



## PT Tech & Torsion Control Products



PT Tech and TCP joined Timken in 2017. Both leaders in their own markets, they were a perfect fit into Timken's strategy of adding highly engineered products into the Industrial Motion offerings. PT Tech and TCP moved under the same leadership in 2020, adding the power of both Sales teams to offer combined solutions to the market. Together with the broader Industrial Motion teams, we can offer solutions to your toughest problems.



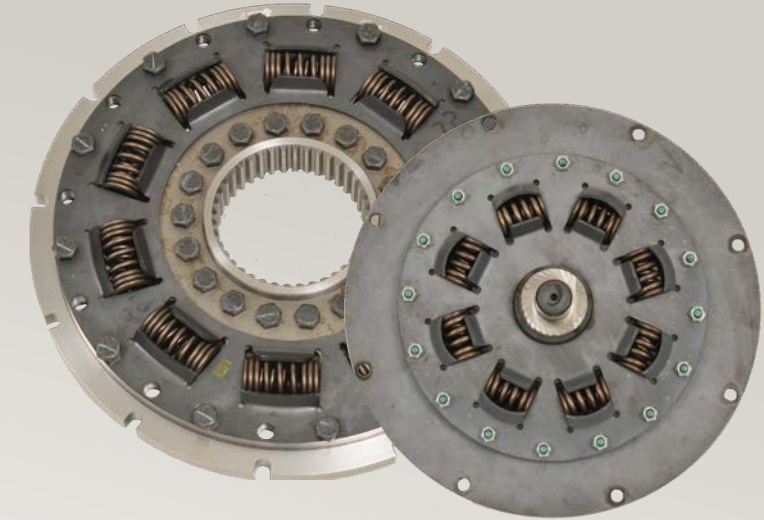
# Our Story

## A History of Trust and Satisfaction

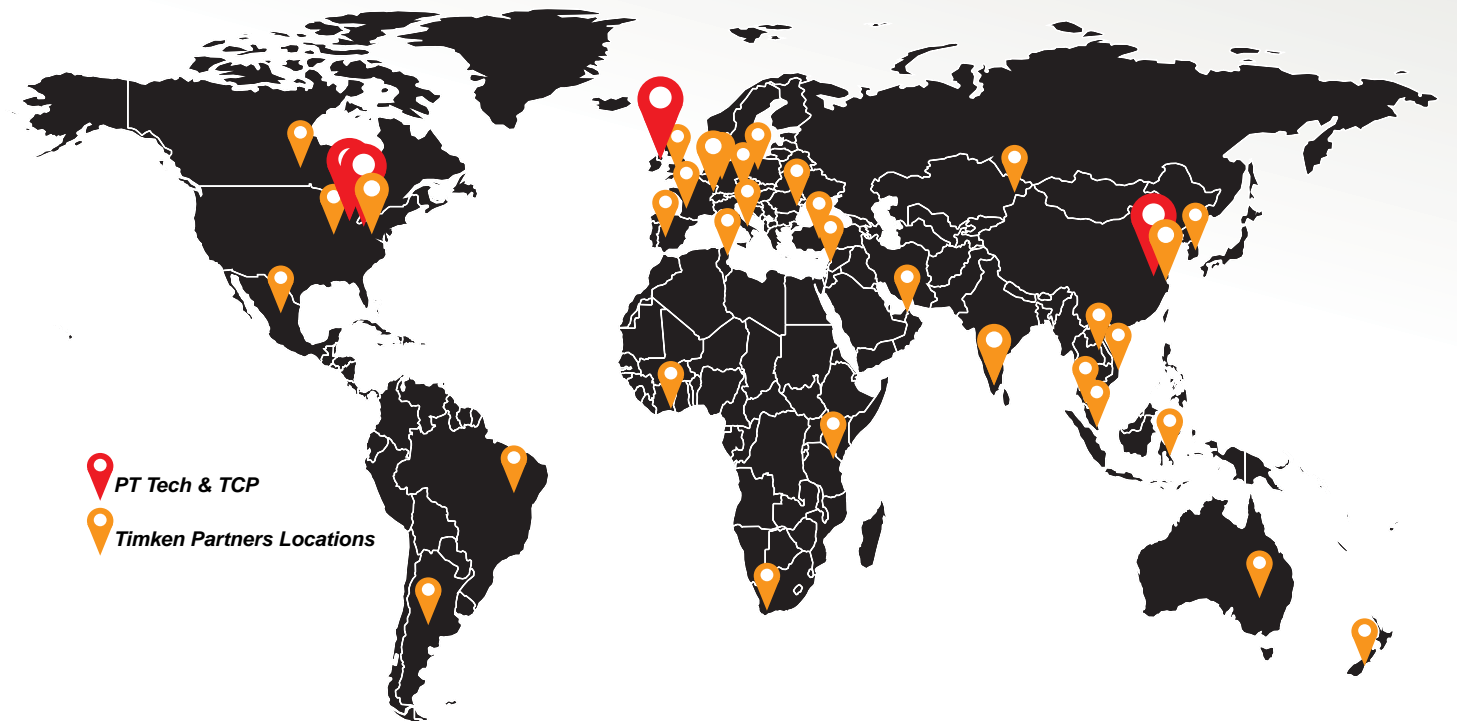
Since 1978, PT Tech has served Original Equipment Manufacturers (OEM's) in the mining, tunnel boring, steel manufacturing, aggregate, road-working, and recycling markets. We have a long history of bringing "Innovation for Extreme Machines". PT Tech began by developing the first TLC Torque Limiter for cutterheads used in underground mining machines. Today we provide the mining industry's standard for protecting drive systems. Our growing line of reliable products include brakes, clutches, torque limiters and gearboxes can be found in the top-rated industrial equipment companies around the world. The PT Tech manufacturing facility is located in Sharon Center, Ohio, USA. Sales representatives and distributors are located throughout the U.S. as well as internationally. PT Tech also has satellite locations in China and the UK. We at PT Tech have a rich history of loyalty both to the satisfaction of our customers and the well being of our employees. We have stood by our

products and services for over 40 years as we continue to grow in size and number. However, at the heart of our organization our mission and values remain, unchanged. We are still dedicated to each and every one of you and every product that leaves our doors. In 2017, PT Tech was purchased by the leader in the Bearing world, Timken Company. Working alongside our sister companies in the Mechanical Powertrain Group (TCP, Lovejoy, Goeneveld/Beka, Diamond and others) and Timken, PT Tech can truly help you optimize and protect your drivetrain. In addition to our headquarters in Ohio, PT Tech has facilities in China and Northern Ireland. Additionally, we have partners around the world to provide the service you deserve. We are a company whose growth is the result of continual product development and innovation. Our longevity is the result of uncompromising customer service. Contact us today to get the most out of your drivetrain.

Since 1987, Torsion Control Products has been the leader in providing custom engineered spring couplings, torque limiters, and torque converter clutches for a wide range of powertrain applications. Our couplings are built to address the demands of the agricultural, construction, industrial, marine, and mining equipment markets. TCP manufactures products for direct/hydraulic pump drives, automatic/power-shift transmissions, compressors, generators, and much more. We are proud to service our customers all over the world, including North America, South America, Asia Pacific, Asia, Europe, and Australia. Spring couplings have been a part of powertrains for more than 80 years. Torsion Control Products (TCP) has developed a line of spring couplings specifically for today's modern diesel engines. These products address the torsional characteristics unique to the diesel engine tier upgrades that produce lower emissions and more power in smaller packages with lower operating speeds. Through the evaluation of



many different applications using Torsional Vibration Analysis, TCP engineers have created products that address the needs of most applications. Whether it is in construction, agricultural, mining, industrial or marine equipment, chances are we have a product that can address the needs of your application. And if we don't, we will create a customized solution just for you.



# Our Markets

Broad Markets, Specialize Solutions



## Aggregates

PT Tech has long been a leader in the aggregate market with our HPTO product line. HPTO was launched in 1999 and invented the computer-controlled PTO clutch market. Leadership in the performance, safety and throughput of your aggregate equipment begins with PT Tech HPTO hydraulic power take off clutches, torque limiters, and control units. TCP spring couplings remove damaging vibrations from the drive trains



## Metals & Steel

Our steel industry products can help your rolling mill main drive, strip levelers, as well as your hoist and trolley brakes, all see extended life. So you can keep on rolling.



## Marine

Our marine products aim to protect some of the world's largest offshore energy and dredge operators from down time in the costliest of environments. PT Tech provides the peace of mind for these applications to avoid flying in replacement parts by increasing uptime and by providing clutch and brake products with reliable long life, using control units specifically designed to help OEM's and Operators maintain your equipment and improve predictive failure.

## Mining

Our top of the line torque limiters and brakes make sure you keep hauling, scooping, shearing, and conveying long after our competitors products have failed.



## Material Processing

We have designed and manufactured torque limiters, wet brakes, and clutch couplings to keep your tire shredders, downhill conveyor brakes, and kiln drives operating safely and efficiently.



## Wood Waste Recycling

PT Tech has long been a leader in the wood waste recycling market with our HPTO product line. HPTO was launched in 1999 and invented the computer-controlled PTO clutch market. Leadership in the performance, safety and throughput of your recycling equipment begins with PT Tech HPTO hydraulic power take off clutches, torque limiters, and control units. TCP spring couplings remove damaging vibrations from the drive trains

# Our Markets

Broad Markets, Specialize Solutions



## Tunnel Boring

In 1986, PT Tech was asked by a leading Tunnel Boring Machine (TBM) manufacturer to assist them in designing an improved driveline. Often, TBMs can become stuck due to changes in the material or collapses across a long tunnel. PT Tech's solution was a specialty high-energy clutch to allow the motor drive inertia to aid in breaking the cutterhead loose. These clutches were first used in the Channel Tunnel dig and have now been used worldwide as a cost effective solution to expensive VFD drives.



## Construction

Modern construction equipment needs the best solutions to manage the demands of new drivetrains. Tier 4 and above engines have more hp per liter, more torque at lower engine speeds, less power during startup. Smaller engines driving bigger equipment, increasing the chance for torsional activity at lower operating speeds. TCP can be found on excavators, graders, scrapers, loaders, tractors, sprayers & combines worldwide.

## Paper & Pulp

Whether processing raw wood into chips or the manufacturing process of turning pulp into paper, PT Tech has proven products for all of your needs. PT Tech's HPTO diesel engine clutches can be found on a wide variety of tree chippers around the world, and our torque limiters are applied to paper rolling lines and other equipment throughout the entire process.



## Forestry

When hauling logs up steep slopes using a tower yarder with a skyline carriage, you need high torque brakes that can hold tension on the cables. PT Tech's expertise and proven history of providing solutions for the toughest braking conditions is just what you need. Look at our NBE and MCB brakes as examples of products that can be configured to meet your needs.



## Agriculture

For many years, TCP torsional couplings have been found on the market leading tractors and harvesters. From fruit and nut trees to grapes in the vineyard, PT Tech's products are used on shredders for decomposing prunings. Additionally, they can be used for pull-behind or autonomous orchard sprayers for treating trees and grapevines for disease, insect, and weed control. Our line of HPTO dry clutches and torque limiters are utilized in other agriculture products.

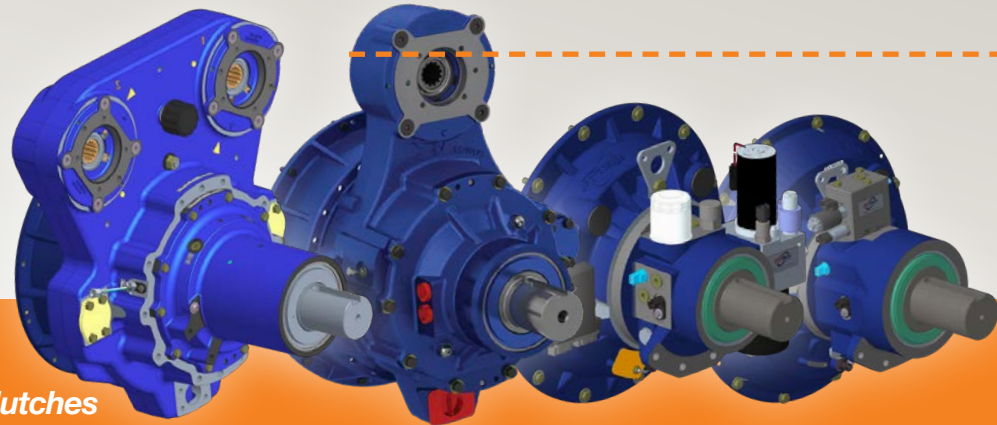


## Wind

PT Tech's experience in Wind goes back to the early 1990's as we developed custom OE solutions for difficult drivetrain issues in wind turbines. Beginning in 2011, PT Tech began doing field research into the unusual transient loads that occur in these drivetrains. Wind turbines are different than most other systems. The bedplates/frames are highly flexible compared to most industrial drivetrains and are mounted on towers.

# Our Products

Quality that Counts



## HPTO®

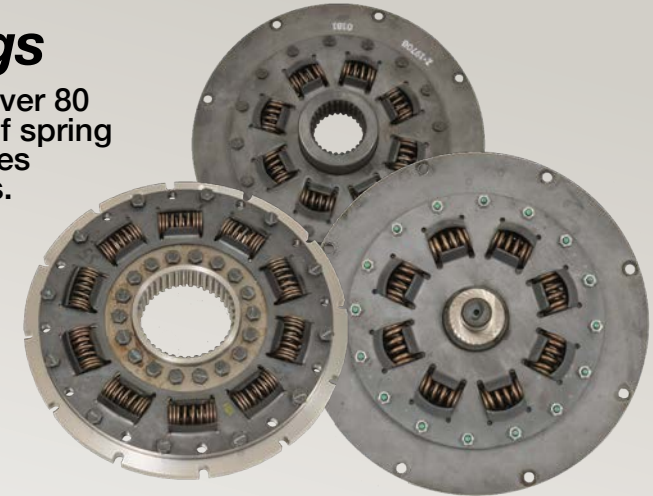
### Hydraulic Power Take Off Clutches

Since 1998, PT Tech's complete line of HPTO clutches have been used around the globe on the world's most extreme machines, such as: Wood Waste Recycling Grinder and Chippers, Rock Crushing Equipment, Marine Propulsion, Agricultural Equipment, etc. Our customers connect the HPTO to their diesel engine or electric motor to drive cutterheads, crushing plants (jaws, cones, and impactors), wood shredders, orchard sprayers, mud pumps, etc.

The HPTO clutches are offered in either a dry disc pack or wet disc pack configuration, and all include a hydraulic manifold assembly and a microprocessor clutch controller for push-button (or J1939 CANbus) engagement of the clutch. Your machine's controls can communicate directly with our clutch controller.

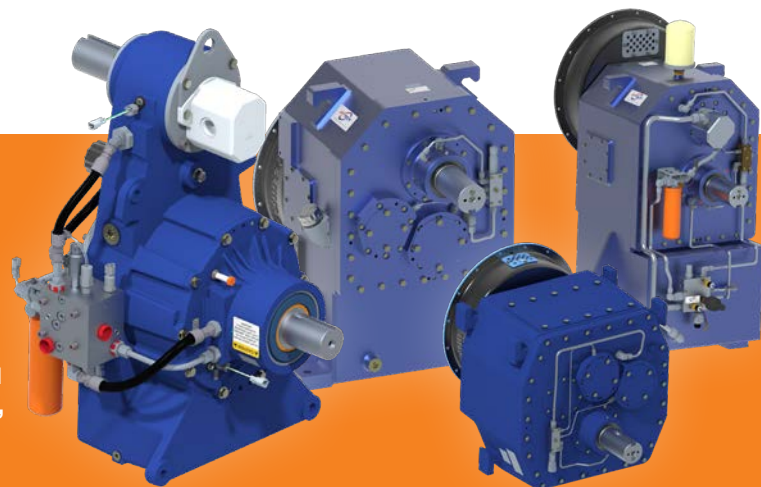
## TCP Torsional Spring Couplings

Spring couplings have been a part of powertrains for over 80 years. Torsion Control Products has developed a line of spring couplings, torque limiters, and torque converter clutches specifically for Tier III and Tier IV engine configurations. These products address the torsional characteristics unique to the Tier upgrades that produce more power in smaller packages at lower operating speeds. Through the evaluation of many different applications using Torsional Vibration Analysis, our engineers have created products that address the needs of most applications.



## Enclosed Brakes

Since the 1980's, PT Tech has been providing braking solutions to a wide variety of OE equipment. From underground and above ground mining, to steel mill cranes and marine applications, PT Tech's experience allows you to gain the best performance and safety in your equipment. Whether you need holding brakes, dynamic brakes, emergency brakes or a combination, our solutions include: Caliper Disc Brakes



## Gearboxes

PT Tech is known our markets for our custom gearboxes, going up to 1000 Hp (746 kilowatt). As a trusted solutions provider, PT Tech has experience in many different forms of drivetrains. Whether you need diesel driven, motor driven or hybrid, PT Tech can engineer the optimal solution for your equipment.

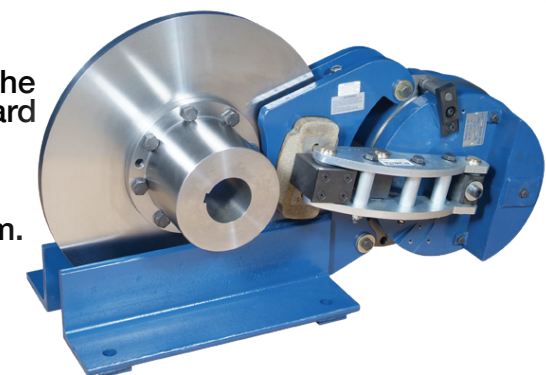


## Torque Limiters/Couplings

PT Tech's continuously engaged friction torque limiters require no resetting. Color coded spring cups provide visual identification of the torque setting and are torque tamper-proof. Our torque limiters offer high torque accuracy for the lifetime of the clutch, providing high levels of uptime and safety for your equipment.

## Caliper Disc Brakes

Conveyer Braking Packages are each unique based upon the project. The elements involved are common (calipers, disc, hydraulic, etc.). The most significant functional difference is in the controls. Standard Units use an Open Loop System. In a standard system, stopping time is set to a calculated amount of time. The actual stopping time depends on the conveyor's belt load. Braking time can be adjusted by changing an adjustable orifice within the hydraulic unit. Smart Units use a Closed Loop System. The brake system's Programmable Logic Controller (PLC) is programmed with a Proportional Integral Derivative (PID) loop that establishes the rate of deceleration (slope) and regulates a proportional control valve. Stopping time is consistent regardless of the conveyor's belt load.



# Our Approach

Empowering Our People, So they can Empower You!



## From Custom Engineering to Rebuilding

### Custom Engineering

We have industry leading R&D Testing capabilities, equipment, and know-how. Our Engineering Department can perform a myriad of tests to ensure our solutions meet your design performance expectations including, Servo Hydraulic Load Frame Testing, Friction Material Testing, Live and Still Thermal Imaging, Vibration Testing, Radial & Axial Bearing Load Testing, and much more! PT Tech has a long history of “being the solution” for our customer’s most challenging engineering needs.

### Custom Products

Working as an extension of your engineering teams, PT Tech has a long history of creating solutions to your most difficult problems. Our solutions that we have provided for our OEMs include Gearboxes, large carbon ceramic face seals, stamping brakes and more! Let us work with your engineering teams to solve your problems.

### Service

As a part of the Timken team, PT Tech’s customers have great support worldwide. From strategic partners in Australia, Brazil and South Africa to the PT Tech team in the US and Europe, we now have additional support from the global Timken Service Engineering team. Contact PT Tech today to determine the best way we can support your needs.

### Certified Rebuilds

- Complete teardown, rebuild and certification testing available on all PT Tech products.

### Field Service

- 24 hour response time to the field with product expert trained technicians.

For an innovative solution outside our standard product offerings, look to PT Tech’s experts to help serve as an extension of your engineering department. We have the technology to solve virtually any design challenge with engineering tools such as:

- 3D Solid Modeling
- Failure Effects Analysis Software
- Shockload Analysis Software
- High Speed Data Acquisition



### Testing Capabilities

- Servo-hydraulic load-frame
- Torque/Energy testing
- Dynamometer
- High-speed video
- Infrared temperature video
- And More!

## Empowering Our People

TCP and PT Tech have a history of employing the top market experts so we can provide our customers with the best quality products and services. Our team of 20+ engineers who are always on call to help find the solutions to any and every one of your problems. Our team of technical sellers work with your engineering teams to define your needs and bring in our drivetrain experts to optimize your drivetrain design. Whether you need torsional damping or new brakes, we have off the shelf or custom designs to meet your needs.

We empower our people to be problem solvers, encouraging creativity and development. Our engineering teams focus on robust engineering practices and quality. We want to be your partner in solving your most difficult problems.



### The Timken Company

For more than 120 years, Timken has applied our innovative problem solving to the most challenging applications worldwide. We are extending that same critical thinking and leadership to the way we view our responsibility as a global corporate citizen.

We are globally recognized as the authority in friction management, power transmission and metallurgy and partner with a broad range of global customers. Our deep vertical industry

knowledge and vast experience across markets and geographies inform how we innovate and solve problems for the most challenging applications worldwide.

Our work is integral to keeping global industry in motion. We advance industries through our growing portfolio of products and services, helping to power renewable energy sources, move transportation forward efficiently and enable safe and secure food production.



Engineered Marine Solutions





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