



MADE IN THE USA

**DIAMOND**  
CHAIN COMPANY

**CORROSION/MOISTURE RESISTANT CHAIN**

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<http://www.diamondchain.com>

# DIAMOND'S CORROSION AND MOISTURE RESISTANT ROLLER CHAINS

  
**DIAMOND**  
CHAIN COMPANY  
317-638-6431  
1-800-US-CHAIN

At Diamond Chain, we take great pride in designing and producing only the highest quality, longest lasting, corrosion and moisture resistant chains. These chains are specifically designed to fit virtually any type of application. Included are applications requiring FDA approval where the chain is an integral component on machines that are frequently washed down with caustic cleaning solutions or constantly exposed to high humidity or external elements.

For over one hundred years, Diamond has not only developed many new chain products, but also has consistently and continuously made improvements to our roller chain to provide the user with the highest degree of quality available. Building high quality roller chain is a matter of demanding precision—a matter of establishing critical parameters, both in component fabrication and final assembly, and monitoring them to ensure they are maintained.



ISO 9001  
CERTIFIED

**Diamond Chain Company is ISO 9001 certified.** ISO 9001 certification is awarded to companies that develop, and consistently adhere to, a well-documented quality system. ISO 9001 requires compliance with 20 elements, some of which include customer service, contract review, manufacturing procedures, product design and development. That means you can be sure that Diamond® chain is consistently manufactured following detailed processes developed by Diamond and proven to produce some of the longest running and best performing roller chain, even in the harshest environment.



Whatever conditions your application must contend with, Diamond's Stainless Steel, Nickel-Plated, or ACE™ (Anti-Corrosion Exterior) chains offer you the proven performance and long service life you require to keep your equipment up and running smoothly through the toughest conditions. This translates into less downtime, lower operating and repair costs and most importantly, increased productivity.



# CORROSION AND MOISTURE RESISTANT ROLLER CHAINS

Diamond Chain now offers a full line of corrosion and moisture resistant products, specially designed to resist attack from water or other, more severe, chemicals. When standard carbon steel just won't hold up in your application, consider the following alternatives.

## **Stainless Steel Chain**

The ultimate in corrosion resistance is stainless steel. When you're looking for a high-quality stainless steel chain, look to Diamond. We offer four optional stainless steel chains: AP Series, 600 Series, 400 Series and 300 Series, all constructed to best suit the requirements of your application.

*Stainless Steel Chain*



## **Nickel-Plated Chain**

Different from many other nickel-plated chains, Diamond Nickel-Plated chain is constructed using components that are electroless nickel-plated before they are assembled. Pre-assembly plating ensures that every surface gets thoroughly covered—every single one. If you want a rust resistant roller chain, capable of the same power transmitting capabilities as carbon steel, turn to a high-quality Diamond Nickel-Plated chain.

*Nickel-Plated Chain*



## **Diamond ACE™**

Finding the right rust resistant chain that offers both high strength and horsepower transmitting capacity, along with superior wear life, just got easier with the introduction of Diamond's ACE (Anti-Corrosion Exterior) chain. Diamond ACE™ is uniquely designed and incorporates an electrochemically bonded, protective exterior coating that is applied to the component parts prior to assembly. The protective coating, a specially formulated Zinc-Nickel Alloy with a Chromate Conversion Coating serves as a barrier that is superior to others' water resistant chains in preserving the physical and structural integrity of the carbon steel base chain.

*ACE Chain*



# STAINLESS STEEL CHAIN



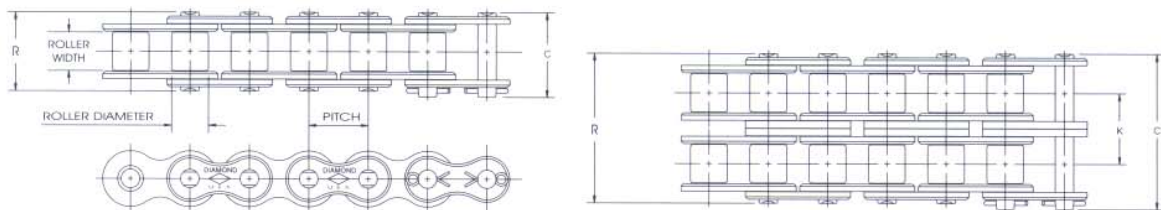
Diamond produces a wide range of Single-Pitch Drive and Double-Pitch Conveyor chains manufactured in four combinations of stainless steel depending upon the specific application.

**AP Stainless Chain:** This chain is assembled using 300 Series (austenitic stainless) link plates, bushings and rollers along with a precipitation-hardened stainless steel pin. This combination increases the wear life of this chain over those constructed entirely of 300 Series components. AP Stainless chains are well suited for food processing, and are approved by the Food and Drug Administration. AP Stainless will be supplied unless otherwise specified.

**300 Series Stainless Chain:** These chains are assembled entirely from 300 Series (austenitic) components. They have excellent corrosion resistance and very low magnetic permeability, but cannot be expected to have the same wear resistance of our heat treated stainless chains. For industries that require it, 300 Series chains can be considered "non-sparking."

**400 Series Stainless Chain:** These chains are manufactured using 300 Series link plates but have pins, bushings and rollers that are produced from 400 Series (martensitic) heat treated stainless. This combination significantly increases wear resistance over those that are constructed using only 300 Series stainless chains. The properties of the 400 Series heat treated parts may, in some instances, cause them to discolor when in contact with certain chemicals.

**600 Series Stainless Chain:** These chains are assembled using 300 Series link plates, with pins, bushings and rollers made from 600 Series (17-4/17-7) precipitation-hardened stainless.



Dimensions in Inches and Pounds

Diamond Number	Pitch Inches	Roller Width	Roller Diameter	Pin Diameter	Link Plate Thickness	C	R	K	Weight Per Foot	Average Tensile Strength
47SS	.1475	.072	*.090	.062	.015	.25	.22	.....	.035	180
25SS	1/4	1/8	*.130	.090	.030	.37	.34	.....	.084	700
25-2SS	1/4	1/8	*.130	.090	.030	.63	.59	.252	.163	1400
35SS	3/8	3/16	*.200	.141	.050	.56	.50	.....	.210	1700
40SS	1/2	5/16	.312	.156	.060	.72	.67	.....	.410	3000
40-2SS	1/2	5/16	.312	.156	.060	1.29	1.24	.566	.800	6000
41SS	1/2	1/4	.306	.141	.050	.65	.57	.....	.280	1700
50SS	5/8	3/8	.400	.200	.080	.89	.83	.....	.680	4700
50-2SS	5/8	3/8	.400	.200	.080	1.60	1.55	.713	1.320	9400
60SS	3/4	1/2	.469	.234	.094	1.11	1.04	.....	1.000	6750
60-2SS	3/4	1/2	.469	.234	.094	2.01	1.94	.897	1.950	13500
80SS	1	5/8	.625	.312	.125	1.44	1.32	.....	1.690	12000

\* Chains are rollerless — dimension shown is bushing diameter.

# NICKEL-PLATED CHAIN

Diamond Nickel-Plated chain provides superior protection from the elements, greatly extending the life of the base chain when operating in wet conditions.

Each individual component of Diamond Nickel-Plated chain is plated before assembly to assure full coverage and plate depth. Diamond's plating process has been specifically chosen to offer the best balance of rust resistance, wear life, dynamic life and appearance for the user's general, all-purpose requirements. This approach is distinctly different from others' who may use a process designed to increase plating hardness and brightness. These types of processes can detract from the chains' resistance to oxidation (rust). Diamond's nickel plating does not add appearance-enhancing brighteners which can reduce the chain's resistance to rust.

Diamond Nickel-Plated chain has been tested side-by-side with standard chain and competitor's nickel-plated chain both in salt spray tests conducted by an independent, licensed laboratory and in special brine immersion wear tests performed in Diamond's engineering testing lab. The results show that Diamond has developed the best overall combination of rust protection and chain performance for your toughest and wettest applications.

The following photographs show the comparison between standard roller chain and Diamond Nickel-Plated roller chain in American Standards for Testing of Materials (ASTM) B117 salt spray testing.

**Standard  
Roller Chain**

*24 hours*



*240 hours*



*500 hours*



**Diamond Nickel-Plated  
Roller Chain**

*24 hours*



*240 hours*



*500 hours*



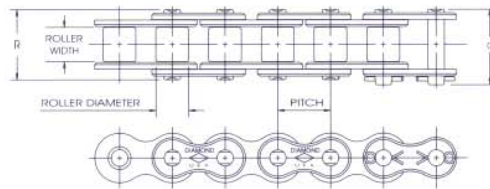
# NICKEL-PLATED CHAIN



Diamond Chain produces a full line of Nickel-Plated roller chains for a variety of uses in environments where the chains are exposed to moisture. Common uses include applications exposed to the weather, high humidity or those on machines that are frequently washed down with water.

Diamond Nickel-Plated chain is different from many rust resistant chains because Diamond virtually eliminates the possibility of stress-corrosion cracking by electroless nickel plating all components. Plating is done before assembly and ensures all components are completely covered, preventing internal rust from seeping out and causing contamination.

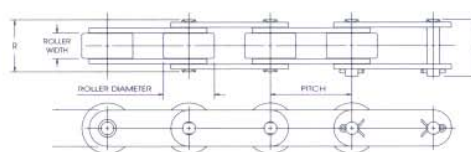
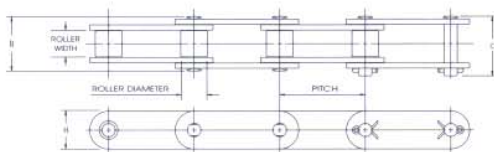
Note: These chains are not intended to resist corrosion from caustic chemicals or acids. Stainless steel chain is normally recommended for those types of applications. Contact Diamond's Application Engineers for assistance in selecting the proper chain for your application.



## Single Pitch Drive Chains

Dimensions in Inches and Pounds

Diamond Number	Pitch Inches	Roller Width	Roller Diameter	Pin Diameter	Link Plate Thickness	C	R	Weight Per Foot	Average Tensile Strength
25NP	1/4	1/8	.130	.090	.030	.370	.340	.085	875
35NP	3/8	3/16	.200	.141	.050	.560	.500	.220	2100
40NP	1/2	5/16	.312	.156	.060	.720	.670	.420	4000
50NP	5/8	3/8	.400	.200	.080	.890	.830	.680	6600
60NP	3/4	1/2	.469	.234	.094	1.110	1.040	.970	8500
80NP	1	5/8	.625	.312	.125	1.440	1.320	1.700	14500
100NP	1 1/4	3/4	.750	.375	.156	1.730	1.610	2.500	24000
120NP	1 1/2	1	.875	.437	.187	2.140	2.000	3.700	34000



## Double Pitch Conveyor Chains

Dimensions in Inches and Pounds

Diamond Number	Pitch Inches	Roller Width	Roller Diameter	Pin Diameter	Link Plate Thickness	C	R	Weight Per Foot	Average Tensile Strength
C2040NP	1	5/16	.312	.156	.060	.760	.680	.340	3700
C2042NP	1	5/16	.625	.156	.060	.760	.680	.340	3700
C2050NP	1 1/4	3/8	.400	.200	.080	.920	.840	.580	6100
C2052NP	1 1/4	3/8	.750	.200	.080	.920	.840	.580	6100
C2060HNP	1 1/2	1/2	.469	.234	.125	1.250	1.180	1.050	8500
C2062HNP	1 1/2	1/2	.875	.234	.125	1.250	1.180	1.050	8500
C2080HNP	2	5/8	.625	.312	.156	1.570	1.450	1.400	14500
C2082HNP	2	5/8	1.125	.312	.156	1.570	1.450	1.400	14500

\* Chains are rollerless — dimension shown is bushing diameter.

# DIAMOND ACE™

The Diamond ACE stands for Anti-Corrosion Exterior chain. ACE starts its life with the same, high quality, Diamond roller chain components but with a special surface treatment applied to resist rusting in even the wettest possible conditions. Each individual part is treated before assembly using a state-of-the-art electrochemical bonding process that provides maximum resistance to red rust (iron oxide) corrosion.

Salt spray and sprocket drive tests have shown that Diamond ACE is superior in balancing corrosion protection and drive performance over other brands of rust resistant chains. Many other products rely on older technology treatments and wax coatings that provide only minimal protection. Diamond ACE employs a two-stage Zinc-Nickel and chromate treatment system along with a protective lubricant that provides corrosion protection as well as extended initial lubrication for wear resistance. The Anti-Corrosion Exterior is specifically designed to permit sacrificial oxidization (zinc oxide) of the outer layer, allowing the chain to function without corrosive attack of the base metal.

Diamond contracted a licensed independent laboratory to evaluate rust resistant chains produced by many of our competitors using the American Standards for Testing of Materials (ASTM) B117 salt spray testing. Below are photographs showing the results of the corrosive attack on one of the better competitive performers compared to the Diamond ACE. The development of red rust (iron oxide) leads to pitting and scaling of the base metal in carbon steel chains and will eventually result in premature chain drive failure. Diamond ACE extends the life of the chain drive by using a sacrificial coating to draw the harmful corrosion away from the base chain. The white coating shown in the photographs below illustrates the Diamond ACE treatment doing exactly what it was designed to do—protecting the base metal to extend the service life of the chain.

## **Competitor's Rust Resistant Chain**

*Salt Spray 240 hours*



*Salt Spray 500 hours*



## **Diamond ACE Anti-Corrosion Exterior Chain**

*Salt Spray 240 hours*



*Salt Spray 500 hours*



# DIAMOND ACE

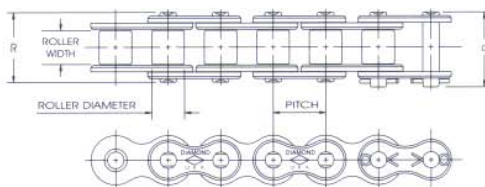


ACE (Anti-Corrosion Exterior) chain is uniquely designed and incorporates an electrochemically bonded, protective exterior coating that is applied to the component parts prior to assembly. Pre-assembly coating ensures all component parts are thoroughly treated, which prevents internal rust from seeping out and causing contamination.

The protective coating, a specially formulated Zinc-Nickel with a Chromate Conversion Coating, serves as an insulating barrier that actually oxidizes before the carbon steel base chain, thus protecting and preserving the chain's physical and structural integrity.

Common applications for Diamond ACE include exposure to weather, high humidity or on machinery that is routinely washed down with water.

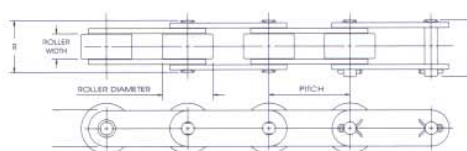
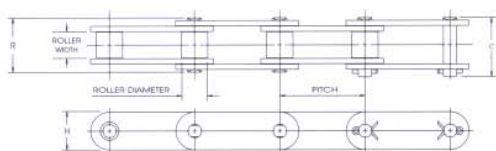
Note: These chains are not intended to resist corrosion from caustic chemicals or acids. Stainless steel chain is normally recommended for those types of applications. Contact Diamond's Application Engineers for assistance in selecting the proper chain for your application.



## Single Pitch Drive Chains

Dimensions in Inches and Pounds

Diamond Number	Pitch Inches	Roller Width	Roller Diameter	Pin Diameter	Link Plate Thickness	C	R	Weight Per Foot	Average Tensile Strength
40 ACE	1/2	5/16	.312	.156	.060	.720	.670	.420	4000
50 ACE	5/8	3/8	.400	.200	.080	.890	.830	.680	6600
60 ACE	3/4	1/2	.469	.234	.094	1.110	1.040	.970	8500
80 ACE	1	5/8	.625	.312	.125	1.440	1.320	1.700	14500



## Double Pitch Conveyor Chains

Dimensions in Inches and Pounds

Diamond Number	Pitch Inches	Roller Width	Roller Diameter	Pin Diameter	Link Plate Thickness	C	R	Weight Per Foot	Average Tensile Strength
C-2040 ACE	1	5/16	.312	.156	.060	.760	.680	.340	3700
C-2042 ACE	1	5/16	.625	.156	.060	.760	.680	.340	3700
C-2050 ACE	1 1/4	3/8	.400	.200	.080	.920	.840	.580	6100
C-2052 ACE	1 1/4	3/8	.750	.200	.080	.920	.840	.580	6100
C-2060H ACE	1 1/2	1/2	.469	.234	.125	1.250	1.180	1.050	8500
C-2062H ACE	1 1/2	1/2	.875	.234	.125	1.250	1.180	1.050	8500
C-2080H ACE	2	5/8	.625	.312	.156	1.570	1.450	1.400	14500
C-2082H ACE	2	5/8	1.125	.312	.156	1.570	1.450	1.400	14500

\* For sizes not listed, contact Diamond for availability on a made-to-order basis

# SELECTING THE PROPER ROLLER CHAIN

Selecting the proper roller chain for a high moisture content or corrosive application is essential in order to achieve the maximum service life based on wear and/or physical attack on the chain's materials. Carbon steel chains offer the user the best balance of cost and performance, however, they are rarely an acceptable option in the presence of water or other oxidizing and corrosive agents.

Shown on this page are some of the key characteristics of Diamond chains, which may be suitable for environments that require the chain to have protection from external elements.

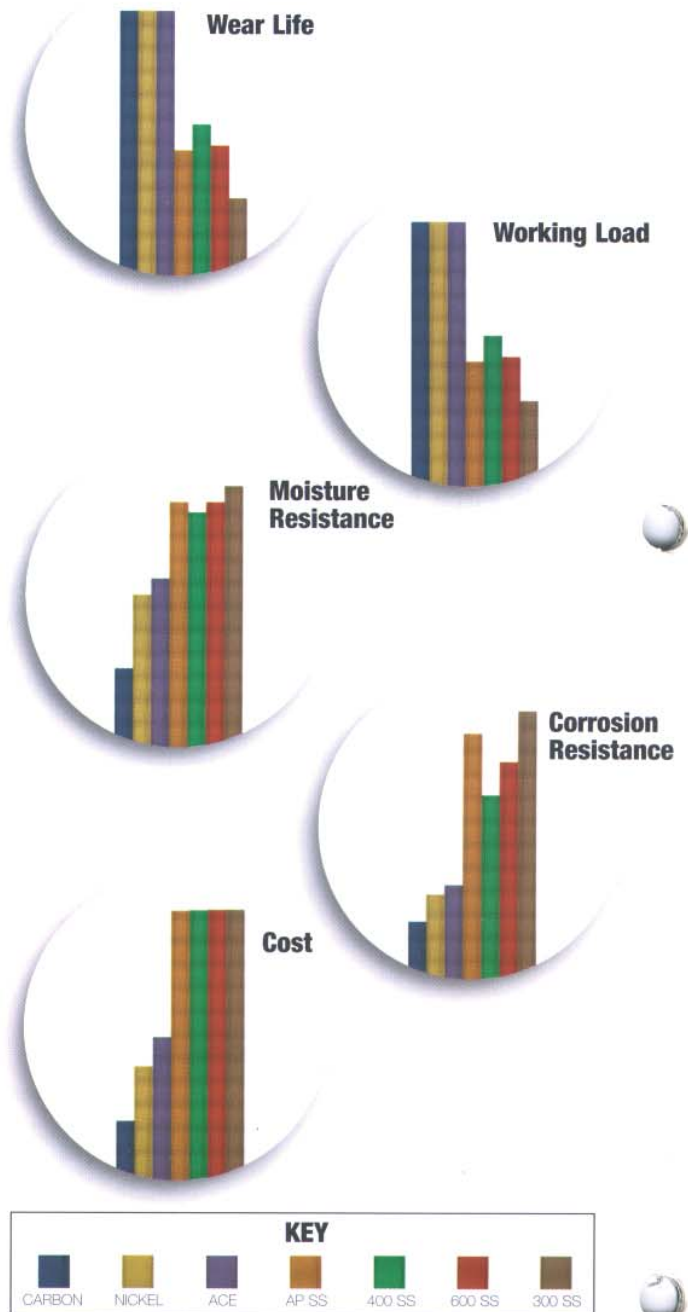
**Wear Life:** Long wear life, in most applications, is the most important attribute the chain can have. The longer the chain can operate, without being removed due to elongation, increases uptime and reduces the overall cost of operation. As the graph shows, Carbon Steel, Nickel-Plated and Diamond ACE all have superior wear life as compared to Stainless Steel. Of the stainless steel chains Diamond provides, the models assembled from heat-treated components offer improved wear life over those which are not heat-treated.

**Working Load:** The allowable working load of a roller chain very closely parallels its ability to resist wear, because wear life and working load capability are most often a function of the material and heat treatment of the pin. A chain's working load is the load the chain is capable of transmitting over long periods of time and should never be confused with the chain's ultimate tensile strength which is the one-time load at which the chain will break.

**Moisture Resistance:** Moisture resistance is the chain's ability to resist iron oxidation (red rust). This oxidation attacks the base material of the chain and can weaken it, ultimately resulting in premature chain drive failure. Stainless steel chains offer the optimum in moisture resistance, but may be too costly. For many of these applications, either Nickel-Plated or ACE may offer the user an acceptable solution.

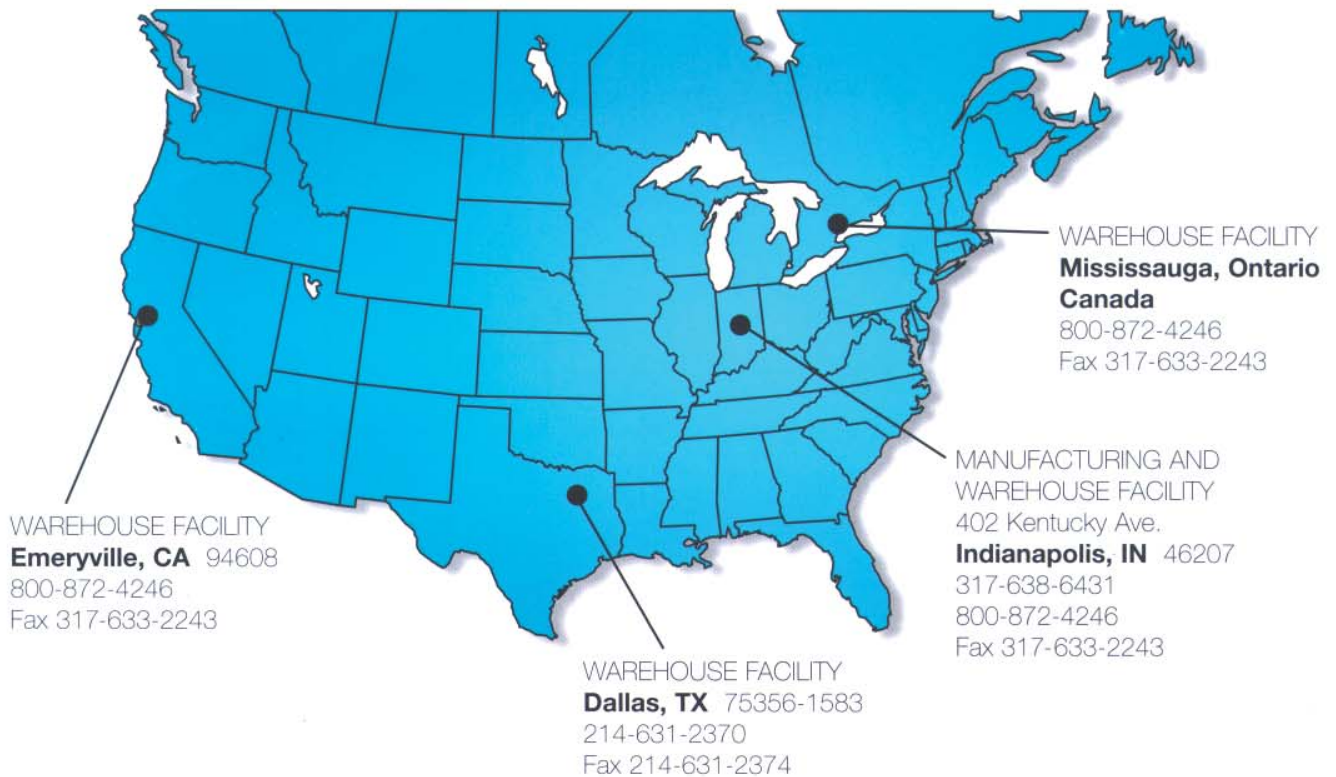
**Corrosion Resistance:** Corrosion resistance is a measure of the chain's ability to resist attack from caustic chemicals or acids, and stainless steel chains are most often recommended for applications such as these. However, depending upon the specific chemicals or concentrations, Nickel-Plated or ACE may offer an acceptable alternative.

**Cost:** Cost is certainly a very important consideration in any chain drive design and installation. Carbon steel chain generally offers the user the lowest cost, but may not be an acceptable alternative based upon the environment or operating conditions. Stainless steel chain generally is the highest cost due to the very expensive base material. Diamond's Nickel-Plated and ACE chains can provide a less costly yet acceptably performing product if the corrosive environment is not too severe.



The determination and selection of chain for a given application is a combination of all the above factors. If additional assistance or information is required, please contact Diamond's Application Engineers for help in selecting the right chain for your operating conditions.

# ORDERING INFORMATION



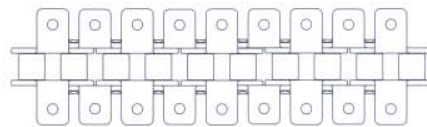
Quantity; catalog number; type; riveted or cottered when optional; and chain length is the basic information needed to order all chain. For multiple strand chain, the construction, press-fit, or slip-fit if optional, must be specified. When ordering attachment chain, contact Diamond Chain's Quotation Department for details on types and availability of attachments.

## Attachments:

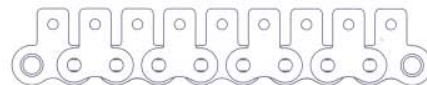


We recognize that many applications require the use of chain assembled with either ANSI standard or unique, non-standard attachments. Diamond Stainless Steel, Nickel-Plated and ACE chains are all available for assembly with a wide selection of stock ANSI standard attachments. Contact Diamond Chain's Quotation Department for information on availability of non-standard attachments to suit your specific application, on a made-to-order basis.

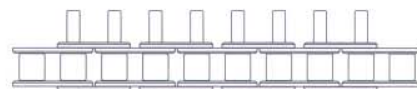
Chain-9 pitches long, with bent attachments, both sides of chain, every pitch.



Chain-9 pitches long, with straight attachments, every pitch.



Chain-9 pitches long, with all pins extended.





MADE IN THE USA

**DIAMOND**  
CHAIN COMPANY

**Nothing Outlasts a Diamond.**

ONE OF THE **Amsted** INDUSTRIES

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