At the Diamond Chain Company, the calling to design and manufacture the world’s highest-performing roller chain is greatly pursued every day by teams of passionate technical experts who have made your success their life’s work. It’s that intensity of focus that some of the world’s greatest inventors trusted to provide the drive chains they needed to transform the world. From the Wright Brothers, to Henry Ford, to the global leaders of our time, Diamond® chain is the roller chain most trusted to perform, when performance matters most.
MATERIALS

The Diamond Chain Company's proprietary material standards and manufacturing processes form the core of the Diamond Difference. The Diamond Difference begins with raw materials that meet exacting standards for metal grade, mechanical properties, and carbon and alloy content to ensure the minimization of impurities that impact tensile and fatigue strength.

These proprietary standards enable Diamond Chain components to maintain tighter tolerances throughout the fabrication and assembly process for a finished product with unparalleled quality, performance, and longevity.
While roller chain would appear to be a simple product, the number of components in a ten foot section of 40 pitch chain totals 1,200 parts, each a potential point for failure.

Diamond Chain designs each component to exacting dimensional standards and has a rigorous quality control system in place to ensure that only qualified pieces reach the final assembly stage.

1. **PLATES**: Inner and outer plates go through a four stage pitch hole process. A multi-stage process is utilized to create a maximum bearing area that is straight, smooth, and burr-free.

2. **PINS**: Precision grinding ensures consistent fit and smooth travel.

3. **ROLLERS**: Seamless roller design and dimensional control allows for extrusion with near perfect roundness.

4. **BUSHINGS**: Dimensional control enables bushings to be extruded with uniform wall thickness and concentricity for smooth travel. Near perfect roundness increases the effective bearing area for the pin.
HEAT TREATMENT

The Diamond Chain Company heat treats components using dedicated carburizing furnaces set to precise temperatures.

Through strict control of both atmosphere and quench, Diamond Chain components receive maximum carbon penetration for a high carbon surface and low carbon core. This process ensures consistent depth of case hardening increasing strength, durability, and wear resistance.
SHOT PEENING

The Diamond Chain Company uses proprietary shot peening machinery. The machinery was developed and custom made to ensure consistent intensity and coverage of components during the shot peen process.

This controlled and repeatable process means that components receive the same level of treatment for consistent compressive surface stress which helps to increase fatigue resistance.
The Diamond Chain Company understands the importance of proper lubrication and the impact on wear life. Diamond Chain uses both a proprietary lubrication formula and hot dip process on all lubricated roller chains. The hot dip process ensures complete coverage of components while the proprietary lubrication maintains maximum continuing surface retention following the treatment. Special additives in the lubrication further enhance corrosion protection and extend wear life.
PRELOADING

The final stage of the manufacturing and assembly process for each Diamond Chain Company roller chain is the preloading process. Preloading approximates the recommended maximum loading during usage and is done to firmly seat pins and bushings in place and eliminate any initial elongation that may take place.
Today’s competitive business environment is demanding. While departmental objectives may appear to conflict at times, employees, managers, and decision makers are really all looking for the same results – improvements in productivity and increases in profitability.

With power transmission applications, improvements in productivity require an honest evaluation of current roller chain performance. While many manufacturers will claim superior performance and wear life, the true difference in performance is only apparent after a chain is installed and in use.

As the global expert in the design and manufacturing of roller chain, and presented with the challenge of taking the guesswork out of selecting the right roller chain, Diamond Chain has partnered with an independent test lab to assess the performance of Diamond Chain products versus those of the competition. The results speak for themselves.
The following charts compare the accelerated wear testing of Diamond Chain products versus those of several leading global chain manufacturers from Asia, Europe, and North America. These tests were performed by Diamond Chain using testing protocols and methodology that were reviewed, verified, and approved by an independent third party.

**ISO / British Standard 12B Accelerated Wear Testing**

- **European Chain MFG A**: 80 HRS
- **European Chain MFG B**: 88 HRS
- **Japanese Chain MFG A**: 114 HRS
- **N. American Chain MFG A**: 155 HRS
- **European Chain MFG C**: 234 HRS
- **Infinity by Diamond Chain**: 291 HRS

Test conditions: 668 RPMs, 462 N of tension, 2.09 kW chain horsepower, and 16T X 16T sprockets.

**ASME / ANSI #50 Chain Accelerated Wear Testing**

- **European Chain MFG A**: 56 HRS
- **N. American Chain MFG A**: 84 HRS
- **Asian Chain MFG A**: 154 HRS
- **Asian Chain MFG B**: 154 HRS
- **N. American Chain MFG B**: 175 HRS
- **European Chain MFG B**: 178 HRS
- **Diamond Series**: 349 HRS

Test conditions: 1172 RPMs, 405 N of tension, 2.61 kW chain horsepower, and 16T X 16T sprockets.
ASME / ANSI #60 CHAIN ACCELERATED WEAR TESTING

Test conditions: 1725 RPMs, 445 N of tension, 3.87 kW chain horsepower, and 16T X 16T sprockets.

ASME / ANSI #80 CHAIN ACCELERATED WEAR TESTING

Test conditions: 668 RPMs, 463 N of tension, 3.09 kW chain horsepower, and 16T X 16T sprockets.
An independent third party performed the same accelerated wear test using ASME / ANSI #50 Diamond Chain product and the same product from two global chain manufacturers. These tests were performed at an independent test facility.

From the test results, two points become clear. First, the Diamond Chain product has significantly outperformed its two competitors. Second, the Diamond Chain products tested performed with much closer consistency. It is the combination of performance and consistency that ultimately has the greatest impact on improving productivity.

Test conditions: 1172 RPMs, 405 N of tension, 2.61 kW chain horsepower, and 16T X 16T sprockets.
WHY INEXPENSIVE CHAIN WILL COST YOU MORE IN THE LONG RUN

When purchasing roller chain, it’s tempting to consider low-priced product options. Most look to balance price and performance, but making a decision based heavily on purchase price is rarely the best option. The small, short term savings that are gained up front typically end up costing significantly more over the life of the product.

Acquisition, or direct cost, is only the tip of the expenditures iceberg. In the illustration below, purchasing the low price product instead of the Diamond roller chain means an upfront savings of 120 €.

What’s not being taken into account are the additional expenses that will be incurred when the low priced chain fails prematurely.

DIRECT COSTS: ONLY THE TIP OF THE ICEBERG
It’s important to keep in mind that some production costs are easy to see, while others require more in-depth analysis.

DIRECT COSTS
DIRECT LABOR
REPLACEMENT CHAIN
LOST PRODUCTION

INDIRECT COSTS
INDIRECT LABOR COST
INDIRECT MATERIAL
INVENTORY TURNOVER
LOST SALES OPPORTUNITIES
LOST MARKET SHARE

120 € in Short Term Savings.
Rather than looking at just product acquisition cost, purchase decisions should instead take into account the Total Cost of Ownership. In this example, third party test results show that it would take three low priced chains to meet the equivalent run time of one Diamond chain.

In addition to having to purchase and install the three low priced roller chains to meet the performance of a single Diamond series chain, a Total Cost of Ownership analysis would also capture additional expenses such as production downtime, idle labor, and scrap costs which easily outweigh the smaller initial savings.

The result is that an upfront savings of 120 €, instead turns into an additional 3,345 € in long term expenses.