

DORNER[®]

By Columbus McKinnon

A photograph of a food processing facility. In the foreground, three large, rectangular blocks of yellow material, possibly cheese or a food product, are wrapped in clear plastic and sit on a white perforated conveyor belt. The background shows more of the conveyor system and industrial equipment. A large blue circle with a dashed orange line is overlaid on the bottom left of the image, containing the text.

3 FACTORS TO KNOW IN FOOD PROCESSING

A Guide to Boosting Overall
Equipment Effectiveness
with Sanitary Conveyors

MAXIMIZING OVERALL EQUIPMENT EFFECTIVENESS WITH CUTTING EDGE HYGIENIC MACHINERY

In the food production industries, the effectiveness of equipment on the processing line influences efficiency. Unfortunately, if the equipment isn't performing, output decreases, and the facility's overall production suffers. There are multiple factors to account for when determining the effectiveness of equipment because it interacts with products, staff, and other production machinery.

Measuring the productivity of your manufacturing equipment and gaining insight to improve your process can be achieved through Overall Equipment Effectiveness or OEE. Essentially, OEE identifies the percentage of manufacturing time that is productive, focusing on three factors:

 **Availability**  **Performance**  **Quality**

Companies can use OEE to help them define, visualize, and eliminate losses and waste.

Measuring OEE can be particularly helpful in food production facilities, where a significant portion of the business's time and resources are dedicated to maintaining proper cleaning and sanitation. Lengthy disassembly and reassembly processes for each piece of equipment only prolong downtime during changeovers and cleaning procedures.

Throughout this ebook, you will learn how to maximize OEE in food production through the use of precision hygienic conveyors specifically designed to be low maintenance, easy to clean, and deliver quality products accurately.



MEASURING THE PRODUCTIVITY OF YOUR MANUFACTURING EQUIPMENT

It can sometimes be unclear how to measure the productivity of your manufacturing equipment. Utilizing the OEE principle allows you a standard for measuring productivity.
 $OEE = Availability \times Performance \times Quality$.

What Does this Mean?

1. Availability: What percentage of time during production hours is the piece of equipment available? This should not include any stop time.
2. Performance: What throughput speed is the equipment capable of, and what is it running at in your production line?
3. Quality: What percentage of salable products does the machine process?

Ideally, you would want your equipment to achieve a perfect score, which means your machine must manufacture 100% Availability (no stop time), 100% Performance (as fast as possible), and 100% Quality (only saleable products).

In the Food Handling and Processing Industry, sanitary stainless-steel conveyors are essential in maximizing OEE while also delivering a more sanitary platform. While these conveyors are low maintenance, they are also versatile, capable of accommodating numerous tasks, and generating a high quality and rate of throughput.

AVAILABILITY

OPTIMIZE RUN TIME

Planned production can be interrupted by human error or reduced available labor, causing increased downtimes and inefficiencies. You can optimize your runtime with cleaning and sorting accessories that automatically handle these manual tasks, thus taking the pressure off staff and freeing them up for other jobs.

Accessories Designed to Optimize Run Time

- Automatic Stops and Pacing Conveyors: Strategically space items in preparation to maximize the following process.
- Belt Scrapers: Provide continuous conveyor belt cleaning in high debris areas.
- Clean-in-Place Stationary Washers: Clean inner and outer belt surfaces quickly.
- Merging and Diverting Devices: Precise movement of product to maximize throughput into equipment or packaging.
- Depositing Retracts: Effectively transfer products to the next step in production, or quickly remove rejected product.
- Singulation or Chicaning Solutions: Automates product placement and flow for faster production or packaging.





PERFORMANCE

INCREASE PRODUCTION CAPABILITIES

Precise, hygienic conveyors can be sanitized in just a few minutes, allowing for an increase in production capabilities. Not only that, but these conveyors enable one person, without any tools, to suspend and release the belt in six seconds and disassemble the entire conveyor in less than three minutes.

Although OEE only focuses on a machine's effectiveness, the benefit of only needing one worker for a sanitation job results in an increase of overall efficiency. To illustrate this, take, for example, the following scenario:

A system runs 50% more effectively with one operator, but 65% effectively with two operators. The effectiveness goes up 30%, yet efficiency drops down to 50% based on labor.

Therefore, it's important to take the measurements of both efficiency AND effectiveness into consideration when choosing a machine. Features that reduce the labor needs of one machine while maintaining ease of sanitation include:

- Tip-up tail belt release
- Belt lifters
- Tool-less disassembly
- Belt scrapers
- Removable belt supports
- Frame cutouts
- Adjustable drive sprockets
- Clean-through belt side walls



QUALITY

INCREASE SALEABLE UNITS

Sanitary conveyors are responsible for safely processing raw, baked, and ready-to-eat foods without contamination. Because of the strict regulations hygienic designs are built to withstand high-pressure washings and are chemically resistant, which means they can be easily sanitized and used for a variety of products including:

- Dairy
- Seafood
- Meat & Poultry
- Confectionery Items & Baked Goods
- Fruits & Vegetables
- Ready-to-Eat Foods

Utilizing a conveyor that can be managed by a single worker and sanitized correctly in minutes decreases the risk of contamination and minimize waste. The increase in marketable products further boosts productivity and revenue.

Now that we know how these three components – Availability, Performance, and Quality – contribute to your machine's Overall Equipment Effectiveness, we can focus on hygienic conveyor optimization for a sustainable design.

IDENTIFYING QUALITY HYGIENIC CONVEYOR EQUIPMENT FOR ANY OPERATION

As companies scrutinize how to improve their food processing practices and stay ahead of the curve, the conclusion they often arrive at is installing a new sanitary conveyor. Taking a proactive approach toward food safety by adding safeguards to try and prevent contamination or problems from occurring in the first place is a sound decision, especially since conveyors are in direct contact with food on the processing side. When identifying quality sanitary conveyors, it is essential to find equipment built with reliable and hygienic attributes to eliminate any chance of contamination. However, not all “sanitary” conveyors are the same.

As you research sanitary conveyor systems, analyze the engineering and design attributes that make the conveyor a truly sanitary platform. Keep in mind that the ultimate goal is to achieve OEE by using precision hygienic conveyors specifically designed to be low maintenance and deliver quality products precisely.

The following questions can be considered to appropriately identify a precision hygienic conveyor that will maximize OEE while simultaneously delivering a more sanitary platform.

- Are there built-in features that will cut down cleaning time?
- Are these features removable or permanent?
- How easy is it to disassemble for cleaning?
- How many people/tools are necessary to sanitize the equipment?
- Will the design simplify the cleaning process?
- Will the product fulfill my operation’s sanitary requirements?
- Is the product approved by the required health agencies?





TAKE FOOD HANDLING CONVEYORS TO A WHOLE NEW LEVEL WITH DORNER

Dorner is improving food hygiene standards and increasing your OEE with our cutting-edge material handling machinery. Our ISO-registered systems are easy to clean and disassemble, hygienically designed, and, most importantly, safe to use.

With the only Modular USDA Red Meat & Poultry Certification and conveyors built exclusively with FDA-approved materials, Dorner helps you adhere to the highest safety standards, such as the Food Safety Modernization Act, NSF specifications, and 3-A Sanitary Standards. Additionally, our Aqua-Gard series is BISCC certified for confectionery and baked goods.

In addition to these safety measures, all products are CE-certified and RoHS-compliant because we're committed to providing safe, quality conveyor equipment for any operation.

DORNER'S **FIVE-STEP** APPROACH TOWARD FOOD SAFETY

① Hygienic Design

With Dorner's hygienic design, your specific production requirements can be achieved while meeting the most stringent sanitation requirements. Each conveyor system is certified, application-proven, and simple to sanitize. Our designs include:

- Three sanitary levels configured to your unique application.
- No areas where debris can accumulate.
- Minimal horizontal surfaces
- Smooth, completely sealed TIG-welded frame

② Easy Disassembly

The simplicity of our hygienic design decreases assembly time and increases OEE. The disassembly time required to prepare for cleaning is less than three minutes.

③ Ease of Sanitation

Our conveyors are developed with fast, tool-less access to the frame and components for twice the clean-up speed of the competition. Sanitation is simple with our removable wear strips, belt lifters, frame cut-outs, and tip-up tails.

Dorner's conveyor systems are expertly designed with an open, stainless-steel frame to optimize the cleaning process. Our patented sprocket alignment key quickly moves and realigns the sprocket to decrease sanitation time.

④ Operator Safety

Operator safety is just as important as food safety, so our conveyors are engineered and designed to industry safety standards. Our five-step approach was developed with your dedicated employees in mind, and our conveyors are engineered and designed to industry safety standards.

⑤ Integration & Automation

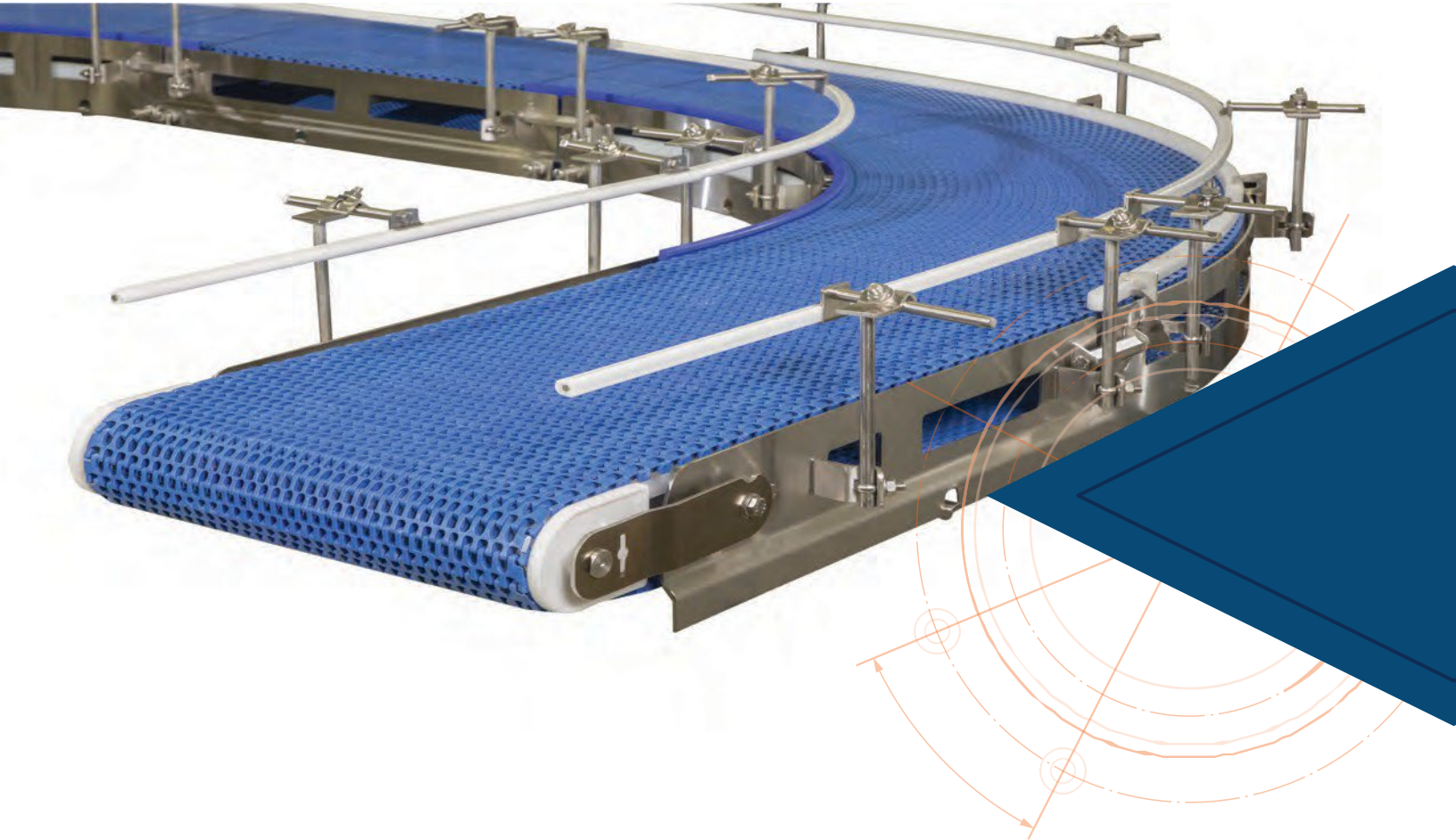
Implementing more automation helps to reduce the risk of product contamination from human error, and significantly improves the hygiene of a food processing line. Every Dorner conveyor system is designed to be easily integrated into an existing manufacturing line, and offers the accuracy needed to effectively interface with robotics.



The background image shows an industrial setting with a conveyor belt system. Several metal rollers are visible, and a blue circular graphic with a dashed orange border is overlaid in the center. The text is white and bold, with a horizontal line separating the title from the subtitle.

READY TO BOOST YOUR OEE?

Find out which
sanitary conveyor
system is best for
your operation.



WHICH SANITARY CONVEYOR IS BEST FOR MY OPERATION?

When handling and processing food, pharmaceuticals, and other highly regulated products, you need a conveyor solution that takes sanitation to the next level.

Dorner's precision hygienic conveyor lines, AquaGard and AquaPruf, are designed for fast, safe, and effective sanitation and protection from contamination. AquaPruf conveyors can disassemble in minutes for maximized uptime and productivity. Regardless of your industry, you can be confident that Dorner's Sanitary Stainless-Steel conveyors will help you achieve Overall Equipment Effectiveness.

Dorner's Sanitary Series conveyors are built for any environment. Constructed with stainless-steel frames and available in belt, modular belt, flexible chain, and positive drive belt options, including:

- Primary & Secondary Packaging
- Confectionery & Snack Foods
- Medical Supplies & Pharmaceuticals
- Fruits & Vegetables
- Raw Meat, Fish, & Poultry
- Ready to Eat Foods
- Health & Beauty
- Pet Foods



AquaGard Conveyors

Our family of AquaGard conveyors offer an array of customizable solutions.

Constructed with stainless-steel frames and FDA-approved belting and components, AquaGard Conveyors feature fast belt changes and precision tracking to maximize uptime

Series, Models, and Specifications

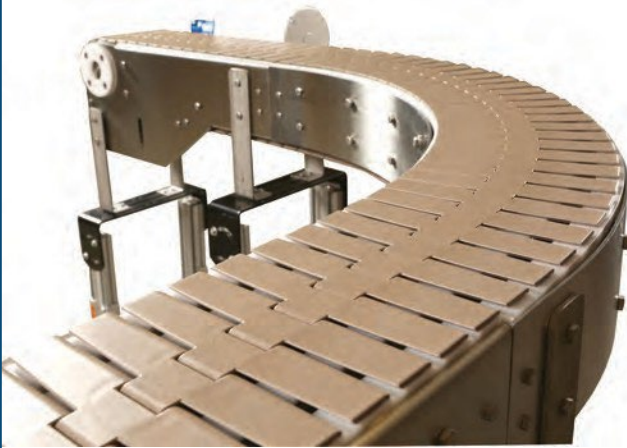
AquaGard Conveyors are available in a variety of series and models, giving you the flexibility to choose one that fits your needs—and your space.

- **AquaGard GT:** Flexible table top chain conveyors for dry food processing, bottling, and mainline conveyance. Excellent choice for long runs, tight spaces, and complex configurations.
- **AquaGard LP:** Belted conveyors for lighter-duty packaging and processing applications with intermittent wash downs and wipe down applications.
- **AquaGard 7350:** Belt, positive drive belt, and modular belt conveyors capable of straights, curves, and LPZ (Z-frame) configurations. Ideal for larger products and heavy-duty applications.

Ideal for These Industries

- Baking
- Confectionery
- Packaged goods
- Pet foods (dry)
- Secondary packaging
- Snack foods
- Beverage
- Pharmaceuticals

Each of these series offers multiple models and options to further fit your packaging, handling, and processing needs:



AquaGard GT Series Specs

- Modular belt capable of straight, curved and incline and decline configurations.
- FDA-approved belting and plastic components
- Loads up to 317 kg (700 lbs.)
- Widths: 114 mm (4.5 in) to 304 mm (12 in)
- Lengths: up to 30,480 mm (100 ft)
- 300 stainless-steel frame



AquaGard LP Series Specs

- Belted conveyor options
- Straight configurations available
- Loads up to 27 kg (50 lbs.)
- Widths: 70 mm (2.75 in.) to 457 mm (18 in.)
- Lengths: 500 mm (20 in.) to 8486 (18 ft.)
- Robust welded 304 Stainless Steel frame
- Stainless steel bearing with FDA H2 food grade grease
- FDA approved belting and plastic components



7350 Series Specs

- Belted, modular belt, and positive drive conveyor options
- Straights, curves and LPZ (Z-Frame) configurations available
- FDA-approved belting and plastic components
- Flat modular belt loads up to 341 kg (750 lbs.)
- Widths: 152 mm (6 in) to 914 mm (36 in)
- Lengths: 914 mm (3 ft.) to 25,000 mm (82 ft.)
- 304 stainless-steel frame

MADE FOR MAXIMUM UPTIME

AquaGard LP: Sleek, Low-Profile Design

With your schedule and space in mind, these conveyors were designed to fit where others cannot. The tip-up tail design allows for a five-minute belt change and makes cleaning quick and easy. Tool-less options for ease of maintenance are available, and a V-groove and V-guided belt ensure accurate tracking.

7350: Rugged & Durable Design

A 304 stainless-steel frame open design means minimal horizontal surfaces and tip-up tails allow easy access inside for cleaning and maintenance. Its chain was designed to eliminate friction, increase capacity, and maintain safety. In fact, it is the safest in the industry, with openings less than 4 mm, even on curves.

Additional Benefits of AquaGard Conveyors

Customizable Solutions

- With our engineered solutions, we can customize the series and models described here to meet your operation's individual needs.

Industry-Approved

- BISSC-certified: Our AquaGard LP and 7350 Series conveyors meet the standards set forth by the Baking Industry Sanitation Standards Committee Certifications.
- Motors and other components meet FDA standards.

Options & Accessories

Constructed with stainless-steel frames and FDA-approved belting and components, AquaGard Conveyors feature fast belt changes and precision tracking to maximize uptime.

- | | |
|------------------------------|---------------------------|
| • Nose bar transfers | • Chutes |
| • Powered transfers | • Drip pans |
| • Roller Transfers | • Hoppers |
| • Variety of guiding options | • Fully adjustable stands |



AquaPruf Conveyors

Move product along while maintaining strict sanitary requirements with AquaPruf Series Conveyors. Designed with the most stringent of food sanitation requirements in mind, these conveyors feature tip-up tails, frame cut-outs and belt lifters for fast cleaning and product changeover, quick sanitation, decreased downtime and maximized production.

Ideal for These Industries

Designed for durability, AquaPruf Conveyors suit applications that require the strictest of safety standards, including:

- Processed foods
- Raw meats & poultry
- Cheese & Dairy
- Fruits & Vegetables
- Ready-to-eat foods
- Nutraceuticals
- Pet foods (wet)



Series, Models, and Specifications

AquaPruf Conveyors are available in a variety of series and models, giving you the flexibility to choose one that fits your needs—and your space.

Our AquaPruf Series Includes:

- **AquaPruf Conveyors:** Belt, Modular, and positive drive belt conveyors with an open-frame design mean efficient cleaning for ultimate ease of care
- **AquaPruf Ultimate Conveyors:** 3A certified conveyors engineered for the utmost in food safety, such as red meat and poultry applications.
- **AquaPruf VBT:** A vertical solution ideal for bulk products, food, and pharmaceuticals.

AquaPruf Conveyors are available in a variety of series and models, giving you the flexibility to choose one that fits your needs—and your space.

Belt Options & Conveyor Configurations

Modular Series

- Flat modular belt
- Friction top
- Cleated
- Curve

Belted Series

- Flat belt
- Cleated
- Sidewall cleated
- V-guided and positive drive

Customizations & Accessories

Customize your AquaPruf conveyor system even more with options and accessories including:

- Nose bar transfers
- Belt lifters and frame cut-outs
- Belt scrapers
- Clean-in-place modules
- Chutes
- Drip pans
- Guiding
- Hoppers



AquaPruf Modular Specs

- Straights, curves, z-frame, inclines, and declines configurations available
- Loads up to 341 kg/sq m (750 lbs./sq ft)
- Widths: 150-1200 mm (5.9-47.3 in)
- Lengths: 915-25000 mm (36-984 in)
- Belt speeds up to 78.6 m/min (260 ft/min)
- TIG-welded stainless-steel frame
- FDA-approved belting and plastic components



AquaPruf Belted Specs

- Flat, cleated, and positive drive belt options in straight and z-frame configurations
- Loads up to 227 kg/sq m (500 lbs./sq ft)
- Widths: 203-1219 mm (8-48 in)
- Lengths: 915-12190 mm (36-480 in)
- Belt speeds up to 91 m/min (300 ft/min)
- USDA smooth top positive drive belt (Available in blue or white)
- TIG-welded stainless steel frame
- FDA-approved belting and plastic components



AquaPruf Ultimate Specs

All conveyor models, with the exception of Belted Center drive, are available as an AquaPruf Ultimate 3A Certified system:

- Highest level of sanitation
- USDA and FDA approved belting and plastic components
- USDA red meat, poultry and dairy applications
- #4 polish on all internal surfaces

AquaPruf VBT Specs

- Lengths (infeed and exit): 508-1828 mm (20-72 in.)
- Heights: 406-6069 mm (16-240 in.)
- Widths: 305-610 mm (12 to 24 in.)
- Speeds: up to 30 m/min (100ft./min)
- Open frame and tool-less design for ease of cleaning



MADE FOR MAXIMUM HYGIENE

One compelling reason these models are ideal for raw and ready-to-eat foods is that AquaPruf conveyors were designed for easy access and tool-less disassembly. This fast belt removal means quicker cleaning, inside and out, and its durability means it can handle high-pressure sanitation requirements. The patent pending idler tail cleaning system, and drive sprocket wash-out design ensure every part of the conveyor can be properly cleaned quickly and easily.

Additional Benefits of AquaPruf Conveyors

Customizable Solutions

- With our engineered solutions, we can customize the series and models described here to meet your operation's individual needs.

Industry-Approved

- FDA- and USDA-approved components
- 3-A Certified
- Meets NSF and AMI design specifications

Get Started Sooner

- Designed for quicker cleaning and preparation time



MAKING YOUR DECISION

You need an effective sanitary conveyor solution, one that's fast and easy to clean in order to assure you're maximizing uptime. Our AquaGard and AquaPruf lines meet the demands of industry standards and fit into your efficient internal workflows. Choosing the right series, the right model, and the right configurations depends heavily on your industry and applications. Here's two brief reminders to help you compare:

Quick Look: Features

	AquaGard LP	AquaGard GT	AquaGard 7350	AquaPruf	AquaPruf Ultimate
Bolted Frame	✓	✓	✓		
Tig Welded Frame				✓	✓
#4 Interior Finish				Optional	✓
Curves & Inclines		✓	✓	✓	✓
Belt Lifters				Optional	✓
Frame Cut-Outs				Optional	✓
Bolted Stand-Offs	✓	✓	✓	Optional	
Welded Stand-Offs				✓	✓
Tool-Less Disassembly				✓	✓
Loads Up to 50 lbs	✓	✓			
Loads 51 to 500 lbs		✓		✓	✓
Loads Up to 750 lbs			✓	✓	✓
BISCC Approved	✓	✓	✓		
NSF & AMI Certified				✓	✓
USDA Red Meat & Poultry Certified					✓
3-A Dairy Certified					✓



Quick Look: Industry Comparison

AquaGard	AquaPruf
Baking	Raw meat and poultry
Confectionery	Dairy and cheese
Snack foods	Fruits and vegetables
Packaged goods	Ready-to-eat foods
Secondary packaging	Processed foods
Dry pet food	Wet pet food

Quick Look: Cleaning Solutions

AquaGard is ideal for...	AquaPruf is most suited for...
Wipe-down cleaning	High-pressure wash-down cleaning
Soap and water	Chemical cleaners

Know which conveyor is the best fit for your operation?

Contact us to learn more about the sanitary conveyor line that's right for you.

(800) 397-8664 | www.dornerconveyors.com

The Dorner Difference

Whatever conveyor system you choose, you will also receive:

- A 10-year warranty
- Reliable customer service
- Quick and easy installation
- Spare parts & aftermarket support