

The background of the slide is a technical drawing, likely a cross-section of a mechanical assembly. It features various components, including what appears to be a bearing or roller assembly, with numerous callout numbers (13, 14, 15, 16, 17, 18, 19, 20, 21) pointing to specific parts. The drawing is rendered in a light gray line-art style. A large orange rectangle is positioned on the left side of the slide, partially overlapping the technical drawing. The text 'TIMKEN' is written in white, bold, sans-serif capital letters within this orange rectangle. To the right of the orange rectangle, the text 'Food & Beverage' is written in white, bold, sans-serif capital letters on a dark gray background. At the bottom of the slide, there is a white bar containing the text 'Stronger. By Design.' in a black, sans-serif font. The word 'By' is highlighted in orange.

TIMKEN

Food & Beverage

Stronger. **By Design.**

How to use this presentation

This comprehensive Food and Beverage Customer presentation has been developed to share key information with your customers about the food and beverage market. It details the full range of Timken solutions. It is not intended to be delivered in its entirety.

The goal:

Position Timken as the leading solutions provider in the Food and Beverage industry. By highlighting the food safety requirements Timken meets, as well as the increased uptime, productivity and quality it provides and focused on industry excellence.

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- **Timken at-a-glance**
- **Industry challenges in F&B processing**
- **Timken in the F&B market**
 - Market positioning
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 - Served market segments & applications
- **Bearings & MPT solutions**
 - Products for corrosive environments
 - Products for general food processing applications
 - MPT solutions
 - Subset system solutions
- **Customer success story / case studies**

Industry challenges in F&B processing

Trends Driving Change in Food & Beverage

- **Favorable demographics and positive macro indicators drive long term growth in food production**
- **Consumers are demanding safer, more hygienic and healthier food**
 - Governments implement consistent upgrades to food safety legislation
 - Good safety requirements drive increasing levels of automation
- **Food processors start to address consumer's request for sustainability of food production**
 - Increasing investments in technology to reduce carbon food print, water consumption and waste
- **Reduce maintenance cost and improve machinery uptime**

Food & Beverage Industry Challenges

Improve Food Safety
USDA-accepted housing

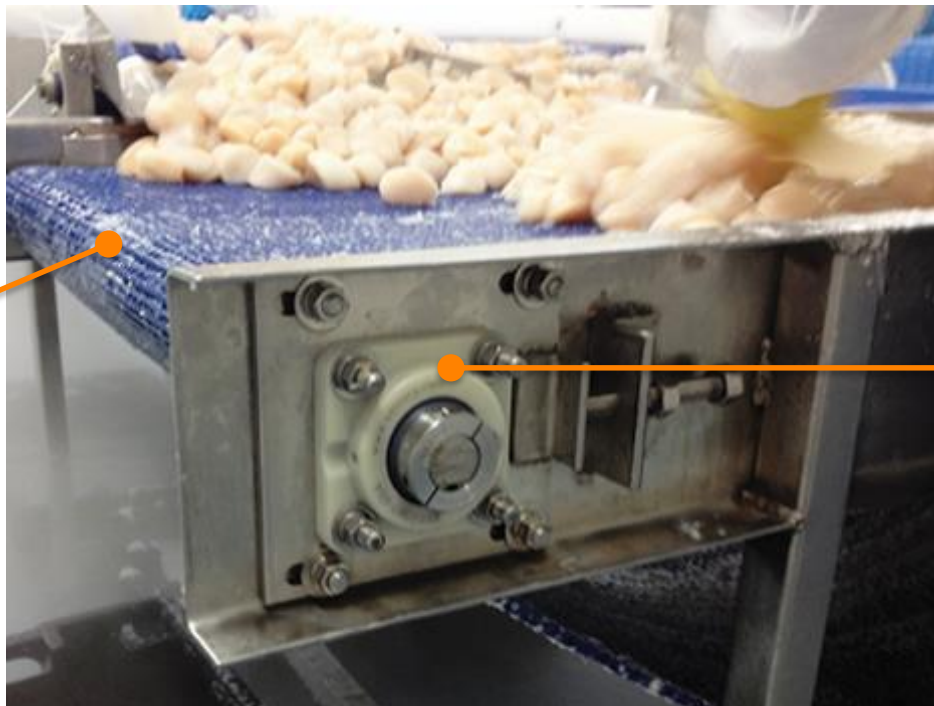
Maximize Up-Time
Increased Bearing life

Reduce Maintenance Cost
Reduce or eliminate re-greasing

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Food Contact Surfaces



FOOD CONTACT SURFACE
Compliant materials
required

NON-FOOD CONTACT
SURFACE
splash zone – product
is scraped

Timken in the F&B market

Market Positioning

- The United States has the strictest food safety legislation in place worldwide. With its headquarters in the U.S., Timken offers products that meet and exceed the tightest regulations.
- Timken competes in the premium product performance market space. Our F&B offering provides you with products that range from “performance” to “best-in-class” to provide you with the machinery uptime and food safety that you and your customers expect.
- With a broad range of bearings, housed units, mechanical power transmission products and lubrication solutions, Timken is ultimately positioned as a full-range supplier to the F&B industry.



Value Proposition

- We offer products and solutions that:



- **Each product line is part of a wide variety of F&B specific bearing and PT products that allows customers to reduce their supply chain complexity**
- **Customers benefit from Timken's application knowledge and access to our industry-leading technical support**
- **Timken's global operations and logistics assure accessibility to products and support worldwide**

Timken Savings for Food and Beverage

Timken saves customers money by:

- Improving safety
- Reducing maintenance
- Decreasing unplanned downtime
- Increasing overall productivity

Customer testimonials:



Equipment	Product	Benefit	Annual Savings
Soup processing line	Poly-Round®	Reduced maintenance, eliminating lubricator position	\$50,000
Meat slicer	Solid Lube Radial	Reduced maintenance, no lubrication needed	\$18,000
Almond processing - Modular belt	Poly Round	Longer life, no lubrication needed, reduced maintenance	\$165,500
Fruit sizing/sorting machine	Silvershield chain	Corrosion resistant, longer life, reduced maintenance	\$25,000
Beverage cooling line	Poly-Round®	Decreased unplanned downtime, reduced maintenance	\$320,000
Snack food processing	ER ball housed unit	Improved safety, decreased unplanned downtime	\$120,000
Breeder application	QuiKlean® solution	Improving safety, decreased unplanned downtime	\$20,000

Improving Food Safety



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Avoid food contamination

Contamination can affect:

- Public health
- Product quality (taste aspect)
- Brand reputation
- Financials

Hazard	Examples	Mitigation
Chemical	Lubricant leakage	Food-grade lubricants Grease-less bearings
	Corrosion	Corrosion and wash-down resistant materials
	Substances migrating from polymers	Food-contact materials
Physical	Foreign particles (loose or broken parts)	Metal detectability Optical detectability
Micro-biological	Bacteria developing in dead spaces	Smooth surfaces Rounded corners Draining No dead space

Maximizing Up-time



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Reduce processing equipment down-time

Down-time can affect:

- Plant output
- Loss of livestock or perishable products
- Financials

Cause	Examples	Solutions
Cleaning	Wash-down	Hygienic Design
Preventive Maintenance	Re-lubrication	Lube-for-life
Curative Maintenance	Failure	Robust components
Quality	Food contamination	Hygienic Design

Reducing Costs



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Cost-effective components can generate higher operating costs

Check TCO (Total Cost of Ownership) instead of price

Operating Costs	Examples	Solutions
Cleaning	Wash-down: labor, chemicals, heat	Lubed-for-life, Hygienic Design
Preventive Maintenance	Re-lubrication: labor, material	Lubed-for-life
Curative Maintenance	Down-time, repair time, spare parts	Robust components
Quality	Scrap, product recall	Hygienic Design

Regulations and Certifications

Regulation Body	Scope	Regulation	Certification
FDA	Food-grade Lubricants	FDA 21.CFR 178.3570 Lubricants with Incidental Food Contact	NSF H1 Registered Lubricant Lubricants with Incidental Food Contact, formerly USDA H1
FDA	Food Contact Materials (US/global)	<ul style="list-style-type: none"> • FDA 21.CFR 177.2600 Rubber Articles Intended for Repeated Use • FDA 21.CFR 175.300 Indirect Food Additives 	
EU, EC	Food Contact Materials (Europe)	<ul style="list-style-type: none"> • EC 1935/2004 (general requirements) • EU 10/2011 (polymers) 	
USDA	Hygienic Design	NSF/ANSI/3-A SSI-14159-1-2014 Hygiene Requirements for the Design of Meat and Poultry Processing Equipment	USDA Equipment Acceptance

Hygienic Design

Practice to design machines that enable a safe food production

- Reduce chemical, physical and microbiological hazards
- Features include corrosion-resistant materials, food-grade lubricants, cleanable geometry, etc.

Also improves up-time and reduce TCO

- Reduce wash-down down-time and expenses
- Avoid product quality issues

Timken member of EHEDG

European Hygienic Engineering and Design Group



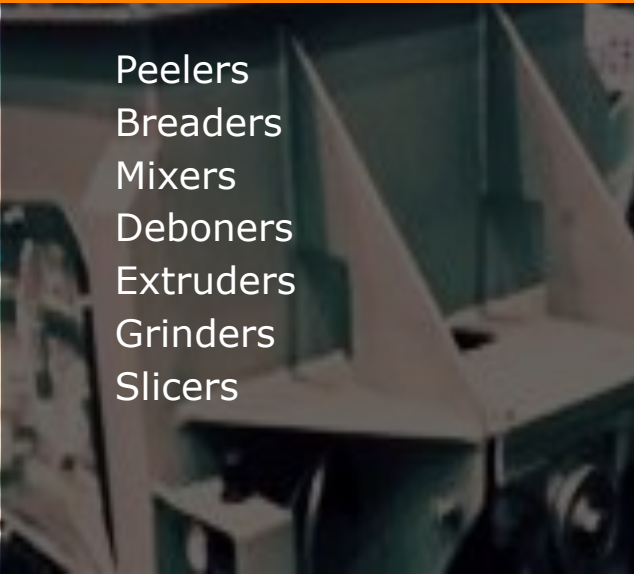
Market Segments Served By Timken

- Protein processing
- Fruit & vegetable processing
- Beverage production
- Dairy production
- Baked goods
- Snack foods and candy production
- Chocolate and confectionary production
- Case-ready meals
- Packaging machinery



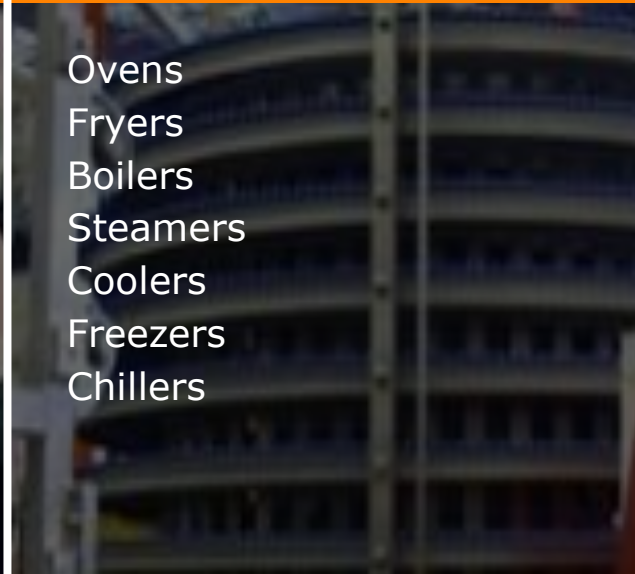
Applications

Mechanical Processing




Peelers
Breaders
Mixers
Deboners
Extruders
Grinders
Slicers

Thermal Processing



Ovens
Fryers
Boilers
Steamers
Coolers
Freezers
Chillers

Handling and Packing



Modular Belt Conveyors
Wire Belt Conveyors
Sanitary Wash Tanks
Single Pivot Dumpers
Fabrication
Sizing and Sorting
Packing Machines

Food and Beverage Process Overview

Mechanical Processing



Ball and Roller
Housed Units



Spherical Roller
Bearings



Cylindrical Roller
Bearings



Tapered Roller
Bearings



Thrust Bearings

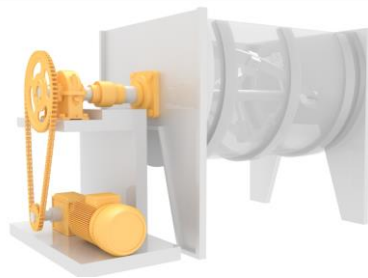


Ball Bearings

Thermal Processing

Handling and Packaging

Extruder



Mixers



Peelers

Food and Beverage Process Overview

Mechanical Processing



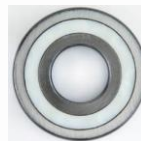
Ball and Roller
Housed Units



Ball Housed Unit



Stainless Steel
Chain



Stainless Deep Groove
Ball Bearings



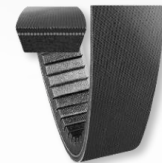
Stainless Steel
Housed Units



Poly-Round
Plain Bearings



Couplings

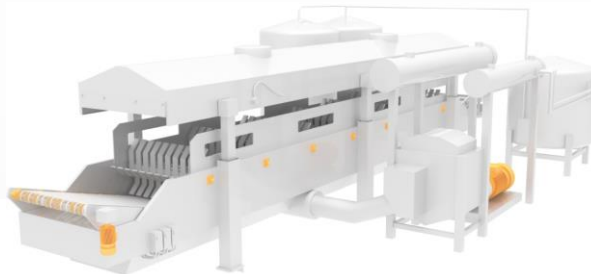


Belts

Thermal Processing

Handling and Packaging

Ovens



Fryers

Chillers



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Food and Beverage Process Overview

Mechanical Processing

Thermal Processing

Handling and Packaging



Roller
Housed Units



Ball Bearing
Housed Unit



Poly-Round
Plain Bearings



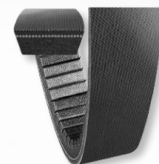
Attachment
Chain



Deep Groove
Ball Bearings

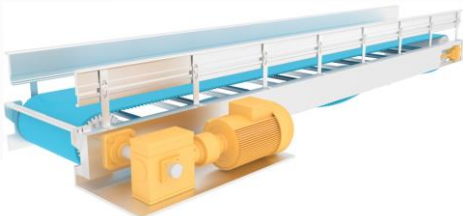


Couplings



Belts

Food Conveyors

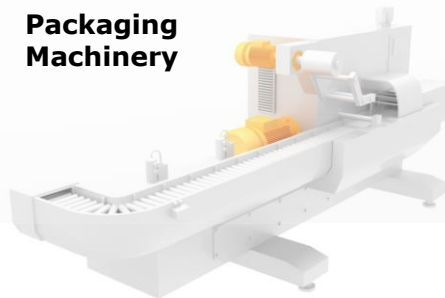


TIMKEN

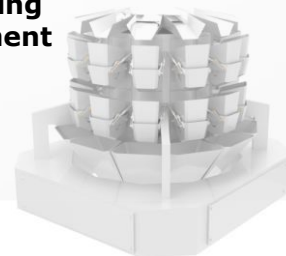


Modular
Belt
Conveyors

Packaging Machinery



Weighing Equipment



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Product Range for Food & Beverage

Timken Engineered Bearings

Housed Units



Ball Bearings



Tapered



Cylindrical



Spherical



Belts



Chain & Augers

Couplings &
Universal JointsGears &
Gear DrivesStainless
GearboxesLubrication
Systems

Mechanical Power Transmission Products

Timken Coatings

Extend Product Life. Reduce Downtime.

From corrosion resistance to wear protection, surface treatment helps limit bearing and component damage

PVD Coatings

- ES200
- ES300
- ES302

Electrodeposited Coatings

- Aquaspexx®
- Thin Dense Chrome (TDC)

Surface Conversions

- Black Oxide
- Zinc Phosphate

Spray Coatings

- E-Coat
- Powder Coat
- Dielectric Coat



Products for corrosive environments

Timken Corrosion-Resistant Ball Bearing Housed Units

Stainless Steel

Stainless steel solid body housing
Smooth surface
Laser marking
Lubrication hole plugged for Solid Lube insert



Hygienic Stainless Steel

Hygienic machined stainless steel housing
Ultra smooth surface housed unit
USDA acceptance for housings
Laser marking
No lubrication hole for Solid Lube insert



White Polymer (thermoplastic)

White polymer (thermoplastic) solid body housing
Smooth surface
Laser marking
Lubrication hole plugged for Solid Lube insert

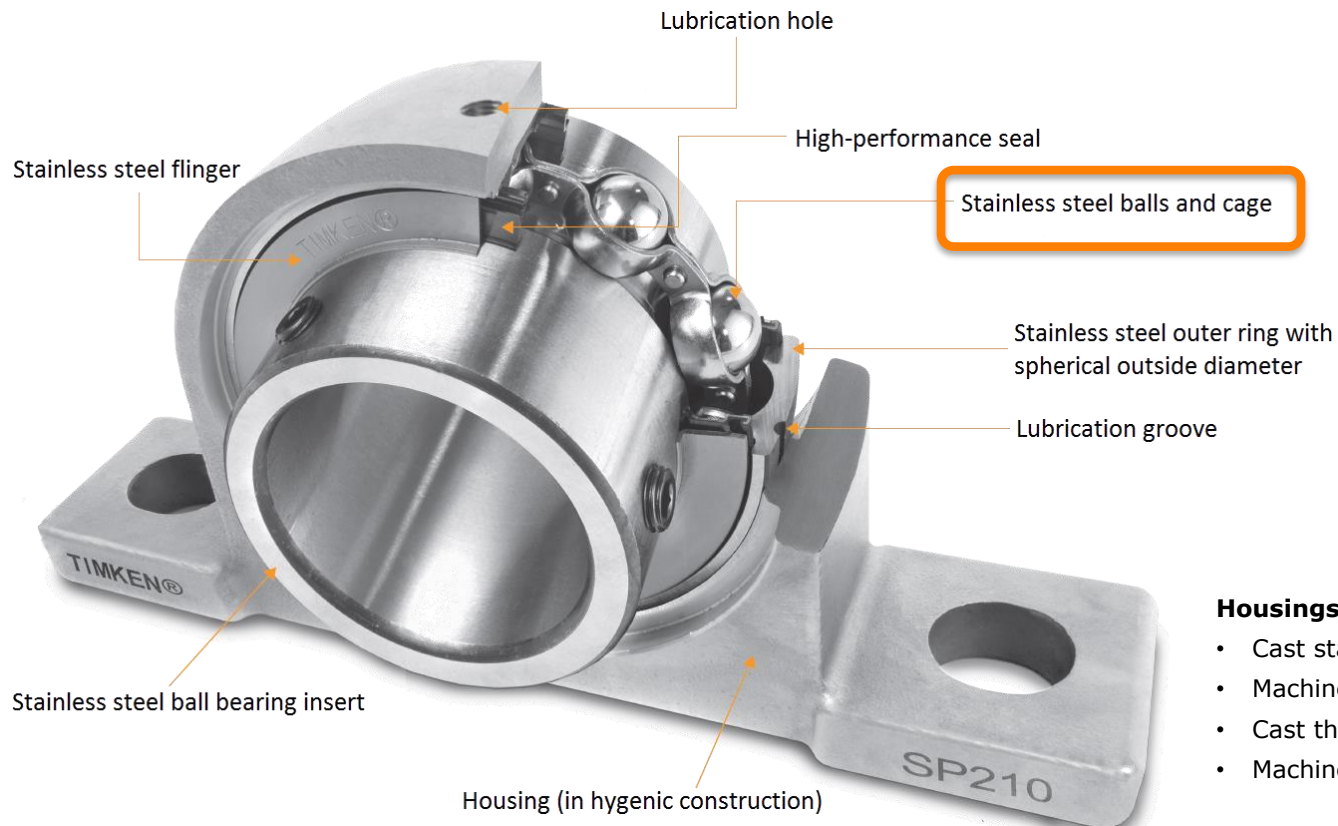


Hygienic blue (thermoset)

Hygienic blue polymer solid body housing
Ultra smooth surface
USDA acceptance for housings
Laser marking
No lubrication hole for Solid Lube insert



Corrosion-Resistant Housed Units



Housings:

- Cast stainless
- Machined stainless
- Cast thermoplastic (White)
- Machined thermoset (Blue)

Timken Corrosion-Resistant Poly-Round® Plain Bearing Housing Units

Stainless Steel

Stainless steel solid body housing
Smooth surface
Laser marking
Lubrication hole plugged for Poly-Round



Hygienic Stainless Steel

Hygienic machined stainless steel housed unit
Ultra smooth surface
USDA acceptance housed unit
Laser marking
No lubrication hole for Poly-Round insert

White Polymer (thermoplastic)

White polymer (thermoplastic) solid body housing
Smooth surface
Laser marking
Lubrication hole plugged for Poly-Round



Hygienic blue (thermoset)

Hygienic blue polymer (thermoset) solid body housing
Ultra smooth surface
USDA acceptance housed unit
Laser marking
No lubrication hole for Poly-Round insert

Corrosion-resistant U-series Housings

Hygienic

Stainless Steel (A)



Blue Polymer (B)



Stainless Steel (S)



White Polymer (PL)



Standard

Polymer vs. SS Housing

Polymer



- Cost-effective
- Suitable for most applications, including wash-down

Stainless Steel



For applications with:

- Higher loads / shock loads
- High ($>72^{\circ}\text{C}$) or low ($<-40^{\circ}\text{C}$) temperatures
- Critical foreign particle hazard
- Harsh chemicals and/or direct food contact (with appropriate bearing)

Polymer Housings

Standard



- Solid base
- Thermoplastic material
- Smooth surface
- Co-molded hole inserts
- Laser marking

Hygienic



- Solid base
- Thermoset material
- Ultra-smooth surface
- No bolt hole insert
- Laser marking
- Blue Color for optical detectability
- No grease nipple hole (grease-less bearings)
- USDA Equipment Acceptance



Stainless Steel Housings

Standard



- Solid base
- Smooth surface
- Laser marking

Hygienic

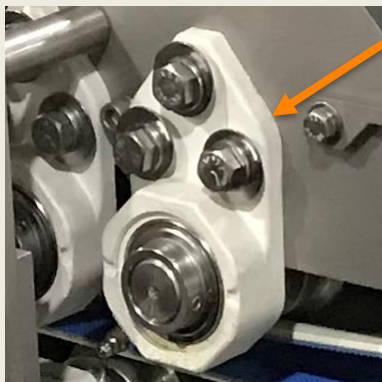


- Solid base
- Ultra-smooth surface
- Laser markings
- No grease nipple hole (grease-less bearings)
- USDA Equipment Acceptance



Quiklean® Option

Standard Practice

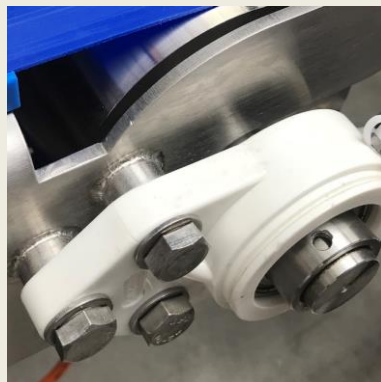


Dead
Space

Possible sealing

- Sealant: high labor, less flexibility
- Elastomer seal: questionable effectiveness and durability

Industry Best Practice



- Avoid dead space
- Improve cleanability

Timken Quiklean®



Quiklean integral stand-off

- Lower cost (labor)
- Lower safety hazard (no welding, 1 less interface)

Available for Blue Polymer (B)
Standard Stainless Steel (S)
Hygienic Stainless Steel (A) upon request

Stronger. By Design.

Housing Availability Matrix

Inserts available for the below housing combinations:

Stainless steel setscrew inserts available in 204-210 sizes. Poly-Round® inserts available in 203-216 sizes.



Type	Housing Type	Stainless Housing														Polymer Housing													
		Insert Series														Insert Series													
		203	204	205	206	207	208	209	210	211	212	214	215	216	203	204	205	206	207	208	209	210	211	212	214	215	216		
Standard Housings	Pillow block (P)		●	●	●	●	●	●	●								●	●	●	●	●	●	●						
	Two-bolt flange (FL)		●	●	●	●	●	●	●								●	●	●	●	●	●							
	Three-bolt flange (FB)		●	●	●	●	●										●	●	●	●									
	Four-bolt flange (F)		●	●	●	●	●	●	●	●							●	●	●	●	●	●	●						
	Take-up, wide slot (T)		●	●	●	●	●	●	●	●																			
	Tapped base (TB)		●	●	●	●	●	●	●	●																			
	Tapped base, Y Series design with imperial thread (TBY)		●	●	●	●	●																						
Premium Hygienic Housings (A-B-G)	Pillow block (P) ⁽¹⁾	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
	Pillow block, low-base (PL)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
	Two-bolt flange (FL) ⁽¹⁾	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
	Two-bolt flange, small bolt pattern (FLS)	●	●	●	●	●											●	●	●	●	●								
	Three-bolt flange (FB) ⁽¹⁾	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
	Three-bolt flange, round (RFB)	●	●	●	●	●	●	●	●								●	●	●	●	●								
	Four-bolt flange (F) ⁽¹⁾	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
	Piloted flange, four-bolt (FC)			●	●	●	●	●	●	●	●	●	●	●	●	●			●	●	●	●	●	●	●	●	●		
	Take-up, wide slot (T)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
	Take-up, narrow slot (TN)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
	Tapped base, Y series design with imperial thread (TBY) ⁽¹⁾	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●						
	Tapped base, Y series design with metric thread (TBYM) ⁽¹⁾	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●						
	Hanger bearing (H)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●													

⁽¹⁾QuiKlean® available in pillow block, tapped base, 2-bolt, 3-bolt extension and 4-bolt flanges as standard (204-210 insert series).

*Additional insert series and housing types available in future launch phases

● Available

Housing End Covers Compatibility Matrix

Model		Sizes	Standard Polymer (PL)	Standard Stainless Steel (S)	Hygienic Polymer (B)	Hygienic Stainless Steel (A)
Polymer*		204-210 Open: Metric shafts	●	●		
Stainless Steel		204-210 Open: Metric shafts		●		

* Timken polymer end covers have drain holes that allow entering water to drain out.

Corrosion-resistant U Series Bearings

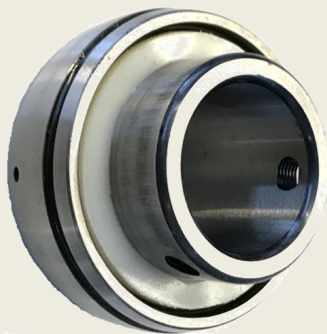
Food-grade Grease (standard)

Stainless steel ball bearing
with NSF H1 (FDA) grease



Food-grade Solid Lube LUBED-FOR-LIFE

Same + NSF H1 (FDA)
Solid Lube

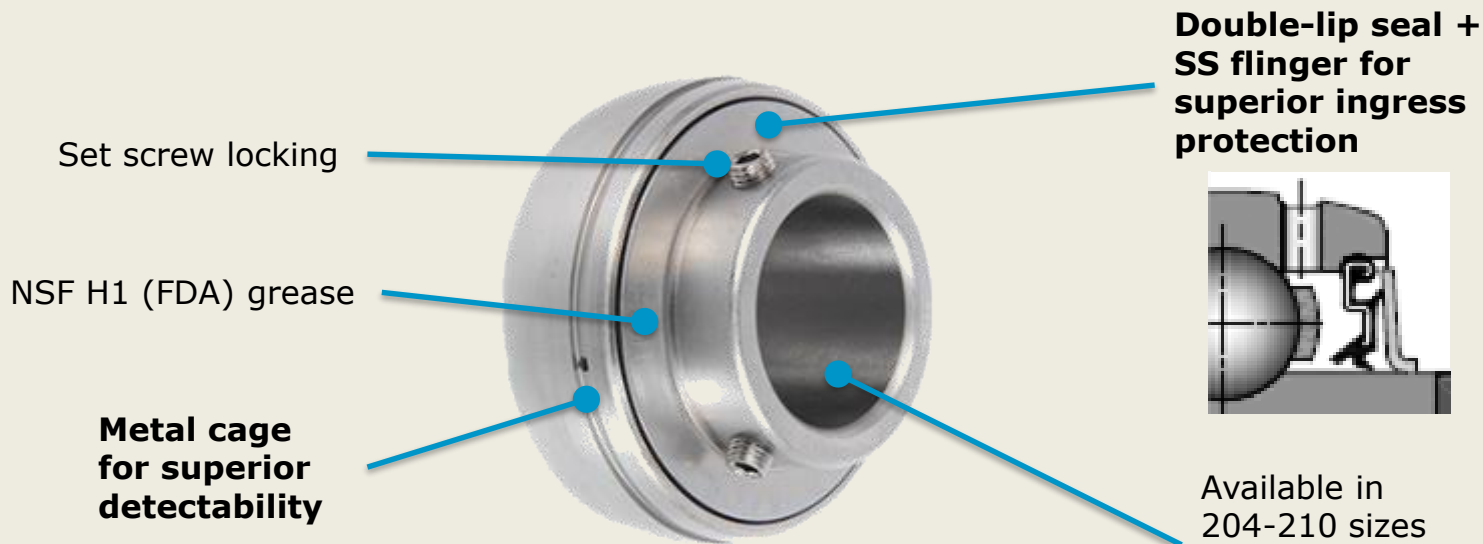


Poly-Round® Plain Bearing LUBE-LESS

Polymer bearing ring
and locking sleeve

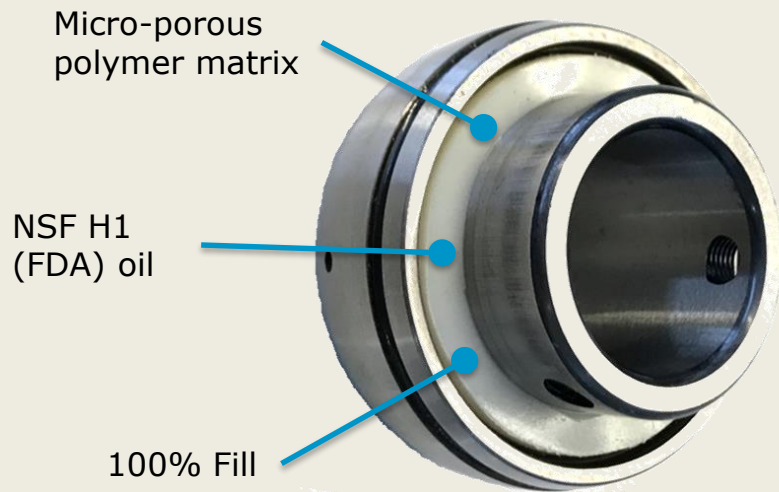


Stainless Steel Ball Bearings



Operating temperature range: -20/100°C

Solid Lube Ball Bearings



N.B.: seal removed for clarity

FOOD-SAFE

- Reduces risk of food contamination

RELIABLE

- Longer bearing life (compared to sealed for life bearing or in presence of solid contamination)
- Enhances ingress protection

COST-EFFECTIVE

- Maintenance-free (lubed-for-life)

Solid Lube Options

Timken Code	Type	Temperature Range*	NSF H1 (FDA)	Applications
/FVSL613	Standard	-45/93°C	YES	General purpose, including standard wash-down
<p>Other Solid Lubes are available to handle more specific application conditions, like:</p> <ul style="list-style-type: none"> • higher temperatures (up to 176°C – with appropriate closure) • harsher than usual wash-down <p><i>For further information please contact your Timken representative.</i></p>				

* For bearings with Solid Lube, the speed is limited by the maximum operating temperature of the Solid Lube. Consult Timken Corrosion-resistant Ball Bearing Housed Unit catalog for actual limiting speed.

Poly-Round Material Options

NA



- Suitable for moderate to medium load applications*
- Excellent wash-down and shock resistance
- Moderate chemical resistance and dimensional stability in submerged condition
- Operating temperature ranges from -40° C (-40° F) to 93° C (200° F)

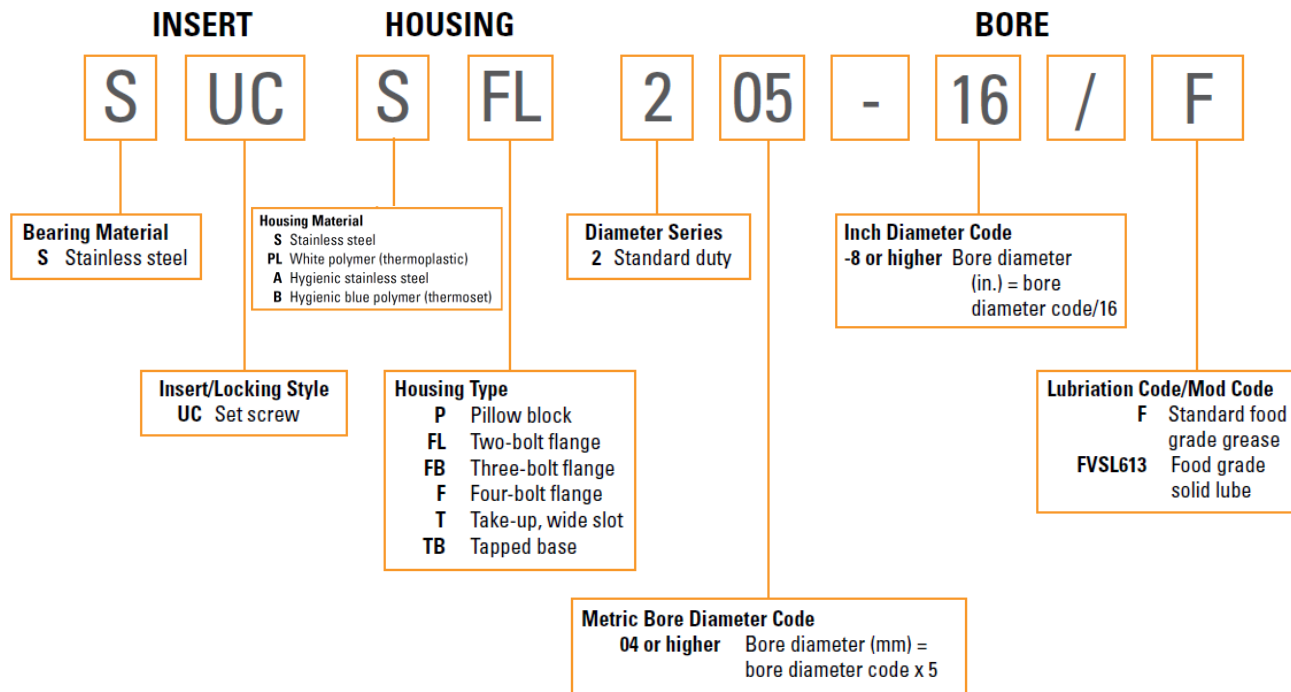
Other materials are available for more specific application conditions, like:

- *higher loads*
- *higher speeds*
- *higher or lower temperatures*
- *submersion*
- *food contact (FDA, EC 1935/2004 and EU 10/2011)*
- *optical and metal detectability*

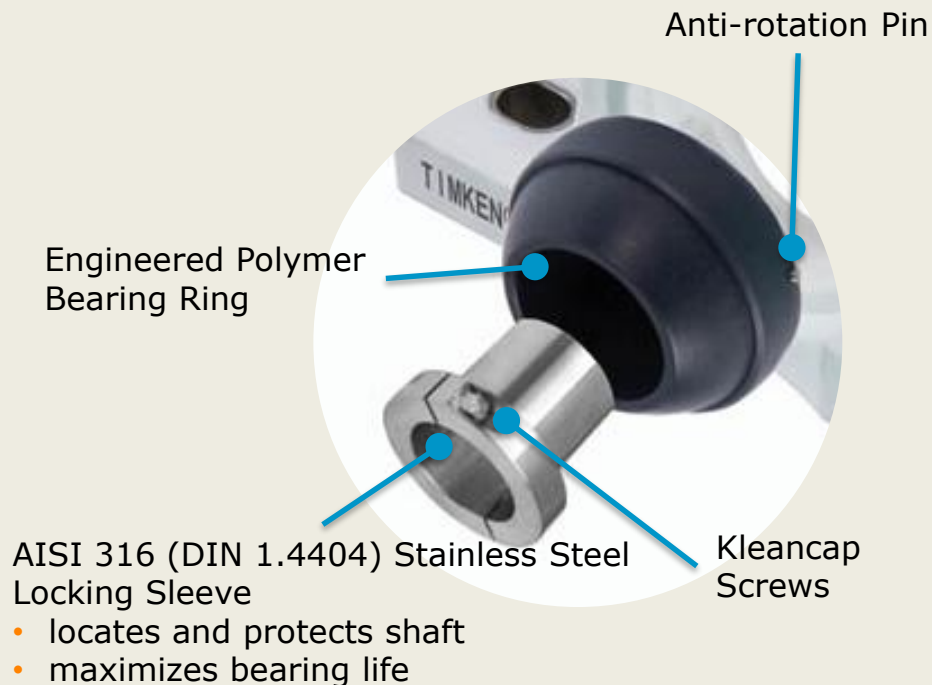
For further information please contact your Timken representative

* Consult Timken Corrosion-resistant Poly-Round Housed Unit catalog for load and speed ratings

Ball Bearings Housed Units Nomenclature



Poly-Round® Plain Bearings



FOOD-SAFE

- Reduces risk of food contamination (grease-less, resistant design)
- USDA Equipment Acceptance

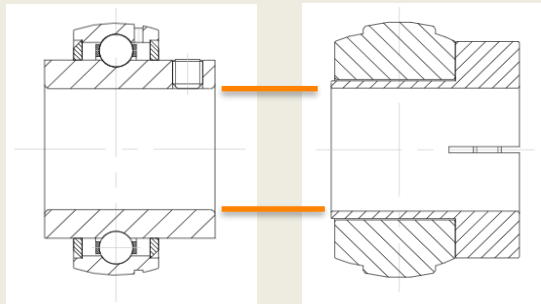
RELIABLE

- Longer bearing life in wash-down environments
- Predictable wear, no catastrophic failure

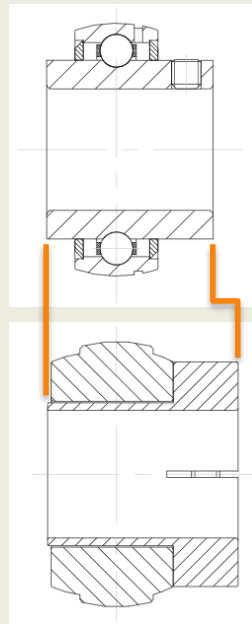
COST-EFFECTIVE

- Maintenance-free (grease-less)

Poly-Round® Dimensional Interchangeability



- Locking Sleeve Bore has shaft Size
- Use with no sleeve not recommended – consult engineering



Larger width
– generally not an issue

Poly-Round® Application NO-GO's

IN GENERAL

- Tension (belt drive) and overhung (trunions)
- High Speed (fans, pumps)
- Precise Centerline (slicers)
- Abrasive



**Friction-driven
Conveyors**



**Curved Table-Top
Chains – Drive Shaft**



**Unsupported
Geared Motor**



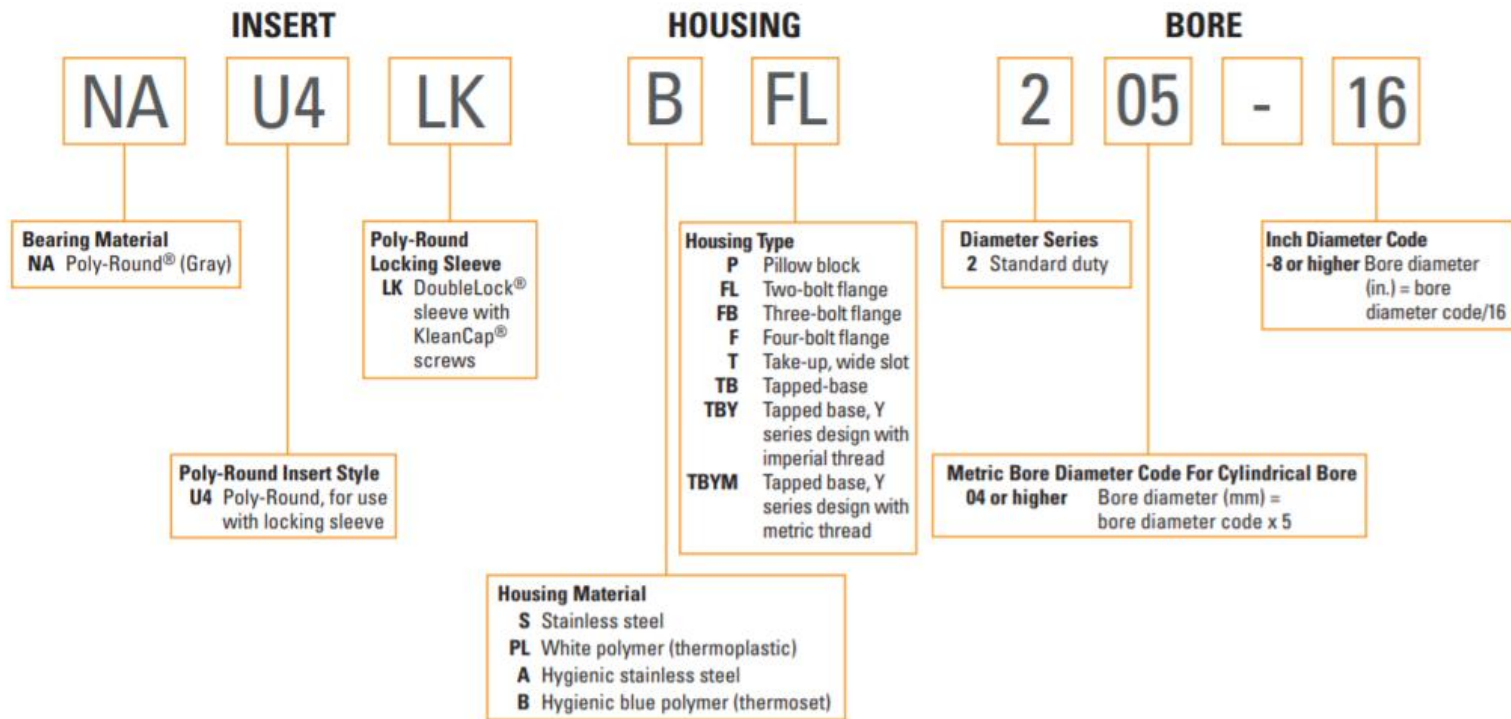
Trunions



**Oven Belt Head
and Tail Shafts**

In those applications a **solid-lubed ball bearing** is recommended

Poly-Round® Plain Bearing Housed Units Nomenclature



Summary

Standard Performance

Corrosion-resistant materials and food-grade grease



Premium Performance

Grease-less bearings in Hygienic Design housings



- Higher food-safety
- Higher up-time
- Lower TCO

Corrosion-resistant 6000 series BB

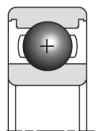
Product Portfolio

Fully stainless steel rings, balls and cage

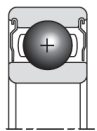
Lubrication:

- Food grade grease is standard
- Food grade solid lube & industrial grease available

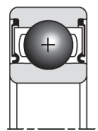
Open, sealed and shielded configurations



Open



Double shields
ZZ



Double contact seals
2RS

Available series:

- 6000 series: 10-50mm bore
- 6200 series: 10-50mm bore
- 6300 series: 10-35mm bore
- Miniature 600 and thin-section 61000
SERIES: 6-20mm bore
- R4-R12 Imperial part numbers



Lubrication Options

Code	/F	/FVSL613	(blank)
Lubricant Type	Food Grade Grease	Food Grade Solid Lube	Standard Industrial Grease
Target Market	Food & Bev	Food & Bev	Food & Bev and General Industrial
FDA-compliant* (21.CFR 178.3570)	YES	YES	NO
NSF H1-registered (formerly USDA H1)	YES	YES	NO
Kosher & Halal	YES	NO	NO
Closure	2RS, ZZ	2RS, open	2RS
Rust Preventative**	NO	NO	YES (open)

* Lubricant with Incidental Food Contact

** It is recommended to wash off rust preservative before use in food and beverage applications

Application Challenges

Primarily high hygiene environments

Wash-down

Solid Lube for superior resistance

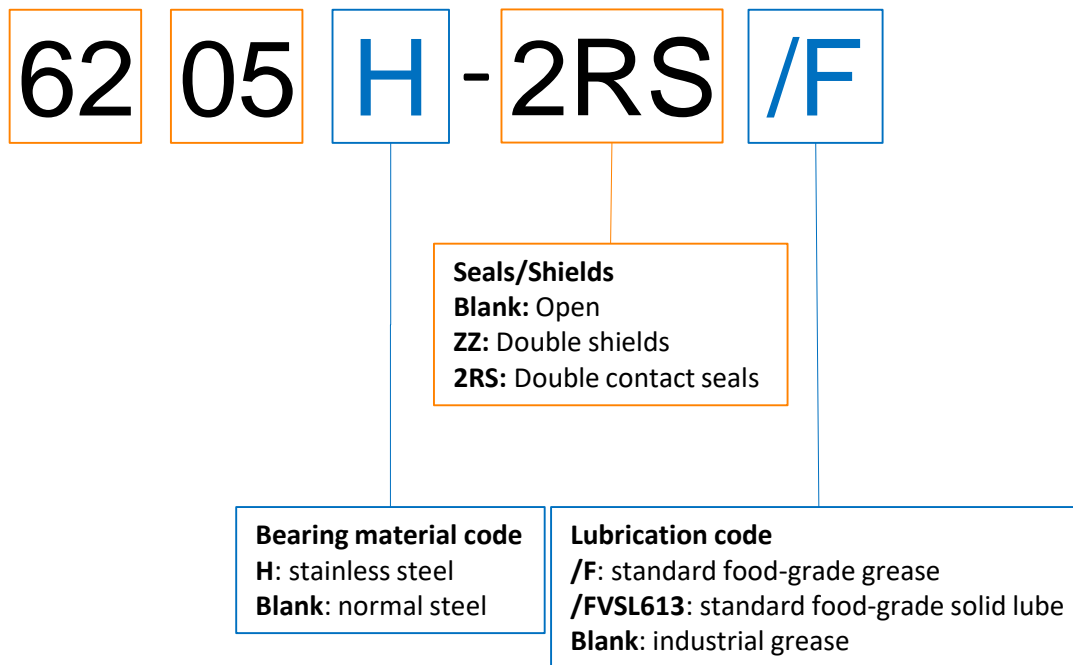
Food-safety Hazards

- Metal cage for superior detectability
- NSF H1 (FDA) lubricant options (grease or Solid Lube)
- Solid Lube

Demand for food-grade lube may vary by customer and position in the application



Nomenclature



Timken Solid Lube – Ball Bearings



Solid Lube options are available relating to:

- All bearing products*
- High temperature applications
- Harsh chemical washdown
- High speed applications
- Grease leak/contamination
- Timken Ball inserts available open, sealed, and sealed with flinger
- Timken DGBB and ACBB available open and sealed

VSL613 Food Solid Lube option: NSF H1 registered synthetic oil

- Complies with FDA guidelines for lubricants with incidental food contact
- Maintains proper lubrication for a wide range of operating temperatures from -49° F to 199° F (-45° C to 93° C)
- Provides protection against corrosion



Solid Lube Options

- Wide selection of solid lube bearings available from stock
- Broad selection of lubricant options for various applications
- 'VSL613' lube is an excellent choice for general food applications when moisture is an issue.
- 440C Stainless Set Screw Locking
- NSF H1 (FDA) Solid Lube



Bearing Material	Color	Temperature Range
NSF H1 food grade grease	White	32° to 280°F / 0° to 140°C
NSF H1 food grade polymer (EPL)	White	-55° to 200°F / -48°C to 93°C
NSF H1 food grade polymer (EPL)	White	-65° to 275°F / -54° to 135°C
NSF H1 food grade polymer (EPL)	White	-25° to 350°F / -32° to 176°C
NSF H1 food grade polymer (EPL)	White	-40° to 500°F / -40° to 260°C
Industrial grade polymer (EPL)	Gray	-55° to 215°F / -48°C to 102°C
NSF H1 food grade graphite (EGL)	Black	-150° to 250°F / -101° to 121°C
NSF H1 food grade graphite (EGL)	Black	32° to 450°F / 0° to 232°C
NSF H1 food grade graphite (EGL)	Black	40° to 650°F / 5° to 343°C

Ball Bearing Housed Unit Applications

POLY-ROUND

SOLID LUBE

Conveyors

SOLID LUBE

POLY-ROUND

Mixer

POLY-ROUND

Dumper

POLY-ROUND

SOLID LUBE

Screw Elevator

SOLID LUBE

Tumbler

SOLID LUBE

Breeder

POLY-ROUND

SOLID LUBE

Fryer / Oven

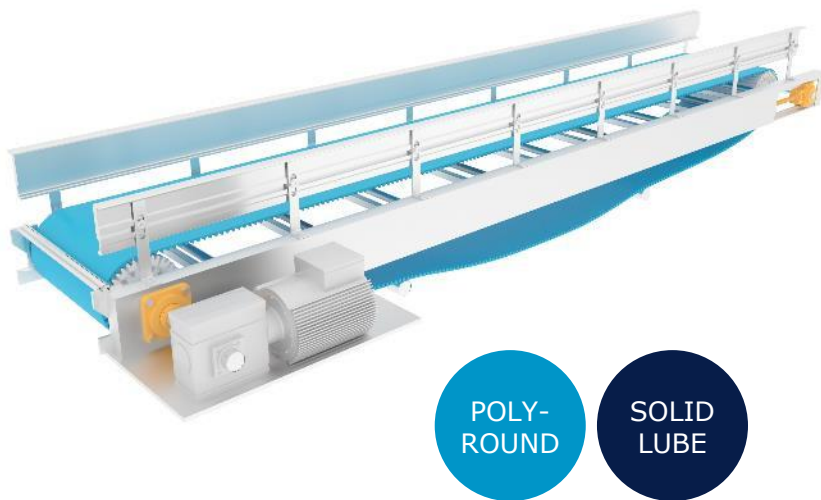


POLY-ROUND



Tunnel Freezer / IQF

Conveyors



Function

- Material Handling
- Processing: injector, metal-detector, X-ray detector, coater, slicer, checkweigher, thermo-former, pasteurizer/chiller

Belt Types

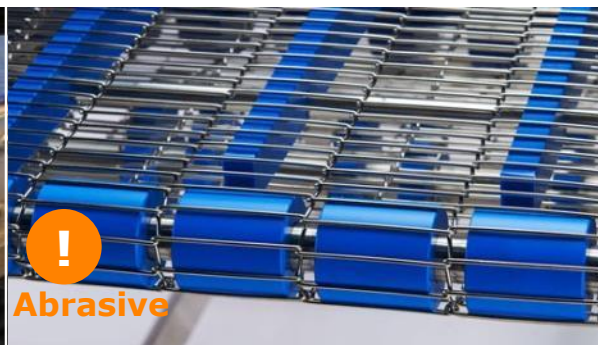
- Positive Drive -Modular Belts
- Friction-drive -Flat-, Round- and V-Belt

Check geared motor support

Conveyor Types



Modular Conveyor Belt



Wire Mesh Belt



Round Belt



Friction-driven Flat Belt



Sprocket-driven Flat Belt

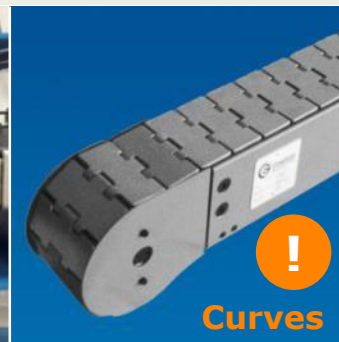


Table-top Chain



Oven Chain

Meat Processing Line

Bearing over
Product



Grease-less
100% metal-detectable
superior cleanability

Bearing over
Product



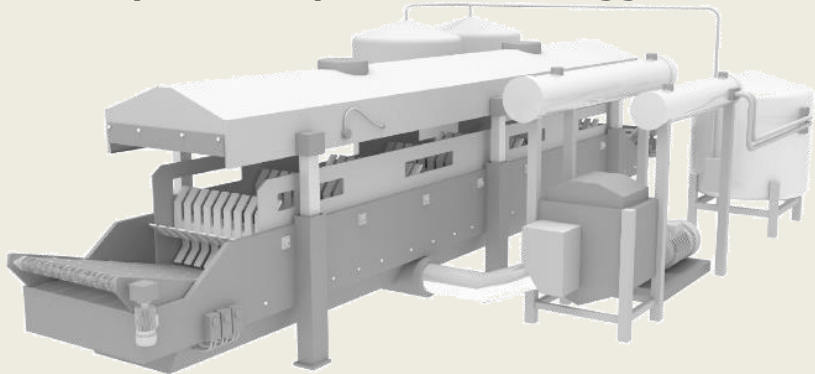
Grease-less
100% detectable
superior cleanability



Fryers

Coming
Q2/2020

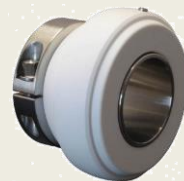
**Tunnel fryers, paddle fryers
for potato chips, crackers, nuggets**



Application challenges:

- High temperature
- Submerged in oil
- Direct food contact
- Wash-down

Solutions



FA Poly-Round (FDA)



SS Ball Bearing with
Graphite Solid Lube
(NSF H1)

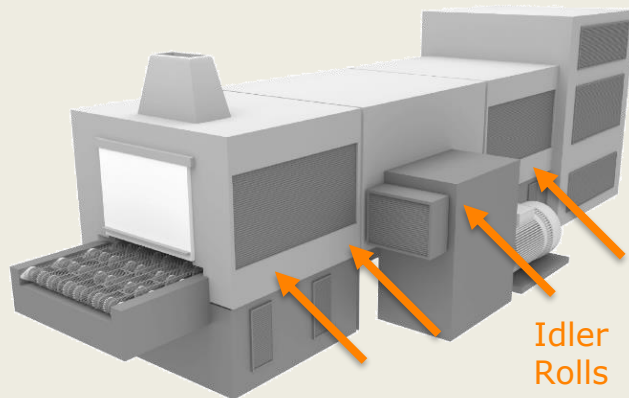
Benefits:

- Food-safe
- Maintenance-free
- Reliable

Ovens

Coming
Q2/2020

**Oven, dryers, roasters for crackers, biscuits,
breakfast cereals, pet food**



Application challenges:

- High temperature
- Contamination hazard
- Difficult relubrication

Solution



High-temperature Poly-Round
(fix/floating arrangement)

Benefits:

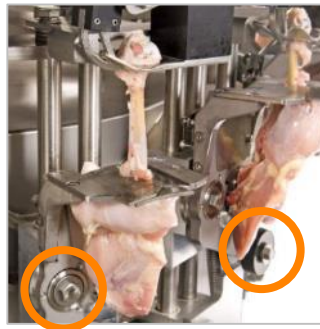
- Food-safe
- Maintenance-free
- Reliable

Ball Bearing Applications

**Flat Belt
Conveyors
(rolls)**



**Poultry
Processing –
Automated
Eviscerating and
Deboning
Machines
(cam rolls, pivots)**



**Packaging –
Combination
Weighers
(bucket and
linkage pivots)**



**Packaging –
Thermoformer /
HFFS (coil shafts)**



**Packaging – VFFS
(coil shafts)**



**Beverage –
Filling / Seaming
Machines
(cam rolls)**



Chain

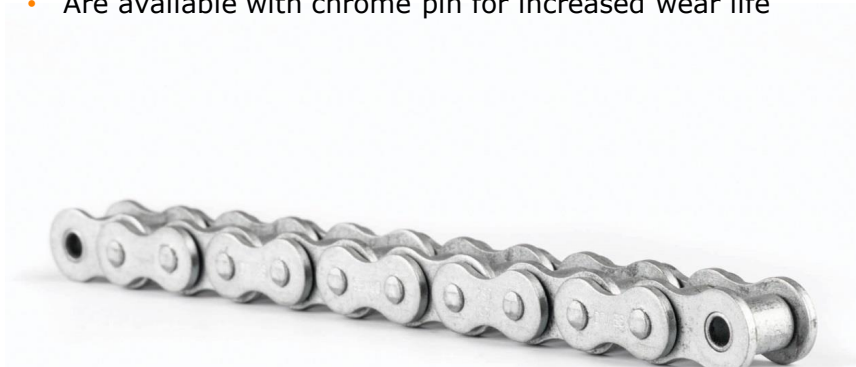
Stainless Steel Chains

- 3 Types of Stainless chain
 - AS series 600SS round parts with 300SS link plates
 - PS – All 304SS
 - NS – All 316 SS
- Complete product offering to address any type of application
 - Corrosion resistant
 - Extreme temperatures
- Wide range of sizes, configurations
- Available with attachments



Silver Shield CR® Chain

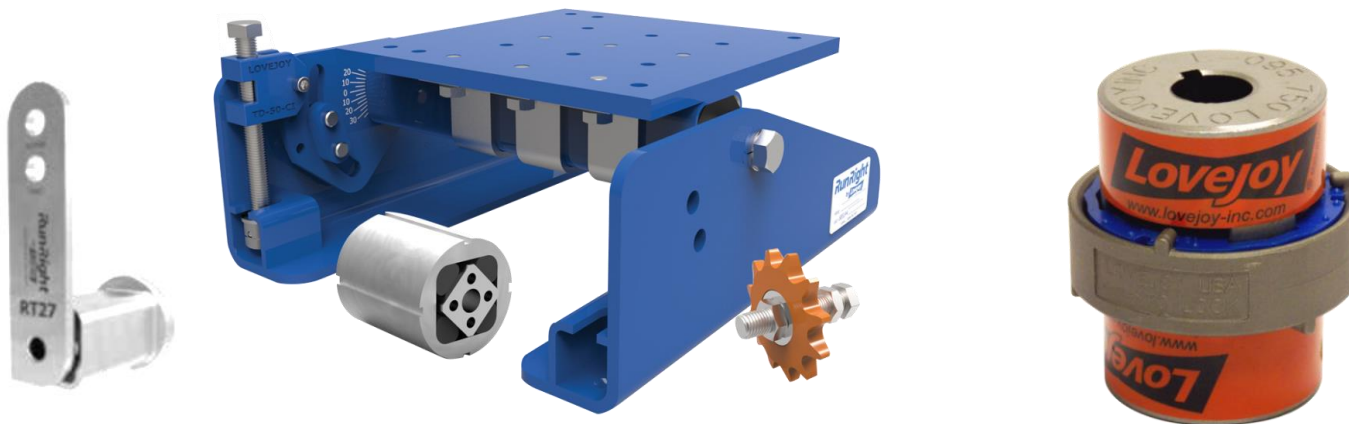
- Features corrosion resistance for applications subject to high moisture, mildly caustic, acidic environments
- Allow fewer chain replacements resulting in lower total costs of operations
- Keep the same working loads as carbon-steel chains
- Are fully interchangeable with carbon-steel ANSI chains
- Have a full variety of sizes and configurations
- Are available with chrome pin for increased wear life



Couplings

RunRight® and Jaw In-Shear Couplings

- Chain and belt tensioners available for a wide variety of sizes
- Tensioning Motorbase options available for both NEMA and IEC motor frame sizes
- Offers a variety of vibration dampening solutions for food processing and aggregate applications



Lubrication Systems

AXL

- Multi-line system
- Plug-and-Play kit
- Ideal for equipment lubrication (up to 36 points, 10m line length)



TIMKEN

Twin Engineered System

- Parallel system
- Custom engineered
- Flexibility to add points
- Long line ~100



Single Point Lubricators

- M-Power single-point lubricators provide lubrication to bearings, chain and other components.
- Addresses unexpected downtime.



Rotalube

- Chain lubrication – applies the right amount at the right place
- Subset system solutions



Stronger. By Design.

Resources

Sell Sheets

[Timken® Corrosion-Resistant Poly-Round® Plain Bearing Housed Units](#)

[Timken® Corrosion-Resistant Ball Bearing Housed Units](#)

[Timken® Hygienic Ball Bearing Housed Units](#)

[Timken® Hygienic Poly-Round® Housed Units](#)

[Timken® Corrosion-Resistant Deep Groove Ball Bearings](#)

Catalogs

[Timken® Corrosion-Resistant Ball Bearing Housed Units Catalog](#)

[Timken® Corrosion-Resistant Poly-Round® Plain Bearing Housed Units Catalog](#)

[Timken® Corrosion-Resistant Deep Groove Ball Bearing Catalog](#)

Other Resources

[CAD drawings are online](#)

[Food and Beverage Product Portfolio](#)

[Customer Success Stories](#)

[Timken.com/food and beverage](#)

[Food and Beverage trade publication placements posted on .com](#)



Sample Demo Kit
90061342 CORR-RES-MM-KIT;SMPL KIT



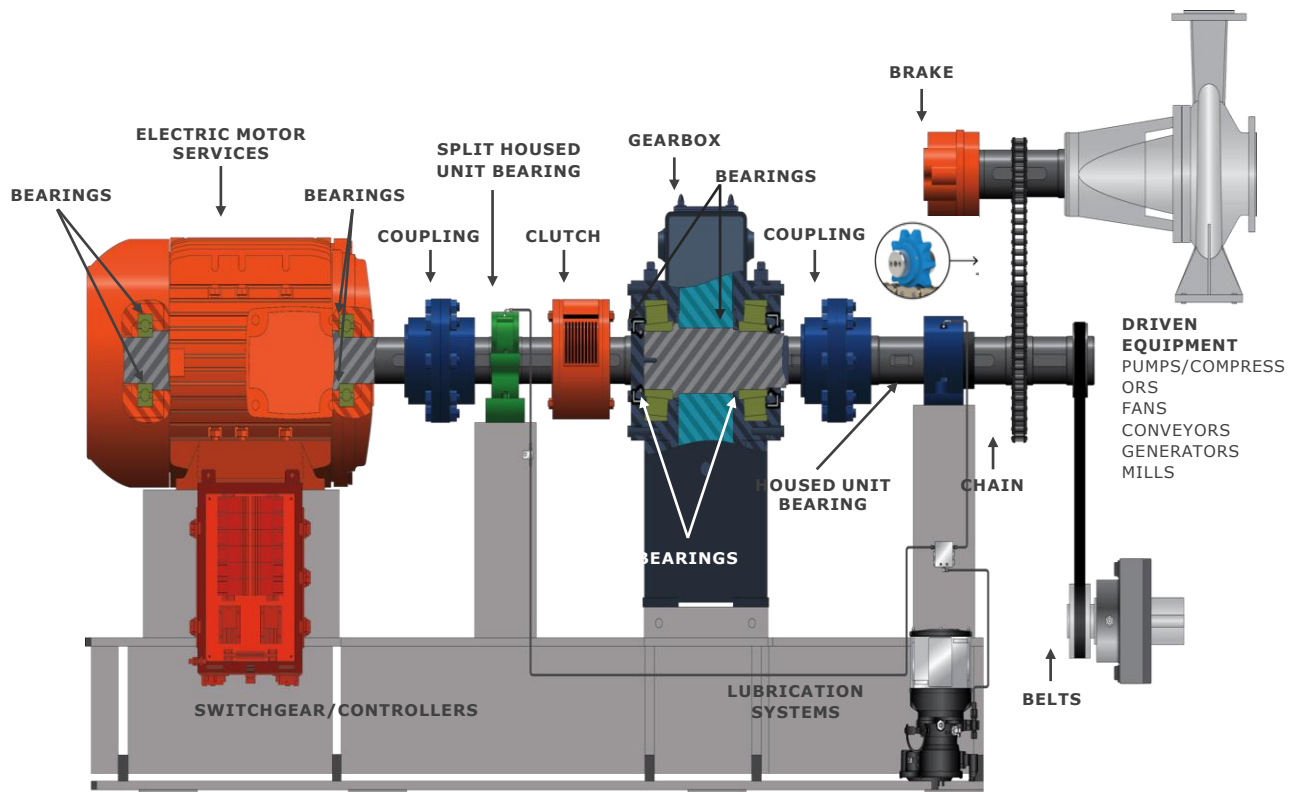
TIMKEN



Stronger. By Design.

Products for general food processing applications

Providing Expertise Across the Drivetrain





HOUSED UNIT OPTIONS INCLUDE:

- Split Block Designs
- Open and Closed Covers
- FDA Compliant Coatings
- Corrosion Resistant Offering
 - Stainless Steel
 - Hygienic

BELT DRIVEN

TIMKEN BELTS

- Synchronous Belts
- Round Belts
- V-Belts



CHAIN DRIVEN

DRIVES

- Extended Life CHP® Chain
- Silver Shield CR® Chain
- Element® Roller Chain specifically for F&B

DIAMOND

- Duralube Live w/ available Food Grade Lube
- Pin-Oven Chain

LOVEJOY

- Stainless Steel RunRight Chain Tensioner



COUPLINGS (ELASTOMERIC INSERTS AVAILABLE AS METAL AND OPTICALLY DETECTABLE; MOST STYLES AVAILABLE IN STAINLESS STEEL)



4-BOLT FLANGE ROLLER HOUSED UNITS (AVAILABLE WITH FDA COMPLIANT COATINGS)



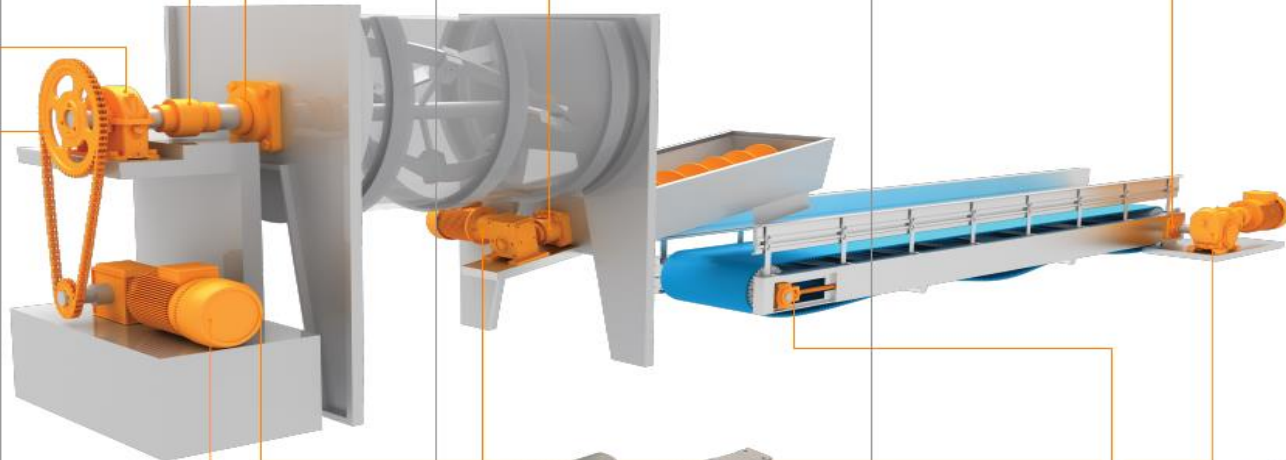
POLY-ROUND® PLAIN BEARINGS IN A HYGIENIC STAINLESS STEEL HOUSING



POLY-ROUND® PLAIN BEARINGS IN A HYGIENIC BLUE HOUSING



CORROSION-RESISTANT BALL BEARINGS AVAILABLE IN STAINLESS STEEL AND POLYMER HOUSINGS (QUIKLEAN® AVAILABLE FOR BOTH, AVAILABLE WITH SOLID LUBRICATION)



CORROSION-RESISTANT DEEP GROOVE BALL BEARINGS (AVAILABLE WITH SOLID LUBRICATION)



CONE DRIVE F-SERIES HYGIENIC, IP-69K RATED, NSF APPROVED STAINLESS STEEL GEARBOXES



CONE DRIVE B-SERIES











WIDE SLOT TAKE UP UNIT AND FRAME (AVAILABLE WITH TOP PULL TAKE UP UNIT AND FRAME)



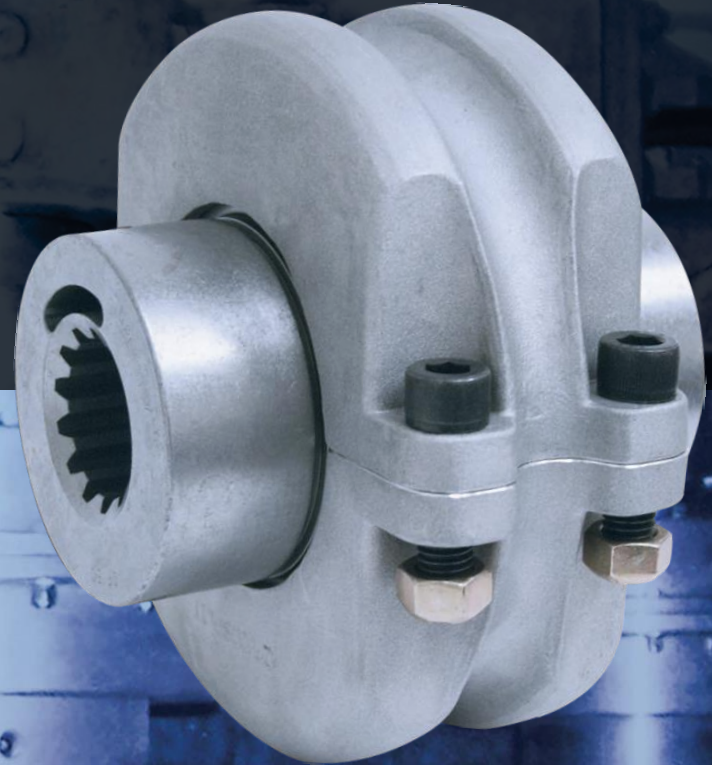
STAINLESS STEEL TAKE UP UNIT AND FRAME

Timken Housed Unit Portfolio

Ball Housed Units		Roller Housed Units				Food & Beverage Housed Units	
Solid block		Split block		Solid block		Polymer / Stainless Steel block	
Y-Series	UC-Series	Solid Bearings	Split Bearings	Spherical Bearings	Tapered Bearings	Ball Bearings	Plain Bearings
							
Fafnir® wide inner ring bearing housed unit	UC Type metric wide inner bearing housed unit	SNT metric plummer blocks & SAF pillow blocks	Split cylindrical roller bearing housed unit	Solid block spherical roller bearing housed unit	Type-E tapered roller bearing housed unit	Stainless steel ball bearing and housed unit	Bearing with polymer housing

PT solutions

Couplings



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What are the products for this market – bearings and MPT - Couplings



Features

- Minimal downtime
- Flexible shaft coupling
- Designed to operate in most applications
- Minimize inventory

Benefits

- Optimizes quick change of insert
- Requires no lubrication
- Accommodates all types of shaft misalignment
- Dampens vibration and shock loads
- Low to high torque
- Low to high speed
- Small to large size range
- Standardization
- Replaceable insert



Couplings

Specifications & Offering:

- Size offering
 - 11 different series ranging in size
 - From 11 mm (1/2 in.) to 285 mm (11-1/4 in.)
- Torque ratings
 - Continuous torque handling
 - From 43 Nm (377 in-lbs.) to 190,140 Nm (1,670,826 in-lbs.)
- Temperature ratings
 - Ability to handle temperatures
 - From -51oC to 176oC (-60oF to 350oF)



Standard Coupling:

Shown with high-speed cover



Single-Ended Spacer Coupling:

Shown with low-speed split cover



Double-Ended Spacer Coupling:

Shown with high-speed split cover



Splined Hub Coupling:

Shown with high-performance split cover

What are the products for this market – bearings and MPT – Quick Flex®



Quick-Flex® elastomeric couplings are durable enough to face the challenges of harsh environments, yet need minimal maintenance. They are easy to install and require no lubrication.

Consists of main 4 components

- Drive hub
- Driven hub
- Elastomeric insert
- Cover

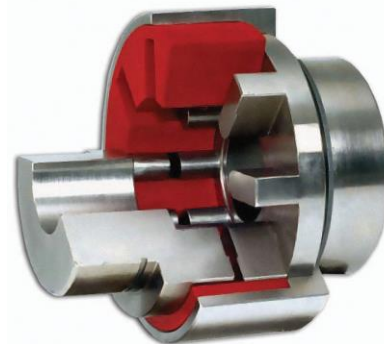
10mm shaft to 280mm
3/8" shaft to 11-1/4"



What are the products for this market – bearings and MPT

Quick Flex®

- 15 sizes QF
- 5 to QF30000
- QF5 standard hub is stainless steel 303 material
- Other sizes specify stainless
- Cover is 303
- Metric and Inch bore sizes available



	Red	Blue (B)	Black (T)	White (H)
Torque	Low	Medium	High	Medium
QF500 (In.-lbs)	75,114	144,372	219,429	144,372

What are the products for this market – bearings and MPT



Jaw Couplings

- Jaw Type Couplings
 - Require no lubrication
 - Fail safe with no metal-to-metal contact
 - Resistant to oil, dirt, sand, moisture and grease
- Jaw In-Shear Couplings
 - Fast and easy assembly and element replacement
 - 2-degree angular misalignment
 - Radially removable insert
 - Jaw hubs, rings and elements available from stock
 - No tools needed to change element



What are the products for this market – bearings and MPT



Jaw In-Shear Coupling With Stainless Steel Hubs

- Utilizes standard stainless Jaw type hubs with unique elastomer
- 1 urethane insert comparable torque rating to urethane (blue)
- Cover = #347 case stainless steel
- Twice the angular misalignment capability of standard Jaw coupling.



Jaw In-Shear 6 Pin Ring
Stainless Steel



Stronger. By Design.

What are the products for this market – bearings and MPT



Standard Stainless Steel Type Jaw Couplings

- 5 sizes available from SS075 (0.25") through SS150 (1.5")
- 4 different spider materials available: Bronze, white, blue and black
- Stainless steel 303 material
- Metric and Inch bore sizes available



Spider Performance Data

Chart 2

Characteristics	Temperature Range	Misalignment		Shore Hardness ¹	Dampening Capacity	Chemical Resistance ²	Color
		Angular Degree	Parallel Inch				
SOX (NBR) Rubber – Nitrile Butadiene (Buna N) Rubber is a flexible elastomer material that is oil resistant, resembles natural rubber in resilience and elasticity and operates effectively in temperature range of -40° to 212° F (-40° to 100° C). Good resistance to oil. Standard elastomer. (Also applies to SXB Cushions.)	-40° to 212° F -40° to 100° C	1°	.015	80A	HIGH	GOOD	BLACK
URETHANE – Urethane has greater torque capability than NBR (1.5 times), provides less dampening effect, and operates at a temperature range of -30° to 160° F (-34° to 71° C). Good resistance to oil and chemicals. Not recommended for cyclic or start/stop applications.	-30° to 160° F -34° to 71° C	1°	.015	55D L050-L110 90-95A L150-L225	LOW	VERY GOOD	BLUE
HYTREL® – Hytrel is a flexible elastomer designed for high torque and high temperature operations. Hytrel can operate in temperatures of -60° to 250° F (-51° to 121° C) and has an excellent resistance to oil and chemicals. Not recommended for cyclic or start/stop applications.	-60° to 250° F -51° to 121° C	1/2°	.015	55D	LOW	EXCELLENT	TAN
BRONZE – Bronze is a rigid, porous oil-impregnated metal insert exclusively for slow speed (maximum 250 RPM) applications requiring high torque capabilities. Bronze operations are not affected by extreme temperatures, water, oil, or dirt.	-40° to 450° F -40° to 232° C	1/2°	.010	—	NONE	EXCELLENT	BRONZE

What are the products for this market – bearings and MPT

Stainless Steel Universal Joints

- Available in 5 sizes: D-4SS to D-12SS
- Round, Hex, Splined, or keyway bores available
- Made from 303 stainless steel material
- Boot and retaining grooves are standard

Size		OAL In	E Main Pin Height In	C Bore Depth In	Std Bore In	ID1 - ID2					
						Max Bore No Keyway		Max Bore with Keyway		Max Square/ Hex Hole ³	
						In	mm	In	mm	In	mm
D-4SS	D-4SSB	2.68	1.34	.88	.38	.62	15	.44	11	.38	9
D-6SS	D-6SSB	3.38	1.68	1.00	.50	.75	19	.56	13	.50	12
D-8SS	D-8SSB	3.75	1.88	1.06	.62	1.00	25	.75	18	.62	15
D-10SS	D-10SSB	4.25	2.12	1.18	.75	1.12	28	.88	21	.75	19
D-12SS	D-12SSB	5.44	2.72	1.50	1.00	1.50	38	1.19	30	.88	22

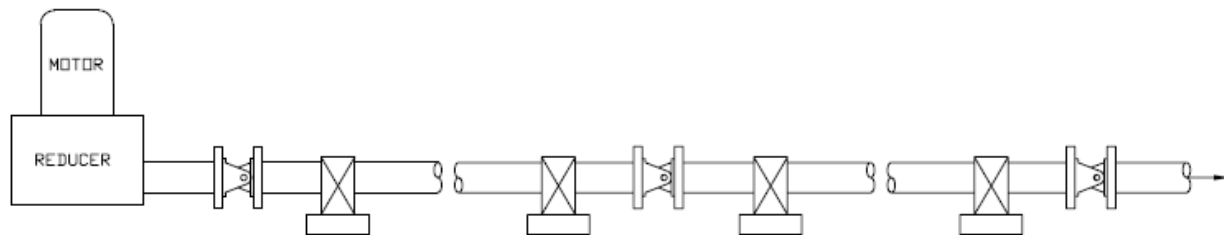


What are the products for this market – bearings and MPT



Specialty Stainless Couplings: Deltaflex

- Maintenance-free, no lubrication
- Angular misalignment capabilities to 6°
- Zero backlash design
- Eliminates premature bearing & seal failure resulting from misalignment forces
- Applications include Cereal (Grinders, Can-Filling, Bottling)

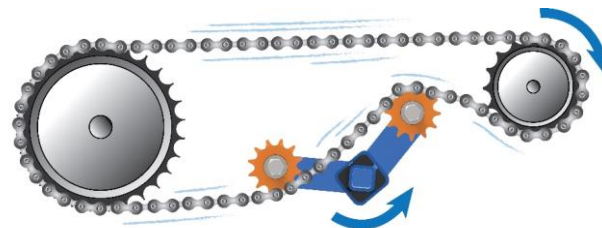


What are the products for this market – bearings and MPT

RunRight® Stainless Steel Belt & Chain Tensioners

- Chain and belt tensioners available for a wide variety of sizes
- Tensioning Motorbase options available for both NEMA and IEC motorframe sizes
- Offers a variety of vibration dampening solutions for food processing and aggregate applications

- Self-Tensioned for Maintenance-Free Operation
- Increases Belt & Chain Life by as Much as 30%
- Constant Proper Tension = Reduced Downtime
- Reduces Noise Levels by Absorbing Shock/Vibration



TIMKEN

Stronger. By Design.

What are the products for this market – bearings and MPT



Metallic Couplings

- Canning and bottling machinery common designs are gear and disc
- Non-wash down areas since drives are shielded



What are the products for this market – bearings and MPT



S-Flex

- Dampens vibration and controls shock
- Double engagement
- Easy installation
- Lubrication-free
- Maintenance-free
- Torsionally soft



What are the products for this market – bearings and MPT



Disc Couplings

- Power-intensive, high-speed and non-lubricated
- A wide variety of engineered solutions
- Most advanced disc pack design in the industry



What are the products for this market – bearings and MPT



Silver Shield CR® Chain

- Features corrosion resistance for applications subject to high moisture, mildly caustic, acidic environments
- Allow fewer chain replacements resulting in lower total costs of operations
- Keep the same working loads as carbon-steel chains
- Are fully interchangeable with carbon-steel ANSI chains
- Have a full variety of sizes and configurations
- Are available with chrome pin for increased wear life



What are the products for this market – bearings and MPT



Nickel Plated Chain

- Corrosion resistant in high moisture area
- Long-lasting for fewer chain replacements
- Optional chrome pin for increase wear life
- Fully interchangeable with carbon-steel ANSI chain
- Wide range of sizes, configurations
- Available with attachments



What are the products for this market – bearings and MPT



Stainless Steel Chains

- 3 Types of Stainless chain
 - AS series 600SS round parts with 300SS link plates
 - PS – All 304SS
 - NS – All 316 SS
- Complete product offering to address any type of application
 - Corrosion resistant
 - Extreme temperatures
- Wide range of sizes, configurations
- Available with attachments



What are the products for this market – bearings and MPT



Drives® Extended Life CHP® Chain

- Exceptional pin wear resistance reduces chain elongation and can increase wear life up to three times more than conventional premium chains
- Can be used in conjunction with Silver Shield CR or stainless Steel chain
- Fully interchangeable with carbon-steel ANSI chain
- Wide range of sizes, configurations
- Available with attachments



What are the products for this market – bearings and MPT



Drives® Engineered Class Chains

- Chains designed specifically for an application in the food and beverage industry
- Available in Carbon steel, Silver Shield and stainless



What are the products for this market – bearings and MPT

Subset equipment solutions

- Synchronous belts
- Heavy-duty industrial belts
- Specialty belts

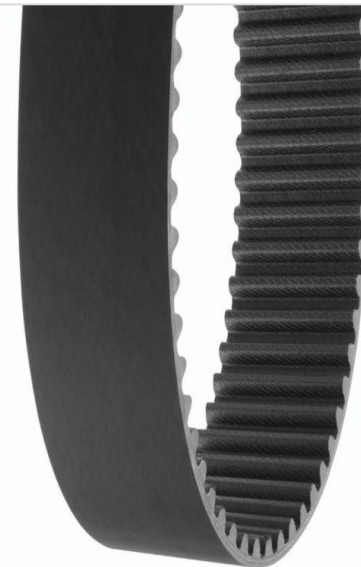


What are the products for this market – bearings and MPT

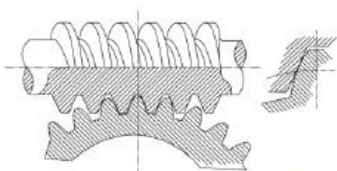
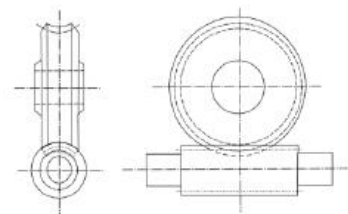


Panther XT Synchronous Belts

- Provide a powerful alternative to chain
- Increase durability thanks to carbon fiber cord construction with high tensile strength and minimal stretch
- Engineered to run quietly and efficiently in harsh environments
- Deliver high thermal stability and overall chemical resistance
- Reduce noise when compared to chain or polyurethane belts
- Outlive most competitors, as seen in tests

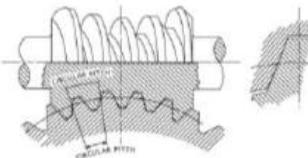
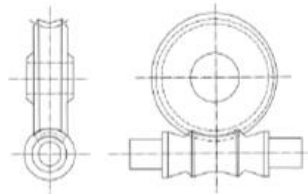


Gear Technology For Food and Beverage



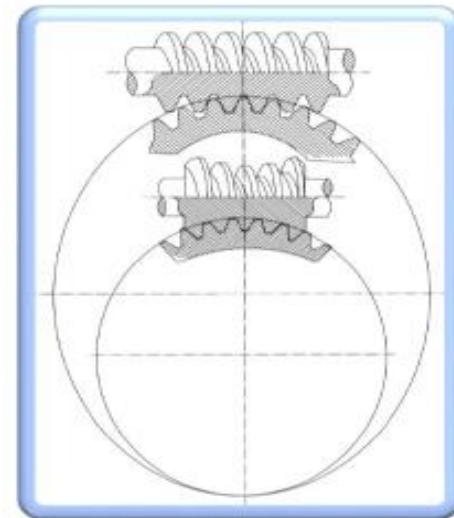
Single Enveloping

- 1–2 Teeth Engaged
- Lower Load Capacity
- Higher contact stress
- 200% shock capacity



Double Enveloping

- 3–8 Teeth Engaged
- Higher Load Capacity
- Lower contact stress
- 300% shock capacity



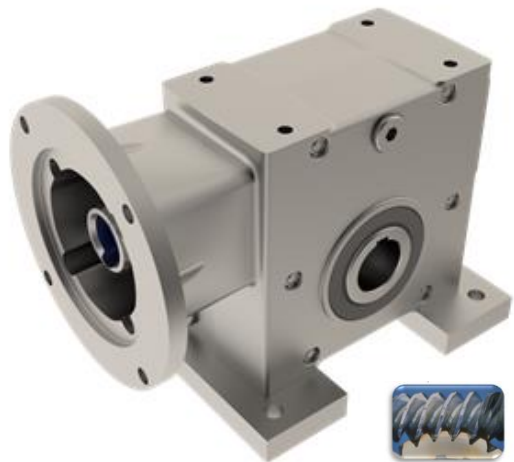
Double Enveloping Offers

More Teeth in Contact, resulting in:

- 20–30% Greater torque
- Better durability
- Higher shock load capacity
- Downsize to save space

Stronger. *By Design.*

B-SERIES



Single Enveloping

- **Suitable for F&B application without direct food contact**
- Modular product – created for distributor assembly
- Nine sizes, up to 20 HP input
- Targeted at:
 - Quick-exchange of competitors products at end-users
 - OEMs that look for a cost-efficient solution
- Aluminum construction
- **No IP rating, single seals**
- Conex single enveloping worm gearing – 200% overload

B-SERIES - APPLICATIONS

F&B applications without direct food contact



Packaging Food:

- Conveyors
- Mixers



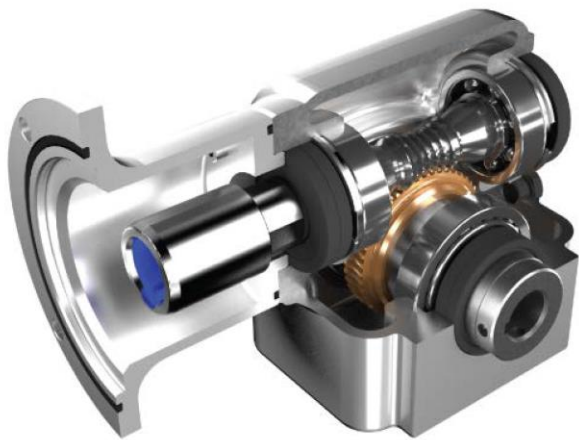
Material Handling:

- Rack and Pinion
- Palletizers



TIMKEN

F-SERIES



- **Designed to be in the middle of direct food contact (wet environments)**
- NSF and A3 approved
- Stainless steel construction with surface smoothness and down-shape surfaces. Stainless output shaft
- Applications: cutting, slicing, dicing, blending, mixing, sorters, peelers, etc.
- 5 sizes, up to 13 HP input
- **Double sealed, IP69K rating (protection from ingress & close range pressure wash-down)**
- Double enveloping worm gearing – 300% overload → cope with shock loads in e.g. bacon slicers



Double Enveloping



TIMKEN

F-SERIES - APPLICATIONS



Designed to be in the middle of direct food contact (wet environments)

Food processing, beverage processing, packaging:

- Conveyors
- Cutting, Slicing and Dicing
- Blending and Grinding
- Sorters, Peelers and Splitters
- Fillers and Extractors
- Agitators
- Mash Mixers
- Fermentation Tanks



Rollon Plus System for Packaging



Plus System

High performance linear actuators with steel re-enforced driving belt transmission. They have a high level of protection.

Features:

- High working cycles
- High protection for dirty environments
- Available with fixed carriage and movable profile for Z
- High dynamics: $V=5 \text{ m/s}$, $A= 50 \text{ m/s}^2$
- Anti-corrosion version available with stainless steel co
- High repeatability accuracy: $\pm 0,05 \text{ mm}$



<https://www.rollon.com/US/en/applications/8-packaging-and-logistics/21-bottle-palletizing-line/>
<https://www.rollon.com/US/en/applications/8-packaging-and-logistics/22-packaging-line/>
<https://www.rollon.com/US/en/applications/8-packaging-and-logistics/23-filling-line/>

Rollon Telescopic Rail for Packaging



Telescopic Rail

Heavy duty telescopic rails with hardened raceways for extractions up to 150%. Available in stainless steel with different shapes according to load capacity and rigidity required. *Update coming from Rollon*

Features:

- Long life thanks to hardened raceways
- High loads up to 3.800 Kg. per pair of guides
- Extractions up to 150%
- Safe solutions with locking and damping systems
- Suitable for automation with rack and pinion synchronization available
- Low deflection due to sturdy profiles
- Wide range of anticorrosion surface treatments



Rollon X-Rail for Packaging



X-Rail

Linear bearings with bended C-profile. Available in zinc-plated steel, stainless steel or hardened with Rollon NOX treatment.

Features:

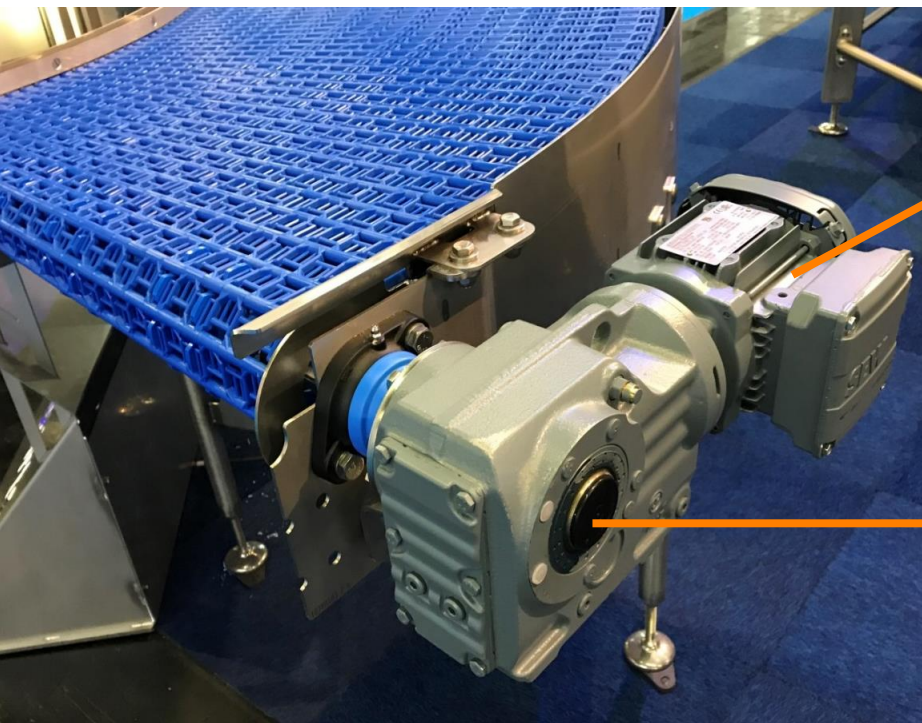
- Cost effective bended steel profiles
- Available with Rollon NOX hardening process
- Simple mounting
- Anticorrosion – stainless steel version
- Optimal reliability in dirty environments
- Self-aligning system



<https://www.rollon.com/US/en/applications/8-packaging-and-logistics/21-bottle-pallettizing-line/>
<https://www.rollon.com/US/en/applications/8-packaging-and-logistics/22-packaging-line/>
<https://www.rollon.com/US/en/applications/8-packaging-and-logistics/23-filling-line/>

Subset system solutions

Subset Equipment: Geared Motors



Available Timken products for geared motors:



BALL BEARINGS



TAPERED ROLLER BEARINGS



SPHERICAL ROLLER BEARINGS

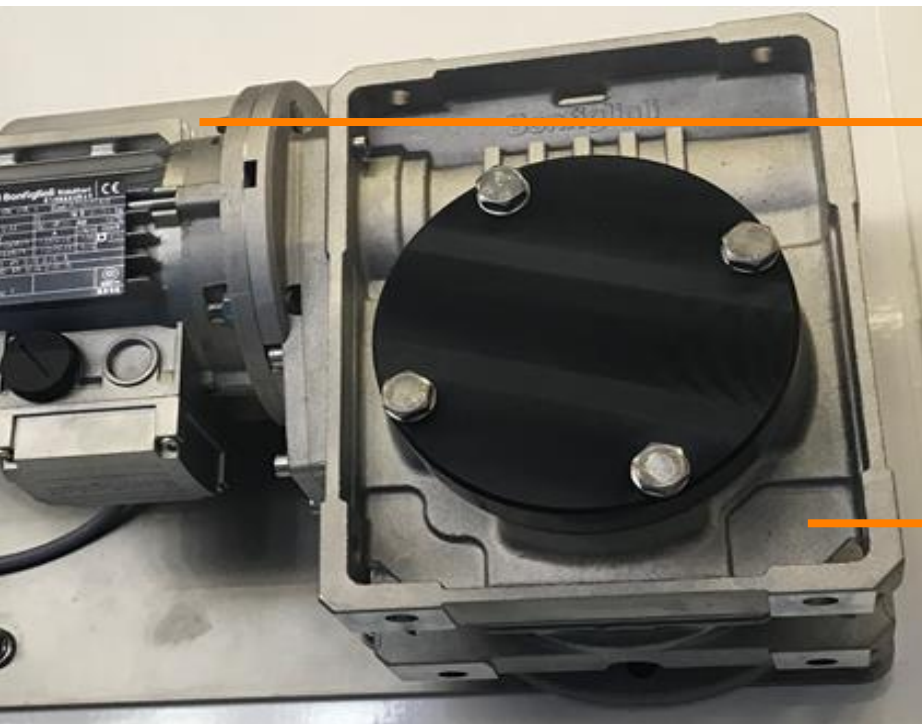


CYLINDRICAL ROLLER BEARINGS



BALL BEARINGS

Subset Equipment: Worm Gearboxes



Available Timken products for geared motors:



BALL BEARINGS

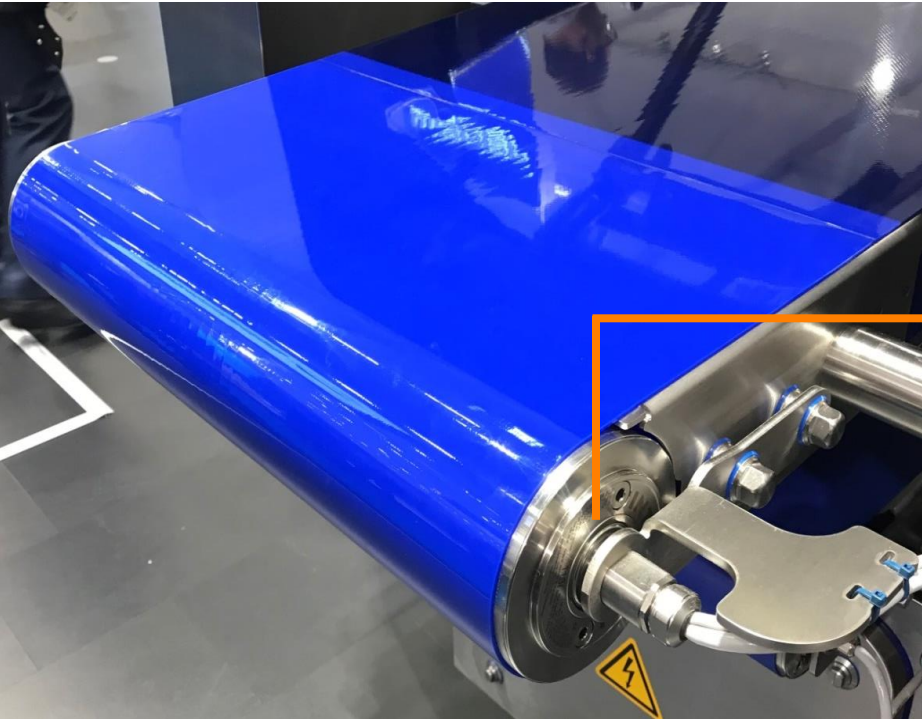


TAPERED ROLLER BEARINGS



BALL BEARINGS

Subset Equipment: Drum Motors



Available Timken products for geared motors:



BALL BEARINGS



CYLINDRICAL
ROLLER BEARINGS

Subset Equipment: Electric Motors

Available Timken products for electric motors:

- Deep Groove Ball Bearings
- Angular Contact Ball Bearings
- Cylindrical Roller Bearings



Customer Success Story

Fewer Fan Failures with Timken Split CRB

INDUSTRY/APPLICATION

Food and Beverage Pet Food Overhung Fan

CHALLENGE

Frequent failures in an overhung fan application led to significant repair and replacement requiring a crane to remove the pulley drive mounted on the shaft and taking three days

TIMKEN SOLUTION

Timken® Split Cylindrical Roller Bearing Housed Unit, providing excellent contamination prevention, and simplified maintenance and installation.

RESULTS THAT MATTER

- Superior contamination prevention
- Reduced maintenance and replacement needs
- Improved reliability and performance



Chain Life Doubled, Maintenance Minimized with Timken

INDUSTRY/APPLICATION

Food and Beverage Dry Mill

CHALLENGE

Frequent, continuing drive chain failure due to grain dust abrasion led to short wear life and continuous need for replacement

TIMKEN SOLUTION

Timken Drives® Extended Life CHP® roller chain, featuring a harder wear surface ideal for dry, abrasive environments.

RESULTS THAT MATTER

- Doubled wear life in drive chain
- \$19,000 in annual savings.
- Minimized replacement and maintenance needs



Drive Chain Upgrade Leads to Major Savings

INDUSTRY/APPLICATION

Food and Beverage Potato Chip Manufacturer

CHALLENGE

Frequent roller chain failure due to premature elongation resulted in ongoing maintenance challenges. For food safety reasons, the roller chain can't be lubricated.

TIMKEN SOLUTION

Timken Drives® Extended Life CHP®

RESULTS THAT MATTER

- Tripled roller chain lifespan
- Minimized maintenance needs
- Nearly \$99,000 in annual savings



Timken Helps Beat the Heat with Custom Solutions

INDUSTRY/APPLICATION

Food and Beverage Hot Oven Conveyor

CHALLENGE

Frequent chain failure causing replacement every six months leading to ballooning annual maintenance costs.

TIMKEN SOLUTION

Timken Drives Chain

RESULTS THAT MATTER

- Chain life extended to 16 months
- Minimized maintenance and replacement
- More than \$60,000 in annual savings



Timken Improves Reliability, Productivity with Split CRB

INDUSTRY/APPLICATION

Food and Beverage Vertical Bucket Elevator

CHALLENGE

Frequent bearing-related breakdowns due to rain water and washdown cycles led to bearing failure within weeks of each new installation

TIMKEN SOLUTION

Timken® Split Cylindrical Roller Bearing Housed Units, a single-split rubber seal and higher-performance lubrication grease.

RESULTS THAT MATTER

- Increased uptime and productivity
- Reduced maintenance costs
- Boosted confidence in bearing performance and interchangeability



Timken Solution Keeps Lines Running

INDUSTRY/APPLICATION

Food and Beverage Fan/Oven

CHALLENGE

Plummer block arrangement on a fan located above an oven experienced premature bearing failure caused by dust, inadequate sealing and, contamination. High oven temperatures restricted access to fan bearings causing a complete line stoppage.

TIMKEN SOLUTION

Timken® Split Cylindrical Roller Bearing Housed Units with a DuPont™ Kevlar® package-sealing arrangement to create a superior sealing solution

RESULTS THAT MATTER

- Reduced downtime
- Reduced maintenance costs
- Increased efficiency
- Increased performance

TIMKEN



TIMKEN CASE STUDY

Stronger. By Design.

Two Customers, One Timken Solution

INDUSTRY/APPLICATION

Food and Beverage Malting Operation Kiln Fan

CHALLENGE

Frequent bearing failures on a kiln fan, that controls the temperature in a steeping vessel. A plummer block arrangement supporting the fan shaft caused major issues when bearings needed replaced, added up to major downtime for the customer.

Another customer, also experienced significant downtime when the kiln fan bearings needed to be replaced. The drive and non drive bearings were trapped behind an impeller, a pulley and a belt taking one to two days and a complicated process to replace them.

TIMKEN SOLUTION

Timken® Split Cylindrical Roller Bearing Housed Units

RESULTS THAT MATTER

- Increased efficiency
- Lower bearing replacement cost
- Increased productivity and performance
- Reduced downtime

TIMKEN



TIMKEN CASE STUDY

Stronger. By Design.

Breakdowns Eliminated, Maintenance Mitigated for Potato Processor

INDUSTRY/APPLICATION

Food & Beverage French Fry/Potato Conveyor System

CHALLENGE

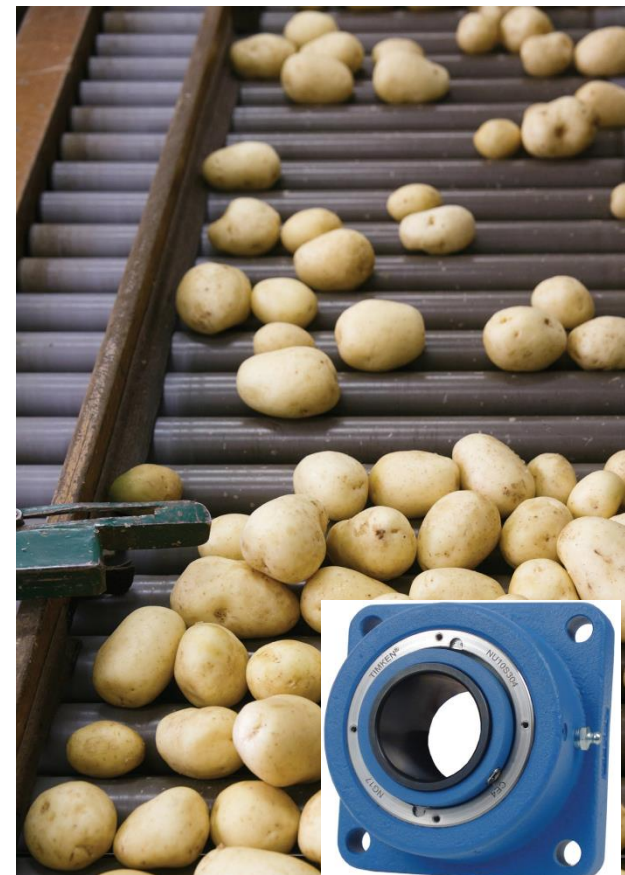
Frequent bearing failure led to unacceptable downtime and maintenance requirements. French Fry producer only saw 2-6 weeks of acceptable performance

TIMKEN SOLUTION

Timken® Spherical Roller Bearing Solid-Block Housed Unit with food-grade grease-filled urethane cover

RESULTS THAT MATTER

- Longer bearing life
- Minimized maintenance
- Maximized uptime



Poly-Round® Gets Major Food Processor Out of a Pickle

INDUSTRY/APPLICATION

Food & Beverage Pickle Processor Conveyor System

CHALLENGE

Constant bearing failure and lubrication issues necessitated continued replacement and heightened maintenance costs

TIMKEN SOLUTION

Poly-Round® Bearings incorporates lubrication into its composition and is highly corrosion-resistant

RESULTS THAT MATTER

Excellent corrosion resistance

Minimized maintenance and replacement

Savings of \$40,000 and counting



Animal Feed Supplier Seizes Savings with Timken Solution

INDUSTRY/APPLICATION

Food & Beverage Animal Feed Production

CHALLENGE

Experienced numerous operational issues related to contamination and frequent lubrication challenges. Faced need for unorthodox chain lengths when replacement was required.

TIMKEN SOLUTION

Drives® Extended Life CHP® Chain to actively fight against wear and elongation in harsh conditions with custom cut-to-length services

RESULTS THAT MATTER

- Reduced maintenance and lubrication requirements
- Eliminated regular maintenance requirements
- Major reduction in downtime



Over \$234,000 Saved with Timken Solution for Oven Rollers

INDUSTRY/APPLICATION

Food & Beverage Oven Roller Application

CHALLENGE

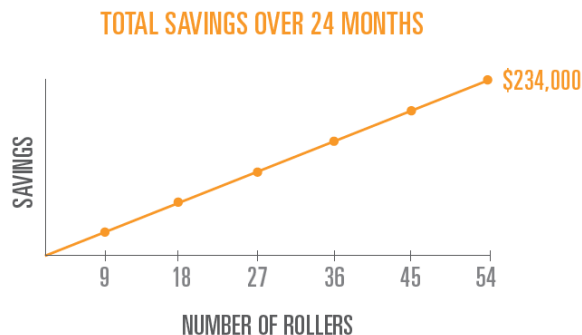
Weekly re-greasing and frequent bearing replacements

TIMKEN SOLUTION

Poly-Round® Plus Bearing

RESULTS THAT MATTER

- Oven roller bearing life extended from three months to 15
- Eliminated regular maintenance requirements
- Drastically reduced downtime



TIMKEN

TIMKEN CASE STUDY

Stronger. By Design.

Corrosion-Resistant Timken Solution Boosts Potato Peeler Performance

INDUSTRY/APPLICATION

Food & Beverage Potato Peeler

CHALLENGE

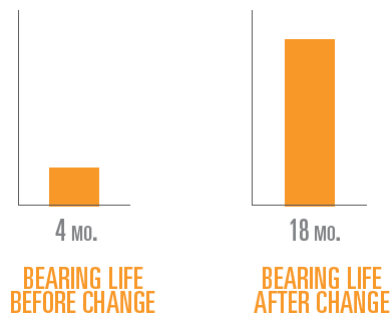
Corrosive potato starch and frequent washdown cycles interfered with lubricating grease and compromised bearing performance resulting in just 1-4 months bearing life

TIMKEN SOLUTION

EDT Peeler Bearing with nonrusting, corrosion-resistant components and no grease requirements

RESULTS THAT MATTER

- Bearing life extended from 1-4 months to 8-18 months
- Reduced maintenance
- Over \$8,000 in savings per peeler over two years



Poly-Round® Bearing Minimizes Maintenance, Saves \$130K

INDUSTRY/APPLICATION

Food & Beverage Chicken Processor Transfer Conveyors

CHALLENGE

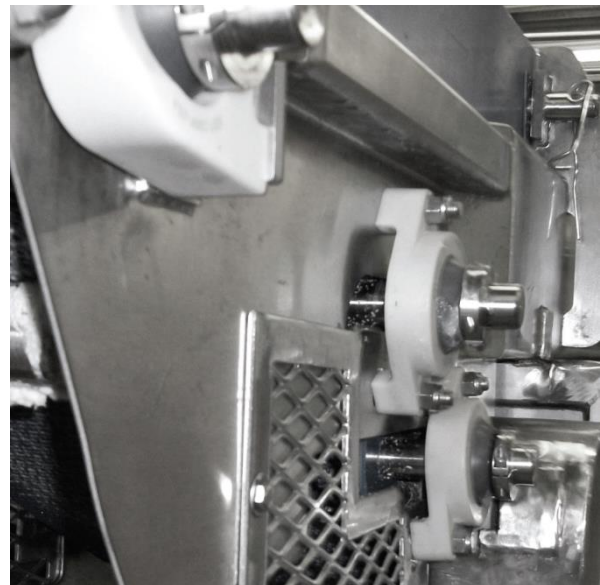
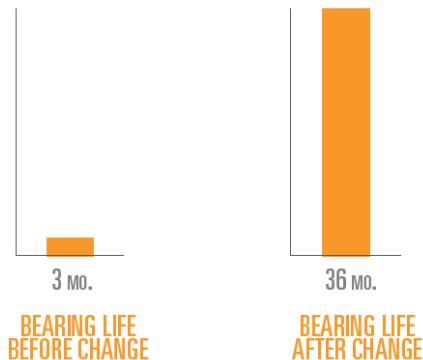
Heavy sanitizing washdown cycles compromised performance of the existing bearing, necessitating weekly re-greasing and water purging with bearings still only lasting 2-3 months

TIMKEN SOLUTION

Poly-Round® Bearing incorporates lubrication into its composition and is highly corrosion-resistant

RESULTS THAT MATTER

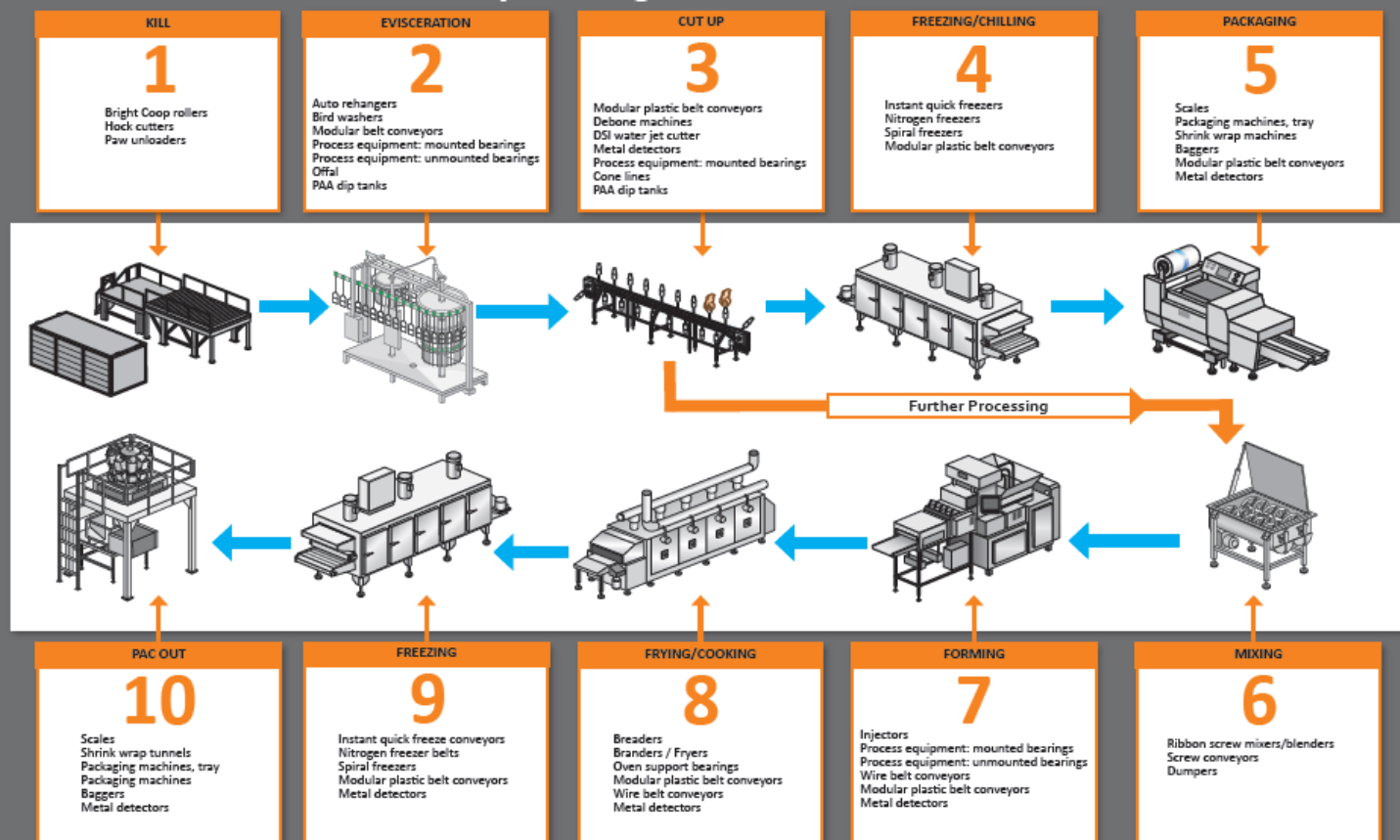
- Bearing life extended to three years
- Minimized replacement and maintenance needs
- Total savings of \$130,000



TIMKEN

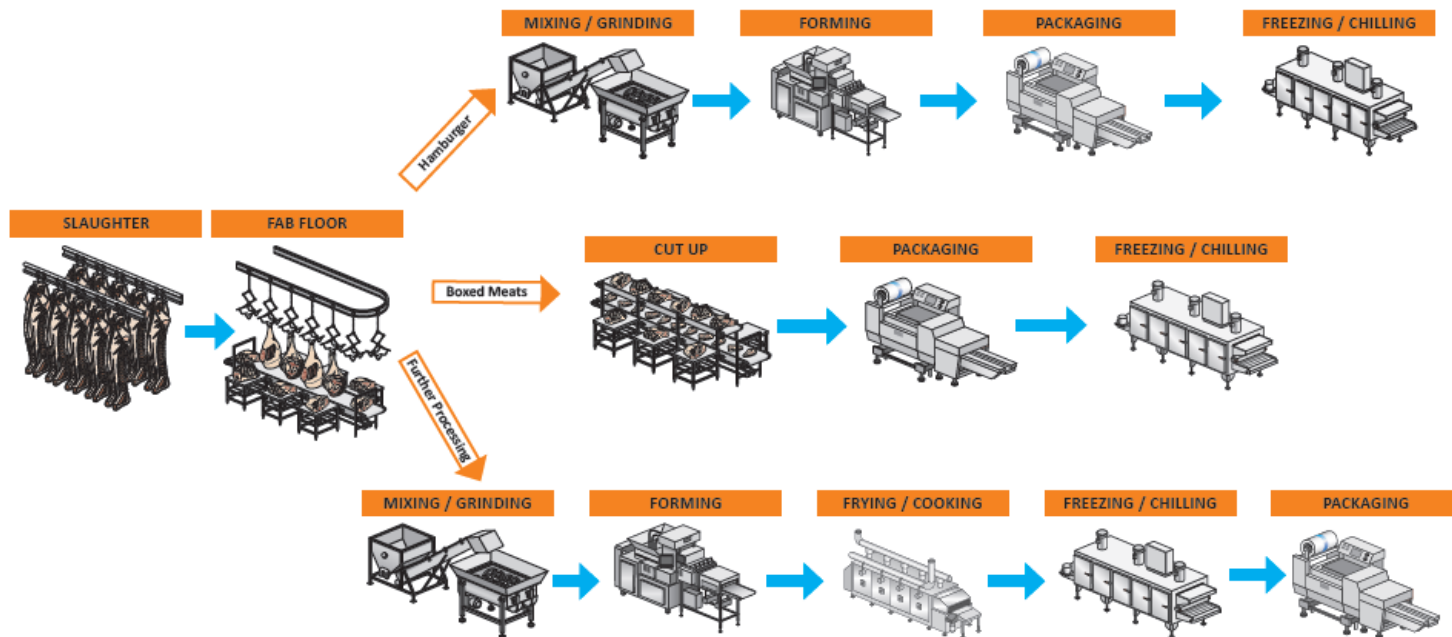
Appendix Slides – submarket specific support materials

Poultry Processing



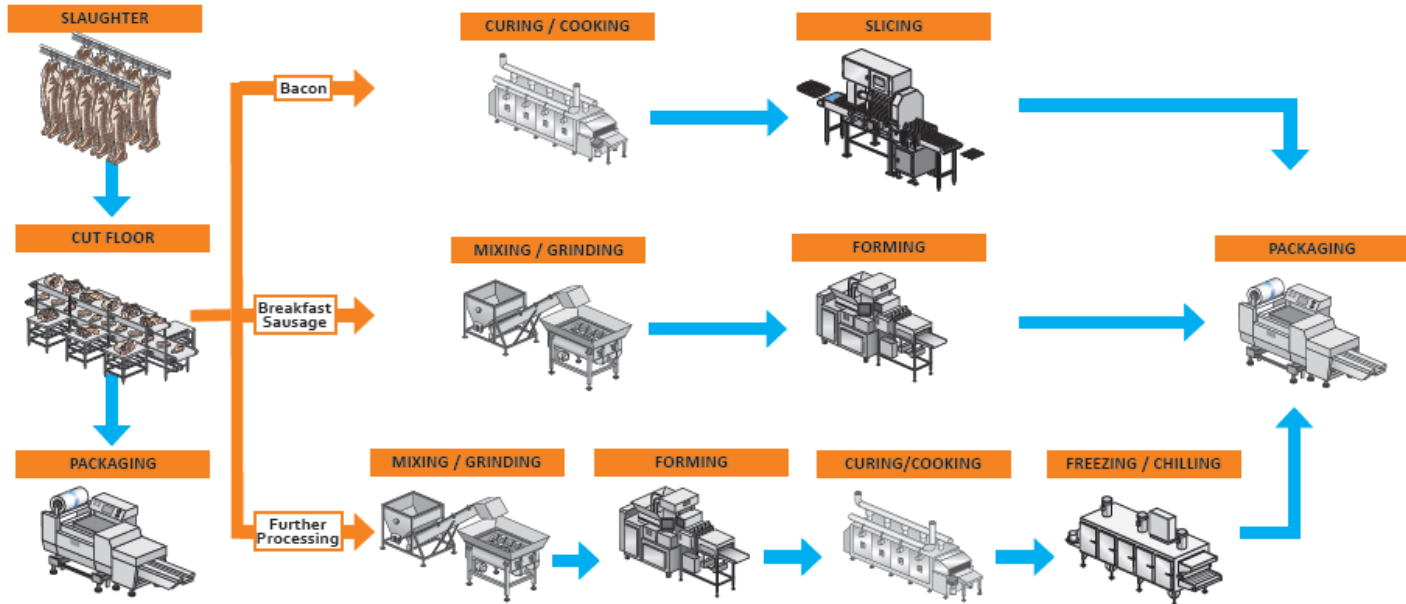
Beef Processing

SLAUGHTER	FAB FLOOR	CUT UP	MIXING / GRINDING	FORMING	FRYING / COOKING	FREEZING / CHILLING	PACKAGING
Carcass washers Blood table rollers Offal Saws Bone conveyors Mud conveyors	Saws Modular plastic belt conveyors Trim conveyors Product conveyors Sprocket driven urethane belts Bone conveyors Conveyor return rollers Metal detectors	Modular plastic belt conveyors Sprocket driven urethane belts Metal detectors	Ribbon mixers Blenders Screw conveyors Tote dumps Modular plastic belt conveyors Sprocket driven urethane belts Metal detectors	Injectors Process equipment: mounted bearings unmounted bearings Wire belt conveyors Modular plastic belt conveyors Metal detectors	Breaders Fryers Oven support bearings Wire belt conveyors Modular plastic belt conveyors Microwave ovens Branders	Nitrogen freezers Spiral freezers Wire belt conveyors Modular plastic belt conveyors Scales	Scales Packaging machines Shrink wrap tunnels Tray pack machines Vacuum sealers Check weighers Modular plastic belt conveyors Metal detectors



Pork Processing

SLAUGHTER	CUT FLOOR	MIXING / GRINDING	FORMING	SLICING	CURING / COOKING	FREEZING / CHILLING	PACKAGING
Snout pullers Hog polishers Offals	Saws Modular plastic belt conveyors Flat rubber belts Metal detectors Unsupported drive bearings Sprocket driven urethane belts Belly flatteners	Ribbon screw mixers/blenders Screw conveyors Metal detectors Dumpers	Grinders Metal detectors Stuffers Linkers Process equipment: unmounted bearings Wire belt conveyors Sprocket driven urethane belts Metal detectors	Modular plastic belt conveyors Slicers Round urethane belt conveyors Process equipment: unmounted bearings Wire belt conveyors Sprocket driven urethane belts Metal detectors	Continuous cookers Smokehouses Microwave ovens Ovens Caramelizing tables Cooling conveyors	Nitrogen freezers Spiral freezers / chillers Sprocket driven urethane belts Modular plastic belt conveyors Metal detectors	Scales Modular plastic belt conveyors Packaging machines Tray packaging machines Shrink wrap tunnels Baggers Metal detectors



Application Fit Of Timken Products

Bakery/Tortilla

	Poly-Round® Bearings	Radial Poly-Round®	Type E Solution®	Mounted Ball Bearings	Radial Ball Bearings	Solid Lubrication
Conveyors	X			X		X
Proofers	X		X	X		X
Ovens	X		X	X		X
Freezers	X			X		X
Fryers	X	X	X	X	X	X
Metal Detectors	X			X		X
Cooling Lines	X		X	X		X
Packaging Machines	X			X	X	X

Application Fit Of Timken Products

Beverage

	Poly-Round® Bearings	Radial Poly-Round®	Type E Solution®	Mounted Ball Bearings	Radial Ball Bearings	Solid Lubrication
Conveyors	X		X	X		X
Coolers	X		X	X		X
Fillers		X			X	X
Coolers/Warmers	X		X	X		X

Application Fit Of Timken Products

Breakfast Cereal

	Poly-Round® Bearings	Radial Poly-Round®	Type E Solution®	Mounted Ball Bearings	Radial Ball Bearings	Solid Lubrication
Conveyors	X		X	X	X	X
Ovens	X		X	X		X
Metal Detectors	X			X		X
Packaging Machines				X	X	X

Application Fit Of Timken Products

Confectionary

	Poly-Round® Bearings	Radial Poly-Round®	Type E Solution®	Mounted Ball Bearings	Radial Ball Bearings	Solid Lubrication
Conveyors	X			X		X
Ovens	X			X		X
Metal Detectors	X			X		X
Mixers/Blenders	X		X	X		X
Packaging Machines	X			X	X	X

Application Fit Of Timken Products

Dairy

	Poly-Round® Bearings	Radial Poly-Round®	Type E Solution®	Mounted Ball Bearings	Radial Ball Bearings	Solid Lubrication
Briner/Cooker	X			X	X	X
Bucket Scales		X			X	X
Conveyors	X		X	X		X
Filters		X		X		X
Pasteurizers	X		X	X		X
Packaging Machines	X			X	X	X
Process Equipment	X			X	X	X
Shredders				X		X
Shrink Wrap Tunnels	X			X		X

Application Fit Of Timken Products

Fruit/Vegetable

	Poly-Round® Bearings	Radial Poly-Round®	Type E Solution®	Mounted Ball Bearings	Radial Ball Bearings	Solid Lubrication
Conveyors	X		X	X		X
Single Pivot Dumpers	X		X	X		X
Bucket Scales		X		X		X
Dryers	X			X		X
Freezers	X			X		X
Cooling Tunnels	X			X		X
Cleaning Tanks	X			X		X
Peelers	X					
Sizers	X		X	X		X
Fryers	X			X		X
Breaders				X		X
Metal Detectors	X			X		X
Packaging Machines	X			X	X	X

Application Fit Of Timken Products

Poultry

	Poly-Round® Bearings	Radial Poly-Round®	Type E Solution®	Mounted Ball Bearings	Radial Ball Bearings	Solid Lubrication
Birdwashers	X	X		X	X	X
Charmarker/Brander	X			X		X
Conveyors	X		X	X		X
Metal Detectors	X			X		X
Single Pivot Dumpers	X		X	X		X
Massagers	X		X	X		X
Mixers	X		X	X		X
Ovens	X		X	X		X
Fryers	X			X		X
Packaging Machines	X	X		X	X	X
Debone Machines		X			X	X
Sizers				X	X	X
Freezers	X		X	X		X
Breaders				X		X
Shrinkwrap Tunnels	X			X		X
Bucket Scales		X			X	X
Screw Conveyors	X		X	X		X
Auto-Rehanger (Stork)		X			X	X
Offal Auger	X		X			

Application Fit Of Timken Products

Prepared Foods

	Poly-Round® Bearings	Radial Poly-Round®	Type E Solution®	Mounted Ball Bearings	Radial Ball Bearings	Solid Lubrication
Conveyors	X			X		X
Line Shaft Bearings	X		X	X		X
Blanchers	X			X		X
Mixers	X		X	X		X
Single Pivot Dumpers	X		X	X		X
Breaders				X		X
Fryers	X	X		X	X	X
Ovens	X		X	X		X
Fillers		X			X	X
Freezers	X		X	X		X
Metal Detectors	X			X		X
Packaging Machines	X	X		X	X	X
Shrink Wrap Tunnels	X			X		X

Application Fit Of Timken Products

Red Meat Beef/Pork

	Poly-Round® Bearings	Radial Poly-Round®	Type E Solution®	Mounted Ball Bearings	Radial Ball Bearings	Solid Lubrication
Carcass Washers	X		X	X		X
Conveyors	X		X	X		X
Metal Detectors	X			X		X
Single Pivot Dumpers	X		X	X		X
Massagers	X		X	X		X
Mixers	X		X	X		X
Cookers	X		X	X		X
Screw Conveyors	X		X	X		X
Ovens	X		X	X		X
Fryers	X	X		X	X	X
Slicers	X	X		X	X	X
Packaging Machines	X			X	X	X
Freezers	X			X		X
Offal Auger	X		X			
Shrink Wrap Tunnels	X			X		X

Application Fit Of Timken Products

Seafood

	Poly-Round® Bearings	Radial Poly-Round®	Type E Solution®	Mounted Ball Bearings	Radial Ball Bearings	Solid Lubrication
Blenders/Mixers	X		X			
Conveyors	X		X	X		X
Breaders				X		X
Fryers	X	X		X	X	X
Freezers	X			X		X
Metal Detectors	X			X		X
Packaging Machines	X			X	X	X
Shrink Wrap Tunnels	X			X		X

Application Fit Of Timken Products

Snack Foods

	Poly-Round® Bearings	Radial Poly-Round®	Type E Solution®	Mounted Ball Bearings	Radial Ball Bearings	Solid Lubrication
Conveyors	X		X	X		X
Sizers	X			X		X
Fryers	X	X		X	X	X
Peelers	X					
Freezers	X			X		X
Screw Conveyors	X		X	X		X
Metal Detectors	X			X		X
Single Pivot Dumpers	X		X	X		X
Ovens	X		X	X		X
Bucket Scales		X			X	X
Packaging Machines		X			X	X
Shrink Wrap Tunnels	X			X		X

Application Fit Of Timken Products

Pet Food

	Poly-Round® Bearings	Radial Poly-Round®	Type E Solution®	Mounted Ball Bearings	Radial Ball Bearings	Solid Lubrication
Bucket Scales		X			X	X
Conveyors	X			X		X
Single Pivot Dumpers	X		X	X		X
Cookers	X		X	X		X
Mixers	X		X	X		X
Retorts		X		X		X
Yamato Scales		X			X	X
Metal Detectors	X			X		X
Packaging Machines	X			X	X	X