Brochure

Mechanical power transmission
Product overview

DODGE®

Power and productivity
for a better world™

ABB

With expertise, and a comprehensive portfolio of products and life-cycle services, we help value-minded industrial customers improve their energy efficiency and productivity.

Mechanical power transmission
Product overview – Contents

Mechanical power transmission
Product overview – Dodge® product overview

ABB offers a total power transmission solution

For more than 135 years Dodge mechanical power transmission products have handled the toughest applications, providing the lowest total cost of ownership to both OEM's and end users. This complete line of products, including mounted bearings, enclosed gearing, couplings, pulleys and other PT components, are engineered and manufactured to perform reliably with less maintenance.

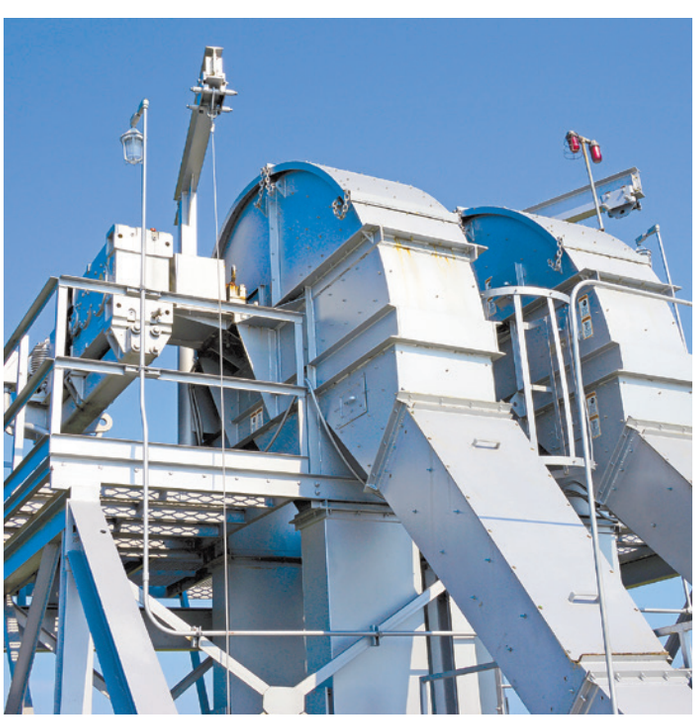
Dodge products feature industry leading patented sealing technology that provides extended life in both harsh duty and sanitary washdown applications. Unique mounting systems also make Dodge products easy to install and remove, without shaft damage.

Decades of experience applying our products throughout a wide range of industries means we understand the issues that impact productivity and can offer valuable expertise to help improve output and enhance system value.

With System-1™ we offer an integrated single source for all of your mechanical and electrical needs. Our capability to package and pre-assemble products means we provide a complete system solution, with optimized product selection, one invoice and warranty, and a single point of contact.

And for larger projects, System-1 specializes in customized bulk material handling conveyor drive solutions, combining design engineering skills with in-depth industry and product knowledge, to deliver packaged solutions for projects in the mining, aggregate, cement, and grain industries.

Only Dodge products offer a total mechanical power transmission solution:
– Rugged and reliable service
– Easy installation and removal
– Easy maintenance
– Extremely long product life
– Maximum process up-time
– Lower total cost of ownership



Mechanical power transmission
Product overview – Mounted bearings

Mounted roller bearings

Industry's leading producers trust Dodge® mounted roller bearings to handle their conveyance and power transmission needs on a daily basis. Throughout the years, Dodge mounted roller bearings have earned the reputation for reliability and ease of maintenance and are recognized as the highest quality mounted bearings in the industry.

Today, our bearings feature innovative designs; including sealing options that protect the bearings from contamination that can cause failures, and a patented easy-on, easy-off adapter mounting and removal system that provides a concentric grip for superior holding on the shaft.

Key industries:
- Grain handling
- Aggregate / cement
- Mining / metals
- Air handling
- Forest / paper
- Power generation
- Water / wastewater
- Sugar

ISN spherical roller bearings

Product description	A mounted spherical roller bearing with metric mounting dimensions that is dimensionally interchangeable with SN style housings
Cast iron two-bolt plummer block bore sizes	30 to 140 mm
Ductile iron four-bolt plummer block bore sizes	150 to 170 mm
Product features	Patented easy-on, easy-off adapter mounting and removal system Trident triple lip and labyrinth seal options One piece, factory greased, out-of-the-box ready to install Full concentric shaft attachment with adaptor sleeve mount

ISNX hydraulic spherical roller bearings

Product description	A mounted spherical roller bearing with a built-in hydraulic mount and dismount system that is dimensionally interchangeable with SC 3100 style products
Ductile iron housing bore sizes	150 mm to 360 mm
Product features	Sealed inner unit protects bearing from contamination Combination triple-lip and auxiliary sealing system

IP spherical roller bearings

Product description	A mounted spherical roller bearing with inch mounting dimensions along with metric bore sizes
Available styles	2-bolt and 4-bolt pillow blocks, flanges, and take-ups
Product features	Patented easy-on, easy-off adapter mounting and removal system Available with Trident triple lip and labyrinth seal options Full concentric shaft attachment with adaptor sleeve mount Shaft-ready out of the box

Mechanical power transmission
Product overview – Mounted bearings

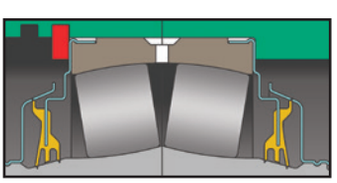
Type E-Xtra® tapered roller bearings

Product description	A mounted spherical roller bearing with tapered rolling elements
Bore sizes	35 mm to 180 mm
Product features	Completely assembled, factory adjusted, and properly lubricated – shaft ready XTS triple-lip seal Extra protection – E-Tect seal option

SNX/SDX spherical roller bearings

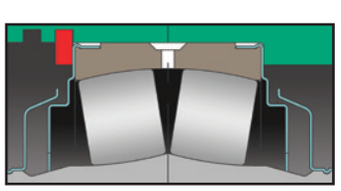
Product description	A mounted spherical roller bearing that matches industry standard SN and SD mounting dimensions
Available series	22200, 22300, 23000, 23100
Product description	Multiple seal options Grease or oil lubrication

Trident seals



For dirty environments, low-to-medium speeds, and normal ambient conditions, these inserts feature our proven Trident seal. Made of nitrile material, this triple-lip rubbing seal assures a low coefficient of friction, and its seal land maintains full seal contact when misaligned.

Labyrinth Seals



For higher speeds and temperatures, the inserts offer labyrinth seals with corrosion-resistant flingers and a clearance steel seal carrier.

Mechanical power transmission
Product overview – Mounted bearings

Mounted ball bearings

When it comes to reliable performance and low maintenance, Dodge® mounted ball bearings are unmatched in the industry. These bearings have been engineered with an array of innovative patented features that provide extended life in the toughest applications, including those found in the food and beverage industry.

Dodge mounted ball bearings are available in any of our proven locking devices; our exclusive 65° set screw locking system, eccentric locking collars, D-Lok concentric clamp locking system, and our patented Grip Tight® adapter mounted ball bearing.

Key Industries:

- Food / beverage / pharmaceutical
- HVAC / air handling
- Forest / paper
- Unit / baggage handling
- Aggregate / cement

Set screw ball bearings

Product description	A mounted ball bearing with a 65° set screw angle for greater holding power and ease of installation in confined areas
Sizes	17 mm to 85 mm (1/2" to 3-1/2")
Features	DualGuard™ seal – comprised of single lip seal and rubberized flinger – standard on all SC, SCM ball bearings. Interchangeable mounting dimensions with most competitive products Plus or minus 2° static misalignment
Available options	High-temperature to 204°C (400°F) on SC and SCM LL Lo Torque Labyrinth seals Expansion pillow blocks available for popular shaft sizes Snap-on end covers

Extreme duty ball bearings

Product description	A mounted ball bearing with an enhanced sealing system for extreme applications
Bore sizes for SC	20 to 75 mm (3/4 to 2-15/16")
Bore sizes for SCM	25 to 85 mm (1 to 3-1/2")
Features	QuadGuard™ triple-lip seal with rubberized flinger Maxlife cage that extends grease life Standard synthetic grease – Mobilith SHC 220 PM 65° set screw Snap-on end covers

Mechanical power transmission
Product overview – Mounted bearings

Grip Tight ball bearings

Product description	A mounted ball bearing with a thin wall adapter mounting system that offers 360° full shaft contact and concentricity with no shaft marring or fretting corrosion
Bore sizes	17 mm to 85 mm (1/2” to 3-1/2”)
Features	Integral dismount feature easily removes the bearing from the shaft DualGuard™ seal – comprised of single lip seal and rubberized flinger – standard on all GT, GTM ball bearings Interchangeable mounting dimensions with most competitive set screw, eccentric collar, and concentric clamp collar products Snap-on end covers Does not require turned, ground, and polished shafting
Available options	LL Lo Torque Labyrinth seals Expansion pillow blocks available for popular shaft sizes High-temperature available to 204°C (400°F)

Ultra Kleen® washdown ball bearings

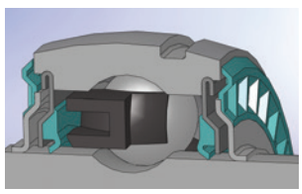
Product description	A mounted ball bearing with either a reinforced polymer or stainless steel housing with a 440C stainless steel insert
Bore sizes	20 to 50 mm (3/4 to 2”)
Features	65° set screw QuadGuard™ triple-lip seal with rubberized flinger Maxlife™ cage that extends grease life Stainless balls Snap-on end-covers

E-Z Kleen® corrosion resistant ball bearings

Product description	A mounted ball bearing with either a reinforced polymer or a stainless steel housing with a corrosion resistant, coated insert
Bore sizes	20 mm to 50 mm (3/4” to 2”)
Available locking devices	65° set screw angle (SC), concentric clamp collar (D-Lok), and Grip Tight adapter mount
Features	Patented polymer housing includes anti-microbial agent which resists bacterial and fungus growth QuadGuard triple lip seal with rubberized flinger Maxlife cage that extends grease life Interchangeable mounting dimensions with most competitive products Snap-on end-covers

Mechanical power transmission
Product overview – Mounted bearings

DualGuard seal

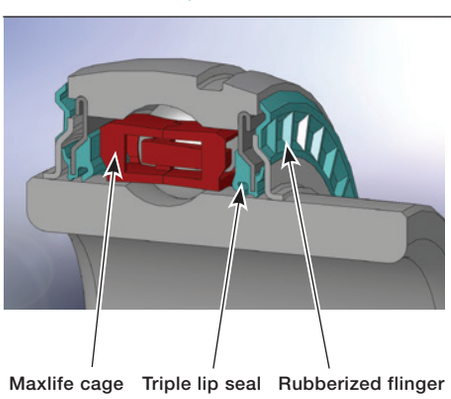


Comprised of single lip seal and rubberized flinger that is included on all standard duty ball bearings
LL Lo Torque Labyrinth seals optional

Snap-on end covers

Common Dodge housing configurations, including Ultra Kleen and E-Z Kleen, are machined with a groove to accept snap-on style polymer end covers that are durable and easy to install. They also include a drain hole to prevent moisture from collecting inside the cover, and help provide positive sealing in wet environments.

Patented QuadGuard seal



This patented triple-lip seal provides three points of contact to keep contaminants out and keep grease in. Rubberized flingers provide external protection, discarding contaminants as it rotates. Molded baffles in the flinger act like a paddle wheel to help deflect liquids.

Maxlife cage

This two-piece design creates compartments that keep grease in close contact to balls, and help to prevent grease from being washed out during high pressue cleaning.

Mechanical power transmission
Product overview – Mounted bearings

Mounted plain bearings

Dodge® offers a wide variety of plain bearings that are uniquely engineered to provide reliable performance – even in the harshest environments. These bearings are ideal for high temperature applications typically found in air handling, high temperature, and waste water, and feature patented technologies that reduce maintenance and ensure long service life.

Numerous designs allow you to select the best bearing style for any application – from a simple Solidlube® bearing to a Sleevoil® hydrodynamic water cooled bearing. Housings are drilled and tapped to accept temperature, vibration and speed monitoring devices.

Key industries:
- Power generation
- Cement
- Wood products
- Aggregate
- Sugar
- Mining / metals
- Air handling
- Food / beverage / pharmaceutical

Sleevoil RTL series hydrodynamic pillow block bearings

Product description	A base mounted hydrodynamic oil film bearing that utilizes a water cooled design to provide long life in continuous running industrial fan applications
Bore sizes	3 7/16" to 12" shaft diameter
Product features	Extended life (no metal-to-metal contact during operation) Handles moderate to high speeds Dampens vibration, provides quiet operation Fully split for ease of maintenance Self-aligning
Available options	External cooling (air, water, or oil) for hot shafts or high temperatures RTD's heater/thermostat combo, circulating oil systems, auxiliary seal kits and isolators

Sleevoil R series hydrodynamic pillow block bearings

Product description	A replacement for legacy units in existing applications, this base mounted hydrodynamic oil film bearing utilizes water cooled design that provides long life in continuous industrial fan applications.
Bore sizes	1 7/16" to 14" shaft diameter
Product features	Extended life (no metal-to-metal contact during operation Handles moderate to high speeds Dampens vibration, provides quiet operation Fully split for ease of maintenance Self-aligning
Available options	External cooling (air, water, or oil) for hot shafts RTD's, heater/thermostat combo, circulating oil systems, auxiliary seal kits and isolators

Solidlube sleeve bearings

Product description	A carbon-graphite bearing used in high temperature damper and oven applications where lubrication is critical
Bore sizes	3/4" to 3" (20 mm to 75 mm)
Housing types	2-bolt pillow blocks, 4-bolt and 2-bolt flange units
Product features	Functions in harsh environments where ball bearings will not Self-lubricating, statically self-aligning Covers a wide range of temperature extremes 700 Series: -40°C to 370°C (-40°F to 700°F) 1000 Series: -128°C to -40°C (-200°F to -40°F) and 120°C to 537°C (250°F to 1000°F) Ideal where bearings are subject to dry cycles or where lube systems would be too costly

Mechanical power transmission
Product overview – Gearing

Motorized Torque-Arm® II and Torque-Arm® II shaft mount reducers

This powerful line of shaft mounted reducers deliver industry leading performance in some of the most demanding applications. These reducers are engineered for reliability and feature patented innovations, like premium sealing systems, that provide customers maximum up-time with less maintenance.

Both gear reducers feature the patented Dodge® twin-tapered bushing system that not only makes installation and removal easy, but also provides a sturdy, concentric grip of the driven shaft on both sides of the reducer. This eliminates the wobble and fretting corrosion associated with straight bore and single bushed reducers. Available in full length and short shaft systems, both guarantee maximum torque transmission.

Both Motorized Torque-Arm II and Torque-Arm II are third party ATEX certified and comply with the Essential Health and Safety Requirements that relate to the design of Category 2 and M2 equipment, which is intended for use in potentially explosive atmospheres. These Essential Health and Safety Requirements are given in Annex II to European Union Directive 94/9/EC of 23 March 1994.

Key industries:

- Grain / food
- Aggregate / cement
- Mining / metals
- Power generation
- Waste water

Motorized Torque-Arm II shaft mount reducers (MTA)

Product description	A heavy-duty right angle beltless direct drive solution
Case sizes	7 sizes from 1,5 to 75 kW (3 hp to 100 hp) based on output speeds
Torque range	Up to 14,700 Nm (130,000 in-lbs)
Certifications	Third party ATEX certified
Product features	Twin-tapered bushing bores from 35 mm to 120 mm (4-7/16”) Rugged, high efficiency, case carburized helical/bevel gearing Heavy-duty tapered roller bearings throughout, no ball bearings Straddle mount input pinion provides maximum torque throughput Standard IEC B5 Flange adapter or NEMA C-face motors Heavy-duty lip seals for extended wear life and -40°C to +150°C (-40°F to +300°F) temperature ranges Metal excluder shield sealing system with rubber contact lip
Capabilities and mounting	Compact space saving design Can be mounted in multiple positions Available as motorized screw conveyor drive with adapter and drive shaft

Mechanical power transmission
Product overview – Gearing

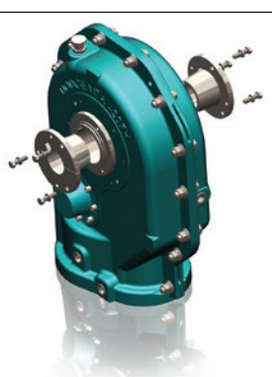
Torque-Arm II shaft mount reducers

Product description	A heavy-duty belt driven solution
Case sizes	12 sizes through 300 kW (400 hp)
Torque range	Up to 36,700 Nm (325,000 in-lbs)
Certifications	Third party ATEX certified
Product features	Twin-tapered bushing bore sizes from 25 mm to 160 mm (1” to 7”) Rugged cast-iron housing Highly efficient helical gearing Heavy-duty tapered roller bearings throughout, no ball bearings Heavy-duty seals for extended wear life and -40°C to +150°C (40°F to +300°F) temperature range Metal excluder shield sealing system with rubber contact lip 100% factory noise and leak tested Can be mounted in multiple positions including, shaft mounted, screw conveyor, vertical and flange mounted Can be mounted in multiple positions Available as motorized screw conveyor drive with adapter and drive shaft

Torque Arm II modular concept

Modular motor mount is attached and supported by two angle iron brackets with equally spaced holes, which align with the spacing of the cast slots of the gear case. This way, the motor mount can be adjusted up or down, depending on the customer’s requirements. It can also be mounted on the side of the reducer for screw conveyor applications.

Dodge twin tapered and short shaft bushing options



Dodge twin-tapered bushing option	Provides easy installation and removal of reducer from shaft System features fully split, ductile iron, 8° taper bushings Provides sturdy, concentric grip on the driven shaft on both sides of the reducer Eliminates the wobble and fretting corrosion associated with straight bore and single bushed reducers Full length key guarantees maximum torque transmission Installation and removal methods require no special tools
Dodge short shaft twin-tapered bushing option	Allows replacement of straight bore or single bushed reducers Full length key guarantees maximum torque transmission Extended outboard bushing reaches in and grabs the shorter shaft

Mechanical power transmission
Product overview – Gearing

Modular accessories

Backstop and Tie rod kit

Backstop option helps prevent reverse rotation in high stop-start loads, and results in less wear and longer life. Its centrifugal throw-out design eliminates sprag sliding and reduces wear. It operates with standard and EP lubricants and requires no external lubrication.

Includes standard brackets, functions as a belt-tensioning device, and offers universal mounting options

CEMA bolt-on adapter

Features double-lip seals on both surfaces. The adapter center is open for contaminate drop out for optimized sealing.

Adjustable packaging kit and screw conveyor drive shafts

Bolts to the standard adapter and provides a proven sealing option for hostile environments

Made from high alloy steel and engineered to CEMA dimensions. They are three-bolt drilled and their tapered fit ensures simple installation. The rugged locking plate (patent pending) also provides a mechanical shaft removal feature.

Bolt-on belt guard package (Torque-Arm II only)

Requiring no drilling or straps, it allows multiple height adjustments, features a lift-off cover construction, and has an open metal inspection feature.

Mechanical power transmission
Product overview – Gearing

MagnaGear XTR®

Dodge® MagnaGear XTR is a simple, power-dense reducer that offers increased reliability in a compact, heavy-duty package. Engineered with proven planetary and helical gear technology, this reducer is ideally suited for a variety of high torque applications.

With the reducer's standard, premium quality, tandem sealing system and cooling system, you can always depend on low-maintenance operation and maximum value for your money.

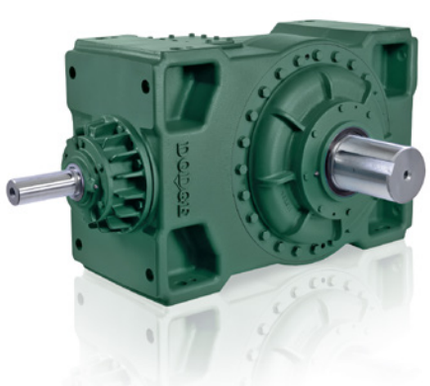
Hollow shaft reducers, G390 and below, feature the Dodge patented twin-tapered bushing system that not only makes installation and removal easy, but also provides a sturdy, concentric grip of the driven shaft on both sides of the reducer. This eliminates the wobble and fretting corrosion associated with straight bore and single bushed reducers, and ensures maximum torque transmission.

MagnaGear XTR reducers are ideal for rugged environments and, with their universal housing, they can be configured and mounted to suit your application.

Key industries:

- Mining
- Grain handling
- Sugar
- Aggregate / cement
- Power generation
- Paper and forest products

MagnaGear XTR



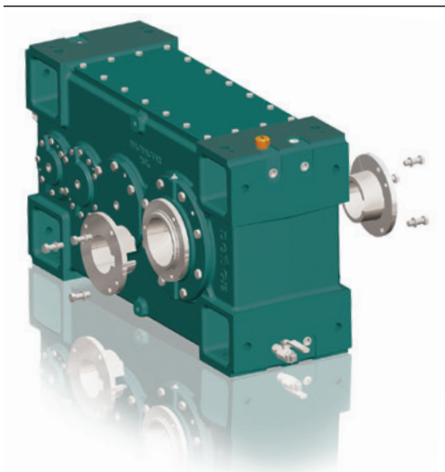
Product description	A heavy-duty, power dense, high torque reducer
Case sizes	11 sizes from 18.5 to 5,400 kW (25 to 7,200 hp)
Torque range	From 11,300 to 395,000 Nm (100,000 to 3,500,000 lb-in)
Available configurations	Parallel shaft or right angle
Available output	Solid or hollow shaft
Product features	Rugged cast iron housings Gearing is carburized, hardened, and precision ground Premium tandem taconite seal system is standard with the oil seal protected by a contact excluder lip seal and grease cavity All bearings exceed best in class standards for L10 life Can be used with a variety of soft start mechanisms including VFD and fluid couplings
Capabilities and mounting	Modular design for reversibility and multiple mounting configurations, minimizing spare requirements 4-sided mounting configurations Base and swing base mountings Tunnel housings Proven planetary design is utilized in sizes over 44,000 Nm (390,000 lb-in) to provide a compact, durable, light weight, economic solution for high torque applications
Engineered options	Internal lift-off style backstops Shaft and electric fans Torque arms Tunnel drive alignment free configurations Baseplates Inching drives

Mechanical power transmission
Product overview – Gearing

DM moment couplings

- Designed for shaft mounting MagnaGear XTR drive systems
- Specifically designed to make the rigid connection between the output shaft of a gearbox and driven equipment
- Male and female hubs manufactured from 4140 alloy steel
- Engineered to meet the most rigorous application requirements
- Capable of handling both the required application toque and the bending moment forces of the suspended weight of a drive package, including the gearbox, motor, high-speed couplings, and swing base
- Allows for alignment-free drive by eliminating the time consuming process of aligning the gearbox assembly to the head pulley shaft
- Quickly disconnect large drive packages for maintenance purposes

Dodge twin-tapered bushing option



- Provides easy installation and removal of reducer from shaft
- Provides sturdy, concentric grip on the driven shaft on both sides of the reducer
- Eliminates the wobble and fretting corrosion associated with straight bore and single bushed reducers
- Full length key guarantees maximum torque transmission
- Installation and removal methods require no special tools
- Available for sizes G390 and below

Parallel				
MagnaGear XTR model	Nm	kW rating range	Hp	Gear ratio
G100	11,520	30 to 180	45 to 295	8:1 to 63:1
G150	18,530	40 to 290	65 to 465	8:1 to 63:1
G210	25,420	60 to 400	100 to 645	8:1 to 63:1
G285	34,575	85 to 585	140 to 940	8:1 to 63:1
G390	48,470	120 to 795	195 to 1280	8:1 to 63:1
G525	63,160	350 to 1000	565 to 1545	8:1 to 28:1
G700	82,480	455 to 1390	735 to 2135	8:1 to 28:1
G920	108,465	610 to 1810	980 to 2850	8:1 to 28:1
G1400	155,810	620 to 1875	995 to 3015	12:1 to 38:1
G2100	240,880	1055 to 2750	1695 to 4425	12:1 to 35:1
G3500	389,800	1610 to 4590	2595 to 7390	12:1 to 38:1

Right Angle				
MagnaGear XTR model	Nm	kW rating range	Hp	Gear ratio
G100	11,410	30 to 125	45 to 199	12:1 to 63:1
G150	18,420	45 to 200	75 to 315	12:1 to 63:1
G210	25,310	60 to 275	100 to 440	12:1 to 63:1
G285	35,360	85 to 350	140 to 565	12:1 to 63:1
G390	44,520	105 to 415	175 to 665	12:1 to 63:1
G525	67,340	165 to 655	265 to 1015	12:1 to 63:1
G700	87,900	215 to 900	345 to 1385	12:1 to 63:1
G920	115,700	285 to 1145	460- 1765	12:1 to 63:1
G1400	158,920	390 to 1670	630 to 2685	12:1 to 63:1
G2100	245,700	585 to 2500	940 to 4025	12:1 to 63:1
G3500	397,600	1305 to 4180	1565 to 6725	12:1 to 63:1

Approximate power ratings at 1.0 SF

Assumes 1750 RPM for Hp ratings and 1450 RPM for kW ratings

Mechanical power transmission
Product overview – Gearing

Controlled Start Transmission (CST®)

With Dodge® CST drives, you get consistent, controlled starts and stops with enough power to drive the largest and longest conveyors. The CST is a 2 in 1 gearbox that combines a planetary gear reducer with an integral wet clutch system. When coupled to an AC induction motor the CST gearbox converts the motors high-speed, low-torque input to a low-speed, high-torque output, delivering total control of even the most heavily loaded conveyors.

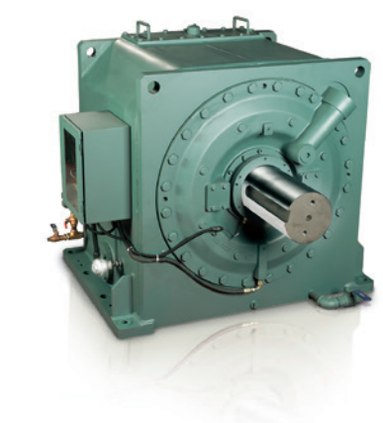
Because the CST provides efficient transmission of motor power and torque with consistent smooth start-up and shut-down, belt shock waves are eliminated, extending conveyor belt life. This also reduces the need for maintenance on other system components like couplings, bearings, belt idlers, shafts and pulleys.

The rugged construction and simplicity of a mechanical soft start and load sharing drive make the CST an ideal choice in bulk material handling applications where reliability and high availability is a must.

Key industries:

- Long overland conveying
- Mining
- Ports
- Aggregate
- Cement

Dodge CST



System features	
	Controlled acceleration and deceleration ramps
	Parabolic starting curves
	Adjustable acceleration times
	Deceleration (not braking) ramps
	Multiple starting duty
	Cooling system designed for repeated starts
	Drive motor may be left running between starts
System benefits	
Motor	Using a CST start system, the motor is at full speed prior to loading, therefore the full breakdown torque of the motor is available without a special motor design.
	No load starts
	Frequent motor starts eliminated
Power grid	Minimizes voltage drops via sequenced motor starts where multiple drives are utilized
	kW demand reduced by unloaded motor starts
Gearing	Protected from shocks by clutch mechanism
	Efficient planetary design
Conveyor components	Delivers optimal motor load sharing to minimize the loads and stresses on all conveyor components
	Hydro-viscous clutch located at output of the CST absorbs transient shocks
	Parabolic acceleration ramp minimizes belt and pulley stresses

Mechanical power transmission
Product overview – Gearing

The CST package

A complete engineered drive package can be supplied that will include:

- Dodge CST
- IEC or NEMA motor
- Drive base
- Dodge couplings
- Flywheels
- Dodge engineered class conveyor pulleys
- Dodge mounted bearings
- PLC control system

Models and specifications of Dodge CST drives

CST Model	Nm	kW rating range	Hp rating range	Gear Ratio
250K	28,000	120-270	160-365	16:1-35:1
280KR	32,000	90-300	150-400	15:1-57:1
420KR	48,000	135-350	215-565	16:1-57:1
H450K	51,000	250-475	350-650	17:1-34:1
H650K	73,000	350-700	465-925	16:1-40:1
G750K	85,000	350-875	550-1400	15:1-38:1
G750KR	85,000	340-875	540-1400	15:1-40:1
G1000K	113,000	475-1300	750-1500	12:1-38:1
G1000KR	113,000	320-1300	500-1500	12:1-57:1
G1500K	170,000	785-1930	1250-2550	12:1-34:1
G1500KR	170,000	480-1930	750-2550	12:1-57:1
2500K	282,000	1190-2200	1900-3000	17:1-38:1
G2500KR	282,000	800-2200	1300-3000	12:1-57:1

– Approximate power ratings at 1.4 SF
– Assumes 1780 RPM for hp ratings and 1480 RPM for kW ratings

Mechanical power transmission
Product overview – Gearing

Quantis®

The Dodge® Quantis product line offers a full line of modular gear drives engineered for flexibility, greater torque density in a compact housing configuration, and increased horsepower capability.

The Quantis family of products offers the customer three types of gear reducers: in-line helical (ILH), right angle helical bevel (RHB) and motorized shaft mount (MSM). All three types of reducers are dimensionally interchangeable with major global competitors, and are available with ATEX certification for hazardous environments.

Quantis RHB and MSM units feature the Dodge patented twin-tapered bushing system that not only makes installation and removal easy, but also provides a sturdy, concentric grip of the driven shaft on both sides of the reducer. This eliminates the wobble and fretting corrosion associated with straight bore and single bushed reducers. Available in full length and short shaft systems, both guarantee maximum torque transmission.

Key industries:
- Grain
- Food and beverage
- Package handling
- Forest / paper
- Mining
- HVAC / industrial air handling

Quantis in-line helical bevel (ILH)

Product description	An in-line helical product designed to achieve greater output torque ratings, increased horsepower ratings, expanded ratio range, and up to 98% efficient per stage, the Quantis ILH product line may allow the customer to downsize from existing units, resulting in a reduced product cost.
Sizes	38, 48, 68, 88, 108,128,148, and 168
Concentric sizes	38 to 128
Torque ratings	up to 14,000 Nm (122,000 lb-in)
Ratio	1.4 to 360:1
Input power	0.18 to 55 kW (0.25 hp to 75 hp)
Available options	Single, Double, Triple Reduction Choice of output flange: B5 and B14 Adjustable slide bases XT harsh duty output seal for wet and abrasive environments Scoop mount motor/reducer Multiple inputs: integral motor, separate input shaft, and two B5 flange options – clamp collar and 3-piece coupled

Mechanical power transmission
Product overview – Gearing

Quantis right-angle helical bevel (RHB)

Product description	The Quantis RHB product line features a helical-bevel gear train that offers cost-effective, high and low-speed solutions with efficiency ratings up to 94%.
Sizes	38, 48, 68, 88, 108, 128,148, and 168
Torque ratings	up to 13,500 Nm (119,000 lb-in)
Ratio	4:1 to 307:1
Input power	0.18 to 55 kW (0.25 to 75 hp)
Available options	Output flange: B5 or B14 Tie rod kit XT harsh duty output seal for wet and abrasive environments Twin Tapered bushings (standard and short shaft) Output: solid shaft, double shaft, straight hollow bore, shrink disk and tapered hollow in both metric and inch dimensions Input: integral motor, separate input shaft, and two B5 flange options – clamp collar and 3-piece coupled Screw conveyor drive

Quantis motorized shaft mount (MSM)

Product description	The Quantis motorized shaft mount (MSM) universal housing accommodates either footed or flanged configurationsn and is up to 98% efficient per stage.
Sizes	38, 48, 68, 88, 108, 128,148, and 168
Torque ratings	up to 13,500 Nm (119,000 lb-in)
Ratio	6:1 to 350:1
Input power	0.18 to 55 kW (0.25 to 73.76 hp)
Available options	XT harsh duty output seal for wet and harsh environments Torque-Arm bushing Output flange: B5 or B14 Twin Tapered bushings (standard and short shaft) Output: solid shaft, straight hollow bore, shrink disk and tapered hollow, in both inch and metric dimensions Input: integral motor, separate input shaft, and two B5 flange options – clamp collar and 3-piece coupled Screw conveyor drive

Mechanical power transmission
Product overview – Gearing

Quantis product capabilities

Quantis	Sizes	Output torque range		Ratio range	Input motor power range		Motor adapters
		Nm	lb-in		kW	Hp	
ILH	ILH 38 to 168	Up to 14000	Up to 122000	1.41:1 to 359:1	0.18 to 55	1/4 to 75	NEMA 56C to 360TC IEC 71D to 250D
MSM	MSM 38 to 168	Up to 13500	Up to 119000	6.65:1 to 350:1	0.18 to 55	1/4 to 75	NEMA 56C to 360TC IEC 71D to 250D
RHB	RHB 38 to 168	Up to 13500	Up to 119000	4.83:1 to 307:1	0.18 to 55	1/4 to 75	NEMA 56C to 360TC IEC 71D to 250D

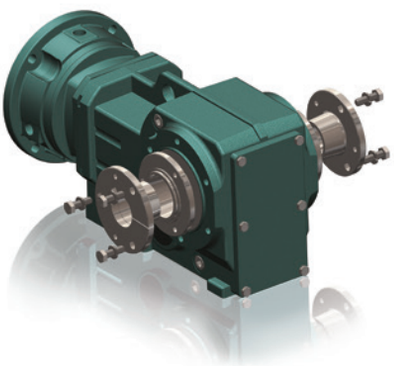
Quantis ATEX certification

Quantis ILH, RHB, and MSM size 38 and 48 reducers are suitable for ATEX Category 2, Group II and I, for gas and dust environments. The Quantis ILH, RHB, and MSM sizes 68-168 reducers are suitable for ATEX Category 2 and M2 (mining), Group II and I, for gas and dust environments. Quantis ILH, RHB and MSM reducers size 38-168 are suitable for ATEX Category 3 for all gas and dust environments within ignition temperatures higher than T4 (135 deg. C).

Reducer size	ATEX certification categories for Dodge Quantis reducers		**ILH**		**RHB**		**MSM**	
			Max ratings		Max ratings		Max ratings	
			Input power	Torque	Input power	Torque	Input power	Torque
			Hp (kW)	in-lbs (Nm)	Hp (kW)	In-Lbs (Nm)	Hp (kW)	In-Lbs (Nm)
38	ATEX Category 2 Group II and I, for gas and dust environments	ATEX Category 3 for all gas and dust environments with ignition temperatures higher than T4	8.87 (6.61)	1947 (220)	5.6 (4.18)	2213 (250)	7.45 (5.55)	2921 (330)
48			13.88 (10.35)	3983 (450)	9.9 (7.38)	3985 (450)	7.7 (5.74)	4780 (540)
68	ATEX Category 2 and M2 (mining), Group II and I, for gas and dust environments		26.64 (19.86)	7081(800)	13.88 (10.35)	7262 (821)	26.92 (20.07)	8851 (1000)
88			45.45 (33.89)	14870 (1680)	26.94 (20.09)	11638 (1315)	45.47 (33.90)	16817 (16817)
108			92.12 (68.68)	27438 (3100)	45.36 (33.82)	22430 (2534)	74.16 (55.29)	30093 (3400)
128			135.98 (101.39)	45140 (5101)	92.65 (69.08)	41623 (4703)	133.21 (99.32)	53991 (6101)
148			144.74 (107.92)	70808 (8001)	136.15 (101.51)	70848 (8005)	144.74 (144.74)	77004 (8701)
168			158.68 (118.31)	123914 (14002)	120.91 (90.15)	104886 (11852)	158.78 (118.39)	118603 (13401)

Mechanical power transmission
Product overview – Gearing

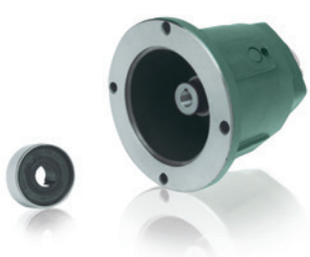
Dodge twin-tapered and short shaft bushing options



Dodge twin-tapered bushing option	Provides easy installation and removal of reducer from shaft
	Available for RHB and MSM styles
	System features fully split, ductile iron, 8° taper bushings
	Provides study, concentric grip on the driven shaft on both sides of the reducer
	Eliminates the wobble and fretting corrosion associated with straight bore and single bushed reducers
	Full length key guarantees maximum torque transmission
	Installation and removal methods require no special tools
Dodge short shaft bushing option	Allows replacement of straight bore or single bushed reducers
	Full length key guarantees maximum torque transmission
	Extended outboard bushing reaches in and grabs the shorter shaft

Quantis accessories

Backstop



The backstop option helps prevent reverse rotation in high stop-start loads, and results in less wear and longer life. It's centrifugal throw out design eliminates sprag sliding and reduces wear. It operates with standard and EP lubricants and requires no external lubrication, and is designed for use with three piece coupling and separate inputs. (Offered in units built in U.S. only.)

XT-Harsh duty output seal

The rubber coated nitrile output seal consists of 2 parts; the inner sleeve and outer sleeve. The vertical flange of the inner sleeve protects the lip from high pressure washdown spray and the outer sleeve holds the actual lip. Two additional dirt excluder lips help to fling dirt away and provide a labyrinth.

Mechanical power transmission
Product overview – Couplings

Couplings

Uniquely engineered to dampen vibration, accommodate shaft misalignment, and eliminate unexpected downtime. Dodge® has manufactured couplings for over 100 years, earning a reputation for developing innovative products that lower customers' total cost of ownership.

The Dodge coupling product line can offer a solution to almost any customer need. Whether the need is an elastomeric or metallic design, Dodge can provide a coupling with the potential to increase torque capacity, accommodate shaft misalignment, eliminate lubrication, extend life, improve operational efficiency, and put an end to unexpected downtime.

Combining Dodge coupling products with the overall ABB product lines, customers can order complete system packages containing a variety of designs, sizes, and options. Our large product offering allows pump, conveyor, and fan users to have a drive, motor, coupling, gearbox, bearings, and conveyor pulley from the same manufacturer. This ability to provide a single source system design with the product breadth and depth of Dodge is an advantage shared with no other manufacturer in the marketplace.

Key industries:

- Mining / metals
- Aggregate / cement
- Chemical / oil / gas
- Food
- Forest / paper
- HVAC / Industrial
- Unit / baggage handling
- Power generation
- Sugar

Para-Flex® coupling

Product description	A flange-mounted elastomeric tyre style coupling
Bore size	Up to 203 mm (8")
Torque range	Up to 51,180 Nm (453,000 lb-in)
Available elements	Natural rubber, neoprene, and cordless
Certification	Third-party ATEX certification standard
Product features	Industry leading misalignment 4° angular, 3.1 mm (1/8") parallel, and 7.8 mm (5/16") end float
	Industry leading 5-year warranty
	Taper-Lock®, ductile iron FBX finished bore, and steel BBS bored-to-size flanges
	"Problem Solver" element absorbs shock and dampens vibrations
	No maintenance- non-lubricated design assures trouble-free operation

Para-Flex® spacer coupling

Product description	A flange-mounted elastomeric tyre style coupling for extension between shaft end dimensions
Product features	Factory-assembled spacer center assembly
	Drops in and drops out for easy installation and removal
	Accommodates a wide range of between – shaft-end lengths for greater versatility

Mechanical power transmission
Product overview – Couplings

D-Flex® coupling

Product description	An elastomeric sleeve style coupling
Bore size	Up to 140 mm (6”)
Torque range	Up to 8189 Nm (72,480 lb-in)
Available types	Close-coupled and Type SC spacer designs
Available elements	EPDM, Neoprene, and Hytrel
Certification	Third-party ATEX certification standard
Product features	Four-way flexing action handles shock, vibration, and misalignment Simple design and interchangeable components make installation quick and easy Ionized powder coat finish for superior corrosion protection Quick, easy installation – no maintenance required AGMA 9 dynamically balanced Type S and SC flanges

D-Flex Type SC spacer coupling

Product description	An elastomeric sleeve style coupling for extension between shaft end dimensions
Product features	Shaft hubs include hub flats for ease of alignment during installation Features a drop-out center assembly for easy equipment maintenance Available in all common metric (ISO) and inch (ANSI) Flexible spacer design accommodates a wide range of customizable between shaft-end BSE dimensions AGMA 9 dynamically balanced flanges for reduced vibration

Grid-Lign® coupling

Product description	A flexible metallic lubricated tapered grid style coupling
Bore size	Standard range (1080T-1200T) accommodates up to 360 mm (13”) S-Series range through 555 mm (21.85")
Torque range	Standard range (1080T-1200T) 186,417 Nm (1,650,665 lb-in) S-Series range through 8,000,000 Nm (7,000,000 lb-in)
Available designs	T10/T80 close-coupled T35 half-spacer and T31 full spacer designs through size 1200T
Product features	Torque density and large bore capacities of a metallic coupling Misalignment and vibration camping capabilities of an elastomeric coupling Spacer designs can be used with brake discs or drums

Dodge Disc coupling

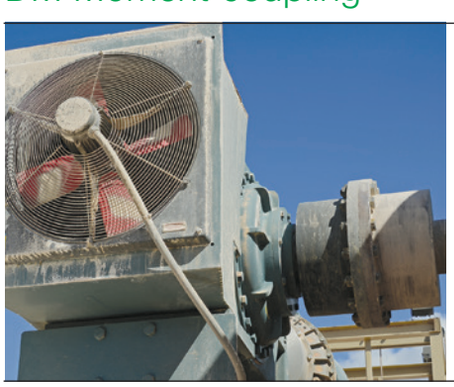
Product description	A flexible metallic non-lubricated disc style coupling
Bore size	Up to 385 mm (15.25”)
Torque range	Up to 258,904 Nm (2,292,000 lb-in)
Certification	Third-party ATEX certification standard
Product features	Unique dual-scalloped disc geometry allows for industry leading torque capacity and misalignment capabilities, resulting in longer life and improved reliability API 610 design standard, API 671 available upon request Large hub option offers increased bore capacities, allowing customers to save money by downsizing Non-lubricated design is maintenance free, increasing productivity

Mechanical power transmission
Product overview – Couplings

DGF Gear coupling

Product description	A flexible metallic lubricated gear style coupling
Bore size	Up to 1050 mm (42”)
Torque range	Up to 5,340,000 Nm (47,269,000 lb-in) torque
Available designs	Spacer, floating shaft, slide gear, and other customizable designs
Product features	Most power-dense metallic coupling available Crowned tooth profile for longer life Interchangeable with industry standard AGMA gear couplings through size 9 Customizable features allow for use in virtually any application

DM Moment coupling



Product description	A rigid metallic coupling for large gearbox applications
Bore size	Up to 385 mm (15”)
Torque range	Up to 237,268 Nm (2,100,000 lb-in)
Product features	Engineered to transmit torque and support the bending moment forces of an entire gearbox drive package Design reduces overall costs by allowing for an alignment free gearbox drive package Male and female piloted hubs manufactured from 4140 alloy steel Grade 8 bolts

Fluid coupling

Product description	A fluid filled mechanical soft start coupling
Available designs	Standard, single, and double delay fill
Available styles	Drive style (sheave), and coupling style (Para-Flex & Gear)
Product features	Mechanical soft start dampens shock load and reduces motor current draw Smooth, controlled acceleration with customizable startup torques Accommodates applications 1840 kW at 1450 rpm (1360 hp at 1750 rpm)

Mechanical power transmission
Product overview – Drive components

Drive components

Dodge® mechanical drive components affect and improve the way the world transfers power. Dodge synchronous drives not only connect one driven shaft to another, but they isolate shock load and vibration, correct minor misalignment, synchronize movement between shafts, with improved energy efficiency and performance.

Key industries:

- Grain
- Unit handling
- Forest and paper
- Food and beverage
- Air handling
- Mining
- Fluid handling
- Chemical / oil / gas
- Aggregate
- Cement
- Sugar

Benefits of synchronous drives vs v-belt drives

- 5% more energy efficient
- More torque with less belts
- Compact design
- Less maintenance
- Less belt pull
- Synchronous belts do not need to be re-tensioned after installation
- Features Taper-Lock® bushings that deliver more torque, require less shaft space, reduce bearing loads, and are easy to mount and dismount

HT500 synchronous belt drives

Available pitches	8 mm and 14 mm with various widths
Product features	98% efficient drive system Reduces overhung load and reduces belt pull by 10% or more compared to V-belts Features the modified curvilinear tooth profile for no-slip performance, increasing the contact of the belt tooth and sprocket, ensuring maximum power transmission Belt made of polyurethane with high-strength carbon fiber tension cords and a carbon black nylon tooth facing Belt can operate in temperatures up to 85°C and as low as -54°C Features made-to-order sprockets in cast iron, ductile iron, steel, stainless steel and aluminum construction, as well as zinc and nickel plating Mounting capabilities include Taper-Lock® bushings and finished bores

HT200 synchronous belt drives

Available pitches	8 mm and 14 mm with various widths
Product features	98% efficient drive system Reduces overhung load and reduces belt pull by 10% or more compared to V-belts Features the modified curvilinear tooth profile for no-slip performance, increasing the contact of the belt tooth and sprocket, ensuring maximum power transmission Belt made of polyurethane with high-strength carbon fiber tension cords and a carbon black nylon tooth facing Belt can operate in temperatures up to 85°C and as low as -54°C Features made-to-order sprockets in cast iron, ductile iron, steel, stainless steel and aluminum construction, as well as zinc and nickel plating Mounting capabilities include Taper-Lock® bushings and finished bores

Mechanical power transmission
Product overview – Drive components

Taper-Lock® bushings

Available sizes from stock	Up to 304 mm (12”) shaft diameter
Available materials	Sintered steel, cast iron, ductile iron, steel, and stainless steel
Product features	Easy to install and remove Delivers more torque Requires less shaft space Reduce bearing loads Engineered with an 8° taper Available in metric and inch bores

Idler brackets and bushings

Product features	Double adjustable bracket for maximum flexibility
	Positive ratchet locking between base and arm
	Idler bushings available in Taper-Lock®
	Use with stock products, such as: sheaves, and synchronous sprockets
	Compatible with products machined for Taper-Lock® 1610, 2012 and 2517 bushings

HT500 – Energy efficient, high torque belt drive system

The International Energy Agency’s paper on “Energy-Efficiency Policy Opportunities for Electric Motor-Driven Systems” advises to use synchronous belts as an improvement possibility for energy savings. The US Department of Energy also encourages the use of synchronous belts in all motor installations to maintain an overall efficiency rating of 98% across a wide load range. The HT500 Synchronous Belt is designed to offer the energy efficiency of a synchronous belt drive in a compact design.

HT500 55kW drive example

Motor kW=	**55**	**Energy price kWh**	**Electric Motor**	**Mechanical Drive System**	
Fixed kW load demand =	**38.4**	**€ 0,10**	**Efficiency 95.4%**	**V -belt**	**HT500**
Hours of operation x year	**6,000**			**Eff 93%**	**Eff 98%**
(1) Mechanical power out of driven sheave or sprocket				38.4	38.4
(2) Mechanical power into driver sheave or sprocket from the motor				41	39
% of rated load				75.1%	71.2%
(3) kW into motor				43	41
(4) kWh/year used				259,688	246,438
(5) Energy cost per year				€ 25.968,76	€ 24.643,82
(6) Savings					**€ 1.324,94**
Mechanical drive system eff =				93%	98%
Motor Efficency =				95.4%	95.4%
(7) Overall system Efficiency =				89%	93%
(Fixed kW load demand)/(Mtr Eff x V-belt Eff)*(Hrs of operation)*(Energy price kWh) =				€ 25.968,76	
(Fixed kW load demand)/(Mtr Eff x HT500 Eff) *(Hrs of operation)*(Energy price kWh) =					€ 24.643,82
Savings					**€ 1.324,94**

(1) = Fixed kW load demand

(2) = (motor‘s nominal kW) / (drive system efficiency) = Mechanical Power into driver sheave/sprocket from the motor

(3) = (Mechanical Power into driver sheave or sprocket) / (motor‘s efficiency) = kW into motor

(4) = (kW into motor) X (Hours of operation x year) = kWh/year

(5) = (Power cost per kWh/year) x (kWhy/year used) = Energy cost per year

(6) = Savings: the difference between the kWh cost using a V-belt drive vs a Synchronous drive

(7) = (Mechanical drive system efficiency)*(Motor‘s efficiency) = Overall system‘s efficiency

Additional Benefits from HT500

– No Maintenance Cost
– Zero slip
– Constant time, speed
– Positive engagement
– Less downtime

Mechanical power transmission
Product overview – CEMA and mine duty conveyor pulleys

CEMA and mine duty conveyor pulleys

Dodge® CEMA and mine duty conveyor pulleys have been operating in the world's most demanding material handling applications for over 100 years. An extensive rage of pulleys can be provided with high quality lagging designed to ensure maximum belt and pulley life in tough applications. With unmatched conveyor pulley engineering and manufacturing capabilities, Dodge pulleys deliver reliability worldwide.

Dodge CEMA and mine duty conveyor pulleys – Key industries

- Mining / metals
- Aggregate / cement
- Grain
- Sugar
- Power generation
- Forest products

Heavy duty drum pulleys

Available hub styles	HE or XT
Available lagging	Vulcanized lagging up to 25 mm thick in SBR, neoprene, or D-Lag rubber
Product features	Available from stock in over 150 different sizes and lagging types Exceeds CEMA application standards for use with conveyor belts rated up to 61 kN/m (350 PIW) Meets CEMA dimensions

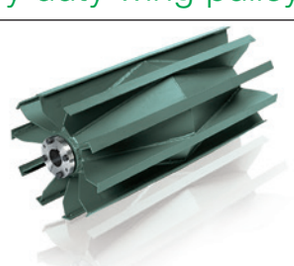
Mine duty extra drum pulleys

Available hub styles	Integral hub designs – HE or XT
Available lagging	Vulcanized or cold bonded ceramic lagging 12 mm, 16 mm, 19 mm, or 25 mm thickness
Product features	Available from stock in over 100 different sizes and lagging types Designed for use with conveyor belts rated up to 131 kN/m (750 PIW) Meets CEMA dimensions

Spiral drum pulleys

Available hub styles	HE or XT
Available construction	Heavy Duty, Mine Duty Extra, or custom
Product features	Designed for mine service tail pulley applications requiring rugged durability with maximum belt cleaning Crowned or straight face Meets CEMA dimensions

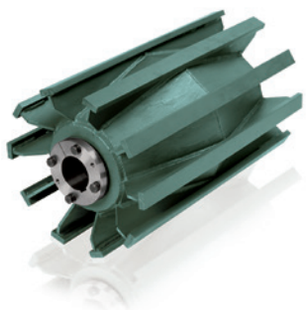
Heavy duty wing pulleys



Available hub styles	HE or XT
Product features	Minimum 6 mm x 38 mm contact bars Slide-on urethane Wing-Lag available Meets CEMA dimensions Meets CEMA dimensions

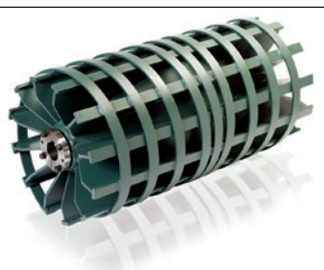
Mechanical power transmission
Product overview – CEMA and mine duty conveyor pulleys

Mine duty wing pulleys



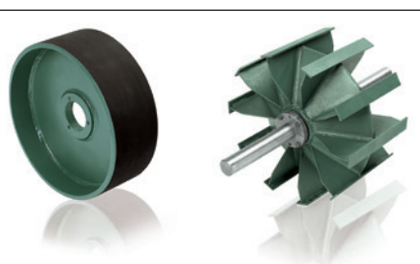
Available hub styles	HE or XT
Product features	Minimum 16 mm x 38 mm contact bars for high durability
	12 mm SBR rubber vulcanized directly onto wings available
	Meet CEMA dimensions

Spiral wing pulleys



Available hub styles	HE or XT
Product features	Minimum 6 mm x 38 mm spiral contact bars Smooth running for low impact on belt splices

Elevator pulleys



Available hub styles	HE or XT
Available lagging	Vulcanized lagging up to 25 mm thick in SBR or FOS (Fire, oil & static resistant) rubber
Product features	Single disc and double disc drum types Holz and Holz SOF style 5 lagging Exceeds CEMA application standards up to 61 kN/m (350 PIW)

Pulley assemblies

Benefits	Complete assembly of conveyor pulley, bushings, shaft, bearings and coupling
	Expert mounting and lubrication of large bore bearings
	All exposed metals covered with anti-rust protection
	Long-term storage preparation available
	Custom pallets for both flatbed and export shipments available

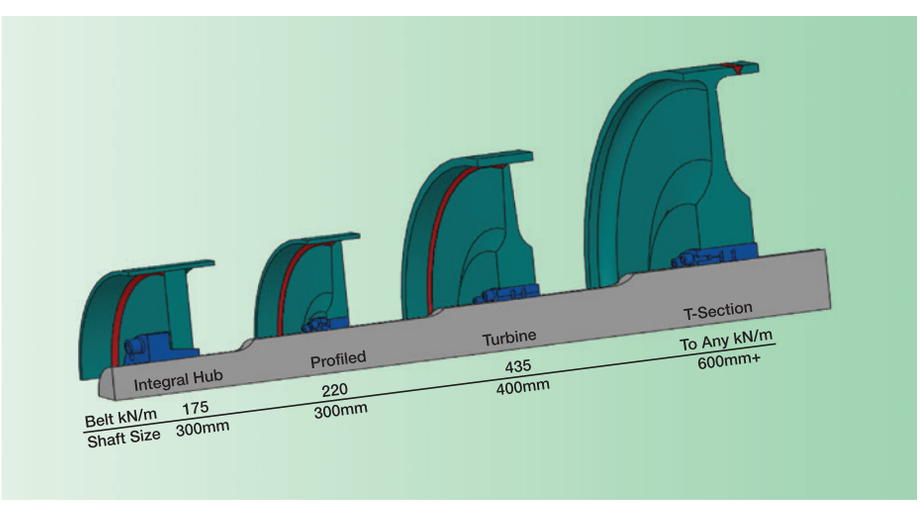
Mechanical power transmission
Product overview – Engineered class conveyor pulleys

High performance and intelligent design delivering reliability throughout the world for over 100 years.
From underground mines to high in the mountains, Dodge provides heavy duty, engineered class pulleys that deliver reliability worldwide. Dodge engineers utilize FEA models and state-of-the-art technologies to design conveyor pulley assemblies of the highest quality.

Engineered class pulleys

Shaft locking devices	HE, XT or Bikon
End disc designs	Integral hub, profiled, turbine and T-section
Available lagging	Vulcanized, Standard SBR, fire and oil resistant Neoprene, or abrasion resistant D-Lag. High-traction ceramic (available cold bonded or vulcanized)
Product features	Standard 1045 or high strength 4140 shaft material Available stainless steel construction for non-magnetic applications 2 year warranty
Manufacturing capabilities	High-strength submerged arc welds Thermal stress relieving CNC machining of shaft and pulley Static and dynamic balancing Expert assembly of pulley, shaft, bearings, coupling and backstop
Quality certifications	ISO 9001:2008 AWS and ASME certified welding procedures and welders ASNT NDE certified inspection program Material certifications on all materials

Engineered class pulley end disc designs



Mechanical power transmission
Product overview – System-1™

System-1

System-1 is an integrated single source for all your mechanical and electrical power transmission needs.

System-1 can optimize your equipment performance and reliability, assist in coordinating multi-product projects, reduce overall costs, and ultimately improve your company's profitability.

Consider how much time and money your company spends in designing, selecting, and sourcing all the power transmission components of a drive system. Rather than contacting multiple vendors, ordering mismatched components, coordinating multiple shipments, and paying multiple bills, simply contact System-1 for your next package opportunity. System-1 is the industry's proven single source provider for innovative drive system solutions.

Key industries:

- Grain
- Aggregate / Cement
- Mining / Metals
- Power Generation
- Food / Beverage / Pharmaceutical

Bulk material handling conveyors

- Unmatched quality
- Optimized product selection
- Single point of contact
- Pre-assembled package

One System – One Source – One Solution

Bulk material handling conveyors

System-1 specializes in customized bulk material handling solutions. This unique service combines design engineering skill with in-depth product knowledge, to deliver packaged solutions for projects with:

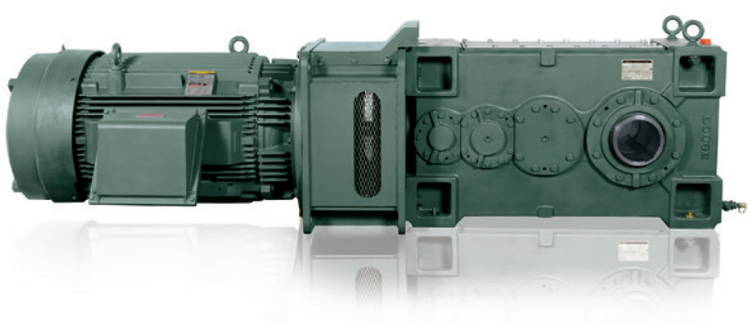
- Single drive capacity up to 1,000 kW – multiple drives up to 8,000 kW
- Common conveyor profiles up to 2 kilometers – unlimited custom designs
- Typical capacities up to 4,000 tonnes per hour

Mechanical power transmission
Product overview – System-1™

Pre-engineered Torque-Arm® II package

Shaft mount drive	4 to 75 kW (5 to 100 hp)
	25 to 100 RPM
Screw conveyor drive	0.75 to 30 kW (1 to 40 hp)
	25 to 125 RPM

Pre-engineered MagnaGear XTR package



Right angle on swingbase, base plate, or tunnel housing	37 to 300 kW (50 to 400 hp) solid and hollow output
Parallel on heavy duty base plate	37 to 450 kW (50 to 600 hp) solid output

Pre-engineered creep drive package

Single drive	55 to 132 kW (75 to 200 hp)
Dual drive	110 to 315 kW (150 to 400 hp)

Contact us

www.abb.com/mechanicalpowertransmission

9AKK106368 EN 12-2014

Power and productivity
for a better world™