

Drives, Incorporated Roller Conveyor Products

Corrosion/Moisture Resistant Chain

304 Stainless Steel Series

The primary use of 304 stainless steel chain is in corrosive and/or high temperature environments, which shorten life of standard carbon steel roller chains. Drives, Incorporated offers both standard and attachment chains in 304 stainless steel. The 304 stainless steel chains give excellent resistance to corrosion and high temperatures. 304 stainless steel is generally considered non-magnetic but may have some degree of permeability due to machining of some parts.

316 Stainless Steel Series

The primary use of 316 stainless steel chain is in highly corrosive and/or extreme temperatures, which shorten the life of 304 stainless steel chains. Drives, Incorporated offers both standard and attachment chains in 316 stainless steel. The 316 stainless steel chains are our highest available corrosion resistant chains. It also has the highest resistance to extreme temperatures. The 316 stainless steel series chains are sometimes referred to as the non-magnet series because of its extremely low magnetic permeability.

400 and 600 Stainless Steel Series

The primary use of 400 and 600 stainless steel chain is in corrosive and/or high temperature environments, which shorten life of standard carbon steel chain. Drives, Incorporated offers both standard and attachment chains in 400 and 600 stainless steel. The 400 and 600 stainless steel chains have less corrosion resistance than 304 stainless steel, but the hardened round parts provide for better wear life than 304 stainless steel chains. These chains are excellent for drive applications, which normally have a high number of articulations.

Specialty Stainless Steel Series

317 Stainless Steel and other specialty corrosion resistant chain products available upon request. Please contact Drives, Inc. Engineering.

See Conveyor Chain and Attachment Chain product catalogs for complete product information.

Drives, Incorporated Corrosion Resistant Chain Products

Corrosion Resistant Chain

Substance	Concentration	Temp. F	Temp. C	600 SS	400 SS	304 SS	316 SS
Acetone		154	68	A	C	A	A
Oil (Plant, Mineral)		154	68	A	A	A	A
Linseed Oil	100%	154	68	B	A	A	A
Sulfur Dioxide		154	68	C	C	A	A
Alcohol			68	A	A	A	A
Ammonia Water		154	68	A	A	A	A
Whiskey		154	68	A	A	A	A
Ethyl		154	68	A	A	A	A
Zinc Chloride	50%	154	68	D	D	B	B
Sal Ammoniac	50%	Boiling	Boiling	C	D	B	A
Potassium	Saturation	154	68	B	A	A	A
Calcium Chloride	Saturation	154	68	D	D	B	A
Ferric Chloride	5%	154	68	D	D	B	B
Sodium Chloride	5%	154	68	B	B	A	A
Chlorine Gas		154	68	D	D	D	B
Chlorinated Water				D	D	D	A
Oleic Acid		154	68	A	A	A	A
Sea-water		154	68	C	C	B	A
Sodium Perchlorate	10%	Boiling	Boiling	D	D	A	A
Hydrogen Peroxide	30%	154	68	B	B	A	A

Substance	Concentration	Temp. F	Temp. C	600 SS	400 SS	304 SS	316 SS
Gasoline		154	68	A	A	A	A
Potassium Permanganate	Saturation	154	68	A	A	A	A
Ferric Acid	50%	154	68	A	A	A	A
Milk		154	68	A	A	A	A
Citric Acid	50%	154	68	A	A	A	A
Glycerol		154	68	A	A	A	A
Creosote		154	68	A	A	A	A
Chromic Acid	5%	154	68	B	B	A	A
Ketchup		154	68	A	A	A	A
Developing Solution		154	68	B	B	A	A
Synthetic Detergent				A	A	A	A
Coffee		Boiling	Boiling	A	A	A	A
Syrup				A	A	A	A
Acetic Acid	10%	154	68	A	A	A	A
Sugar Solution		154	68	A	A	A	A
Calcium Hypochloride	11-14%	154	68	C	C	A	A
Sodium Hypochloride	10%	154	68	D	D	D	A
Sodium Cyanide		154	68	--	--	A	A
Carbon Tetrachloride		154	68	A	A	A	A
Potassium Bichromate	10%	154	68	A	A	A	A
Oxalic Acid	10%	154	68	B	B	A	A
Tartaric Acid	6%	154	68	A	A	A	A

A = Total Resistance

B = Partial Resistance

C = Satisfactory Resistance

D = Not Recommended

Drives, Incorporated Corrosion Resistant Chain Products

Corrosion Resistant Chain

Substance	Concentration	Temp. F	Temp. C	600 SS	400 SS	304 SS	316 SS
Nitric Acid	Saturation	Boiling	Boiling	B	B	A	A
Ammonium Nitrate		154	68	A	A	A	A
Potassium Nitrate	25%	154	68	A	A	A	A
Potassium Nitrate	25%	Boiling	Boiling	D	D	A	A
Vinegar		154	68	C	C	B	A
Potassium Hydroxide	20%	154	68	A	A	A	A
Calcium Hydroxide	20%	Boiling	Boiling	A	A	A	A
Sodium Hydroxide	25%	154	68	A	A	A	A
Formic Acid	100%	Boiling	Boiling	C	C	C	A
Soft Drink		154	68	A	A	A	A
Hydroxibenzene		154	68	A	A	A	A
Petroleum		Boiling	Boiling	A	A	A	A
Soap & Water Solution		154	68	A	A	A	A
Phosphate				A	A	A	A
Sodium Hydrocarbonate		154	68	A	A	A	A
Sodium Carbonate	Saturation	Boiling	Boiling	A	A	A	A
Sodium Thiosulfate	25%	Boiling	Boiling	A	A	A	A
Turpentine		203	95	A	A	A	A
Kerosene		154	68	A	A	A	A
Vamish				A	A	A	A
Heavy Nitric Acid	85%	154	68	D	D	A	A
Heavy Nitric Acid	65%	154	68	D	D	B	B
Lactic Acid	10%	154	68	B	B	A	A
Honey				A	A	A	A
Paraffin		154	68	A	A	A	A
Beer		154	68	A	A	A	A
Picric Acid	Saturation			A	A	A	A

Substance	Concentration	Temp. F	Temp. C	600 SS	400 SS	304 SS	316 SS
Fruit Juice		154	68	B	B	A	A
Benzene		154	68	A	A	A	A
Boric Acid	50%	Boiling	Boiling	A	A	A	A
Formalin	40%	154	68	A	A	A	A
Mayonnaise		154	68	B	B	A	A
Water				A	A	A	A
Vegetable Juice		154	68	A	A	A	A
Lard				A	A	A	A
Butyric Acid		154	68	A	A	A	A
Hydrogen Sulfide (dry)				A	A	A	A
Hydrogen Sulfide (wet)				D	D	D	D
Sulfuric Acid	5%	154	68	D	D	D	A
Zinc Sulfate	25%	154	68	A	A	A	A
Aluminum Sulfate	Saturation	154	68	D	D	A	A
Ammonium Sulfate	Saturation	154	68	B	B	A	A
Sodium Sulfate	Saturation	154	68	A	A	A	A
Malic Acid	50%	Boiling	Boiling	A	A	A	A
Phosphoric Acid	5%	154	68	B	B	A	A
Phosphoric Acid	10%	154	68	B	B	B	B
Wine		154	68	A	A	A	A

A = Total Resistance

B = Partial Resistance

C = Satisfactory Resistance

D = Not Recommended

Drives, Incorporated Corrosion Resistant Chain Products

Made in U.S.A.

Stainless Steel

Materials of Component Parts

	Link Plate	Pin	Bushing	Roller
304 Series	AISI 304	AISI 304	AISI 304	AISI 304
316 Series	AISI 316	AISI 316	AISI 316	AISI 316
400 Series	AISI 304	AISI 431	AISI 403	AISI 403
600 Series	AISI 304	600 APH	600 APH	600 APH

*PH: Precipitation Hardened

Performance of Anti-corrosive Chains

	Corrosion Resistance	Temperature Resistance	Magnetism	Wear Resistance
NP Chain	Acceptable for outdoor and decorative applications.	14°F - 140°F (Never use below -4°F or above 300°F)	Magnetic	Excellent
400 & 600 Series	Good for general acid, alkali and water.	-40°F ~ 750°F (Never use over 930°F)	Magnetic	Very Good
304 Series	Good for general acid, alkali and water.	-40°F ~ 750°F (Never use below -270°F or over 1300°F)	Slightly magnetic due to cold forming of parts	Fair
316 Series	Superior to the other stainless material.	-40°F ~ 750°F (Never use below -270°F or over 1500°F)	Non-magnetic	Fair

Chain Selection

General selection is based on bearing pressure between the pin and bushing. Anti-corrosive roller chains are normally intended to be used at slow speed without lubrication. Chain selection should be made based on the bearing pressure as shown below.

	Max. Allowable Bearing Pressure Between Pin & Bushing	Maximum Operating Speed
304 & 316 Series	1,420 psi	230 Ft./Min.
400 & 600 Series	2,130 psi	230 Ft./Min.

Chain selection can be made using the following formula.

$$\boxed{\text{Maximum Chain Tension}} \times \boxed{\text{Service Factor}} \times \boxed{\text{Speed Coefficient}} \times \boxed{\text{Temperature Factor}} \leq \boxed{\text{Maximum Allowable Load}}$$

Maximum allowable load or maximum bearing pressure as shown above can be doubled only when chain is used in group "A" of the "Corrosion Resistance Guide" on pages 41-42 and properly lubricated.

Maximum Allowable Load

The chain's maximum allowable load can be obtained by the formula:
(Maximum allowable bearing pressure) X (Bearing area between pin and bushing)

	304 & 316 Series	400 & 600 Series
25	26 Lbs.	36 Lbs.
35	66 Lbs.	90 Lbs.
40	100 Lbs.	155 Lbs.
50	165 Lbs.	230 Lbs.
60	231 Lbs.	350 Lbs.
80	396 Lbs.	600 Lbs.

Service Factor

Type of Impact	Service Factor
Smooth transmission	1.0
Transmission with some impact	1.3
Transmission with large impact	1.5

Speed Coefficient

Chain Speed	Speed Coefficient
0-50 Ft./Min.	1.0
50-100 Ft./Min.	1.2
100-160 Ft./Min.	1.4
160-230 Ft./Min.	1.6

Temperature Factor

Temperature	304 Series	316 Series	400 & 600 Series
~ -270°F	X	X	X
-270°F ~ -40°F	1.0	1.0	X
-40°F ~ 750°F	1.0	1.0	1.0
750°F ~ 930°F	1.2	1.0	1.8
930°F ~ 1,100°F	1.5	1.2	X
1,100°F ~ 1,300°F	1.8	1.5	X
1,300°F ~ 1,500°F	X	2.0	X
1,500°F ~	X	X	X

X = Not suggested.