent
Water:Deionized	Excellent	N/A	A-Excellent	N/A	A-Excellent
Water:Distilled	Excellent	Good	A-Excellent	A-Excellent	A-Excellent
Water:Fresh	Excellent	Excellent	A-Excellent	A-Excellent	A-Excellent
Water:Salt	Excellent	Excellent	A-Excellent	A-Excellent	A-Excellent
Whiskey & Wines	Excellent	Excellent	A-Excellent	A-Excellent	A-Excellent

Disclaimer: The data presented in this publication is for reference only. It was compiled primarily from outside sources provided by feedstock materials suppliers and resin manufacturers, and is offered to our customers as a means of comparing the characteristics of resins and materials used by KENT Systems at the time of publication. The particular conditions of your use and application of our products are beyond our control. Thus, it is imperative that you test our products in your specific application to determine their ultimate suitability. All information is provided without implied or expressed warranty or guarantee by KENT Systems, or the resin and feedstock manufacturers. KENT Systems assumes no liability with respect to the accuracy or completeness of the information contained herein and none of the information provided constitutes a recommendation or endorsement of any kind by KENT Systems.

## Chemical Compatibility Information (Springs and O-Rings)

CHEMICAL	BUNA-N	VITON A	EPDM	SILICONE	STAINLESS STEEL
Acetic Acid	Fair	Good	Excellent	C-Fair	Severe Effect
Acetone	Severe Effect	Severe Effect	Excellent	D-Severe Effect	Excellent
Acetylene	Good	Excellent	Excellent	B-Good	Excellent
Alcohols:Amyl	Good	Excellent	Excellent	D-Severe Effect	Excellent
Alcohols:Benzyl	Severe Effect	Excellent	Good	N/A	Good
Alcohols:Butyl	Fair	Excellent	Excellent	B-Good	Excellent
Alcohols:Diacetone	Severe Effect	Severe Effect	Excellent	D-Severe Effect	Excellent
Alcohols:Ethyl	Fair	Excellent	Excellent	B-Good	Excellent
Alcohols:Hexyl	Excellent	Fair	Fair	B-Good	Excellent
Alcohols:Isobutyl	Good	Excellent	Excellent	A-Excellent	Excellent
Alcohols:Isopropyl	Good	Excellent	Excellent	A-Excellent	Good
Alcohols:Methyl	Excellent	Fair	Excellent	A-Excellent	Excellent
Alcohols:Octyl	Good	Good	Excellent	B-Good	Excellent
Alcohols:Propyl	Excellent	Excellent	Excellent	A-Excellent	Excellent
Aluminum Hydroxide	Excellent	Excellent	Excellent	N/A	Excellent
Antifreeze	Excellent	Excellent	Excellent	C-Fair	N/A
Barium Sulfate	Excellent	Excellent	Excellent	A-Excellent	Good
Benzene	Severe Effect	Excellent	Severe Effect	D-Severe Effect	Good
Benzoic Acid	Severe Effect	Excellent	Severe Effect	B-Good	Good
Brewery Slop	Excellent	Excellent	N/A	N/A	N/A
Butter	Excellent	Excellent	Excellent	B-Good	Fair
Buttermilk	Excellent	Excellent	Excellent	A-Excellent	Excellent
Cane Juice	Excellent	Excellent	Excellent	A-Excellent	Excellent
Carbon Dioxide (dry)	Excellent	Good	Good	B-Good	Excellent
Carbon Monoxide	Excellent	Excellent	Excellent	A-Excellent	Excellent
Carbon Tetrachloride	Severe Effect	Excellent	Severe Effect	D-Severe Effect	Good
Catsup	Excellent	Excellent	Excellent	N/A	Excellent
Chlorine (dry)	Good	Excellent	Excellent	D-Severe Effect	Excellent
Chlorine Water	Severe Effect	Excellent	Fair	D-Severe Effect	Fair
Chlorobenzene (Mono)	Severe Effect	Excellent	Severe Effect	D-Severe Effect	Excellent
Chocolate Syrup	Excellent	Excellent	Excellent	N/A	Excellent
Clorox® (Bleach)	Severe Effect	Excellent	Good	N/A	Excellent
Coffee	Excellent	Excellent	Excellent	A-Excellent	Excellent
Cyclohexanone	Severe Effect	Severe Effect	Good	D-Severe Effect	Excellent
Diesel Fuel	Excellent	Excellent	Severe Effect	D-Severe Effect	Excellent
Ethanol	Fair	Excellent	Excellent	B-Good	Excellent
Ethyl Acetate	Severe Effect	Severe Effect	Good	B-Good	Good
Ethylene Glycol	Excellent	Excellent	Excellent	A-Excellent	Good
Fluorine	Severe Effect	Fair	Excellent	D-Severe Effect	Fair
Fruit Juice	Excellent	Excellent	N/A	N/A	Excellent
Gasoline (high-aromatic)	Excellent	Excellent	Severe Effect	D-Severe Effect	Excellent
"Gasoline, leaded, ref."	Excellent	Excellent	Severe Effect	D-Severe Effect	Excellent
"Gasoline, unleaded"	Excellent	Excellent	Severe Effect	D-Severe Effect	Excellent
Grape Juice	Excellent	Excellent	Excellent	A-Excellent	Excellent
Honey	Excellent	Excellent	Excellent	A-Excellent	Excellent
Hydrocyanic Acid	Good	Excellent	Excellent	D-Severe Effect	Good
Hydrogen Peroxide 100%	Severe Effect	Excellent	Severe Effect	B-Good	Good
"Jet Fuel (JP3, JP4, JP5)"	Excellent	Excellent	Severe Effect	D-Severe Effect	Excellent
Kerosene	Excellent	Excellent	Severe Effect	D-Severe Effect	Excellent
Magnesium Chloride	Excellent	Excellent	Excellent	A-Excellent	Severe Effect
Methanol (Methyl Alcohol)	Excellent	Fair	Excellent	A-Excellent	Excellent
Methyl Ethyl Ketone	Severe Effect	Severe Effect	Excellent	D-Severe Effect	Excellent
Milk	Excellent	Excellent	Excellent	A-Excellent	Excellent
Motor oil	Excellent	N/A	Severe Effect	N/A	Excellent
Nitric Acid (Concentrated)	Severe Effect	Excellent	Severe Effect	D-Severe Effect	Excellent
Ozone	Severe Effect	Excellent	Excellent	A-Excellent	Good
Phenol (10%)	Severe Effect	Excellent	Good	D-Severe Effect	Good
Rum	Excellent	Excellent	Excellent	A-Excellent	Excellent
Sea Water	Excellent	Excellent	Excellent	A-Excellent	Fair
Sodium Chloride	Excellent	Excellent	Excellent	A-Excellent	Good
Sodium Hydroxide (80%)	Severe Effect	Severe Effect	Good	A-Excellent	Fair
Sulfuric Acid (75-100%)	Fair	Excellent	Good	D-Severe Effect	Fair
Sulfuric Acid (cold concentrated)	Severe Effect	Good	Fair	D-Severe Effect	Fair
Sulfuric Acid (hot concentrated)	Severe Effect	Excellent	Severe Effect	D-Severe Effect	Severe Effect
Tetrahydrofuran	Severe Effect	Severe Effect	Severe Effect	D-Severe Effect	Excellent
Toluene (Toluol)	Severe Effect	Fair	Severe Effect	D-Severe Effect	Excellent
Trichloroethylene	Severe Effect	Excellent	Severe Effect	D-Severe Effect	Good
Urine	Excellent	Excellent	Excellent	N/A	Excellent
Water:Deionized	Excellent	Excellent	Excellent	N/A	Excellent
Water:Distilled	Excellent	Excellent	Excellent	C-Fair	Excellent
Water:Fresh	Excellent	Excellent	Excellent	B-Good	Excellent
Water:Salt	Excellent	Excellent	Excellent	B-Good	Good
Whiskey & Wines	Excellent	Excellent	Excellent	A-Excellent	Excellent

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