

MARUWA MCN.co.



WALKING FLOOR[®]



KEITH
MANUFACTURING CO



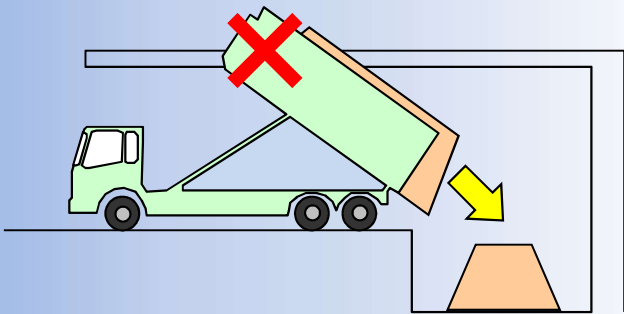
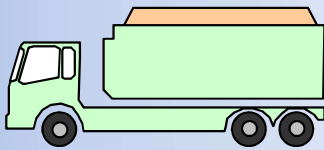
MOBILE WALKING FLOOR®

Specially designed trailers, the *WALKING FLOOR*® system is used worldwide to unload bulk material. Systems unload in minutes and can handle bulk goods, pallets, drums, bales and rolls.

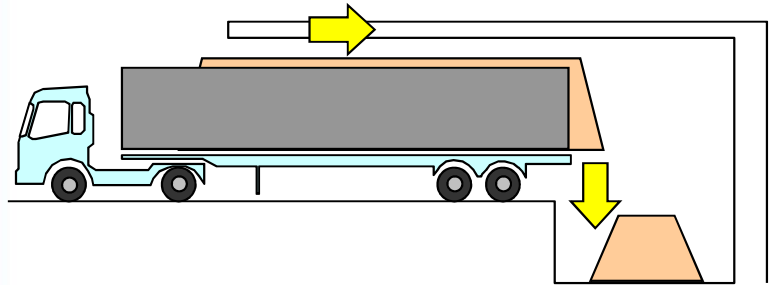
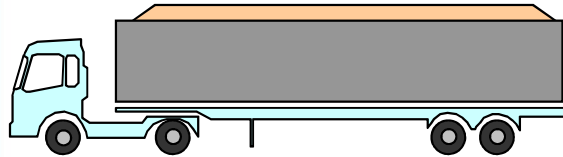


Unlike dump or tipper trailers, which require vertical space to unload, trailers outfitted with a *WALKING FLOOR*® unloader are not limited by height restrictions beyond the height of the trailer.

OTHER SYSTEMS



WALKING FLOOR®



To meet the different needs of haulers, we have developed a variety of flooring options to accommodate virtually any material. Floor slats are available in light, medium and heavy duty applications.



STATIONALY *WALKING FLOOR*®

WALKING FLOOR® engineered solutions are suitable for storing, receiving and metering a variety of materials. Systems are custom engineered to your specifications with virtually unlimited dimensions and weight restrictions. Systems can be flush mounted, installed above ground, placed in a pit or secured to an existing pad. Available in a variety of configurations, *WALKING FLOOR*® systems can be constructed to include multiple bins, walls and roofing.

Advantages:

- Power requirements are low.
- Increased power at startup is not needed.
- Low in maintenance.
- Systems easily combine with existing equipment.
- When used properly, system is safer than other conveyors
- Systems can be driven on by truck or forklift.





V-FLOOR® Designed to Last

With the option of floor slats constructed of special Hi-Wear steel, the V-FLOOR® unloading system is specially designed to handle difficult loads. The unique sub-deck, bearing, and slat configuration absorbs load impact. The rugged V-FLOOR® slat is teamed with the V-Drive, an evolution of the reliable and proven RUNNING FLOOR II® drive technology. The double-rod arrangement of the V-Drive hydraulic system divides the unloading forces between both ends of the drive frame, distributing force and allowing for faster unloading times. When installed in a trailer, the V-FLOOR® unloader provides safe, efficient and versatile horizontal unloading. Like all *WALKING FLOOR*® systems, the V-FLOOR® unloader requires minimal maintenance and is easy to operate.

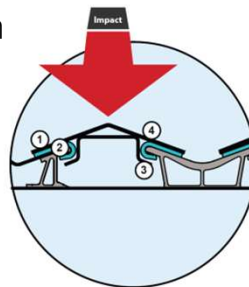


KEITH® V-FLOOR® 9-Slat System

PHOTO: with asphalt finisher

Impact Absorbing Design

1. Slat is available in steel or aluminum.
2. J-Bearing provides full-length bearing support.
3. Slat, bearing and sub-deck combination designed for maximum impact.
4. The V-FLOOR® takes advantage of a design incorporating a triangle shape and wings. This provides excellent rigidity and strength while maintaining the ability to absorb the energy of impact loads.



V-FLOOR® Key Benefits

- Unique slat design absorbs high impacts.
 - Sub-deck provides full length floor hold down.
 - No floor seal.
 - Superior leak resistance compared to standard flooring.
 - Ideal for a wide variety of backhauls.
 - Low maintenance and easy to operate, with low power requirements.
- V-9 only:
- Optional designs for high temp applications, such as asphalt delivery and soil remediation.
 - Steel option floor slat for highly abrasive loads.

Trough Design

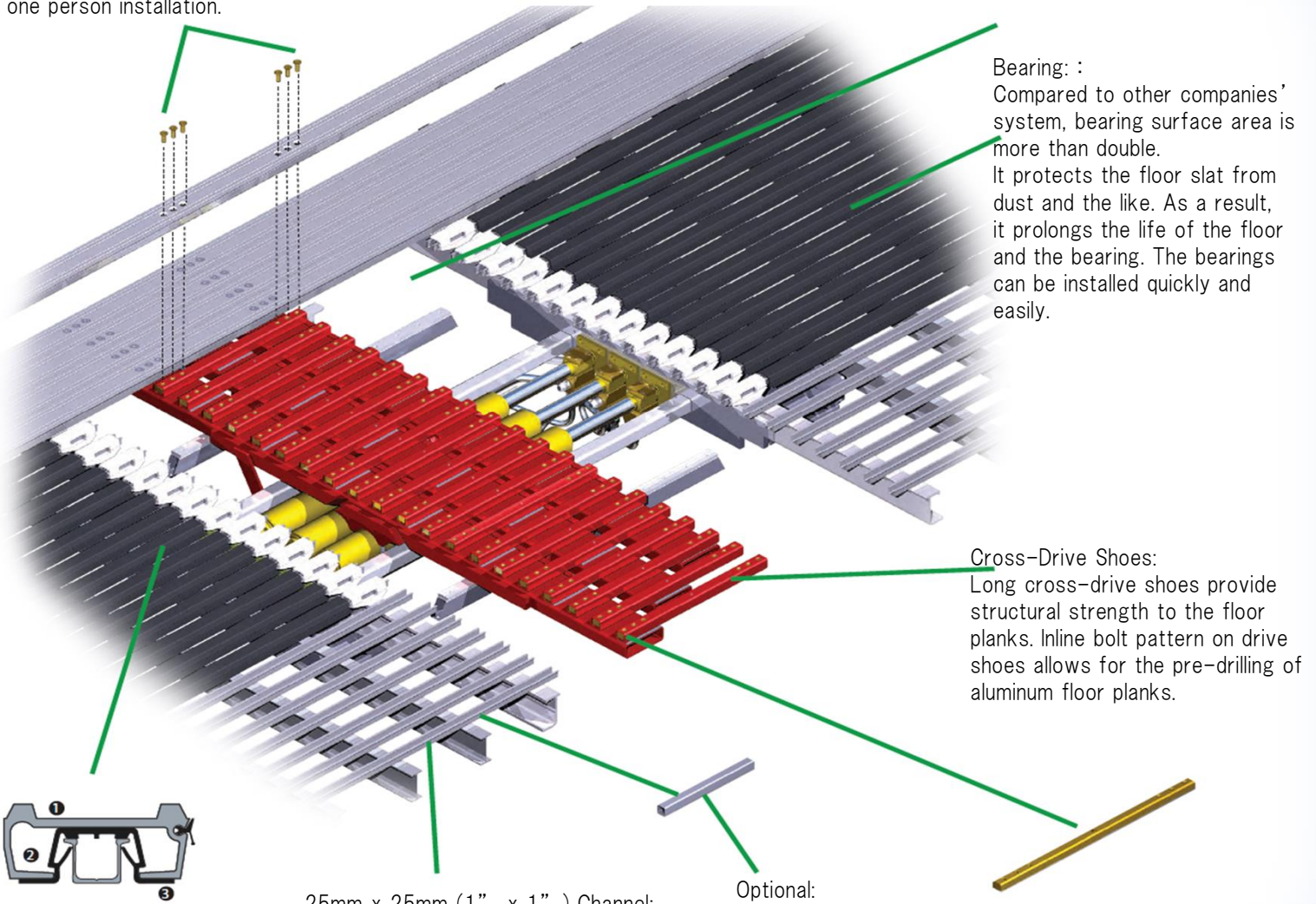
The unique design of the trough uses gravity to move fines and other material to the bottom of the trough.



SUPERIOR by DESIGN

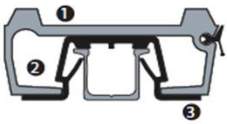
Floor planks are interchangeable and can be pre-drilled and pre-countersunk for quick one person installation.

Small Drive Window:
Drive unit allows for a small opening in the trailer structure resulting in a stronger trailer design.



Bearing:
Compared to other companies' system, bearing surface area is more than double. It protects the floor slat from dust and the like. As a result, it prolongs the life of the floor and the bearing. The bearings can be installed quickly and easily.

Cross-Drive Shoes:
Long cross-drive shoes provide structural strength to the floor planks. Inline bolt pattern on drive shoes allows for the pre-drilling of aluminum floor planks.



25mm x 25mm (1" x 1") Channel:

- Lighter without compromising strength
- Bolted or welded to cross members
- Splash bearings run full length
- Faster bearing installation

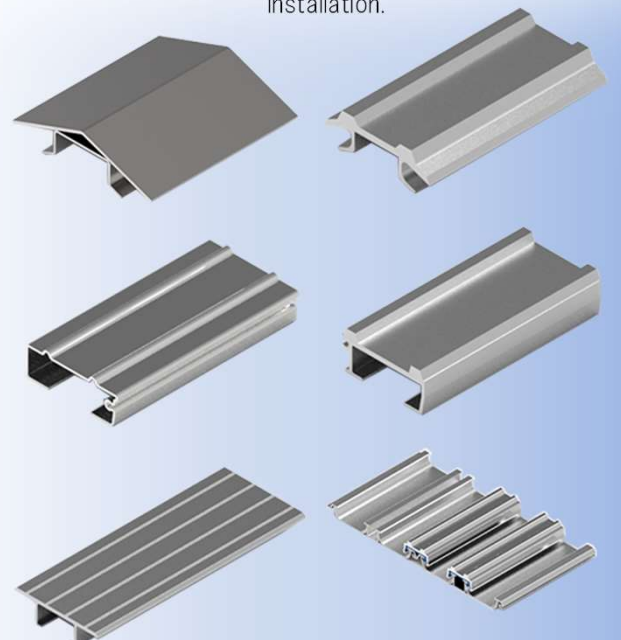
Optional:
25mm x 25mm (1" x 1") Tubing

Nut Bar:
Inline pattern allows floor planks to be installed completely from the top for fast one person installation.

Three Point Floor Plank Support System:

1. Large bearing surface
2. Heavy-duty legs and 25mm x 25mm tube or channel (1" x 1") support load
3. Bearing "wings" provide a solid foundation

Floor Plank Profiles
Floor planks are available in a large selection of profiles designed for light to medium to severe duty for bulk materials and pallet cargo. These include the STANDARD DUTY, IMPACT™ and V-FLOOR® Series. The V-FLOOR® planks feature planks without seals, with the bearing becoming the seal.



DRIVE UNIT

KRF II[®]-DXE Drive

KEITH
MANUFACTURING CO

- Interchangeable components reduce parts inventory
- Drive shoe designed for pre-drilling of floor planks
- Hydraulic components easily accessible for maintenance
- Chromated finish protects components from corrosion
- Durable & reliable light weight construction

Cylinder Barrel:

The cylinder design increases the system's strength by using all the cylinders as structural members. The cylinder barrel and not the rod move the cross-drive and floor planks.

Cross-Drive:

Each cross-drive is supported by two full length UHMW bearings mounted on the trailer's main frame beams.

Cylinder Rod:

The cylinder rod is a structural member of the drive unit and is attached at both ends to the drive frame. The short rod length and the drive frame attachment reduce deflection from unloading forces. The rod is induction case hardened chrome plated for excellent wear.

Ball Valve:

Standard manual on/off can be easily upgraded to optional electric valve for remote control (wireless or by cable.)

Steel Hydraulic Tubing:

New standardized design makes replacement easier. A zinc coating, plus chromation protect against Corrosion or tubing of Stainless steel.

Cylinder Head:

The design includes two wear rings to protect the seal and buffer seal from damage. Industrial wipers clean the rods and reduce entry of contaminants.

Drive Frame:

Frame structure designed for high speed/heavy duty unloading.

Check Valve:

JIC fittings make emergency repairs easy. Made of chromated corrosion resistant aluminum alloy for longer life.

Control Valve:

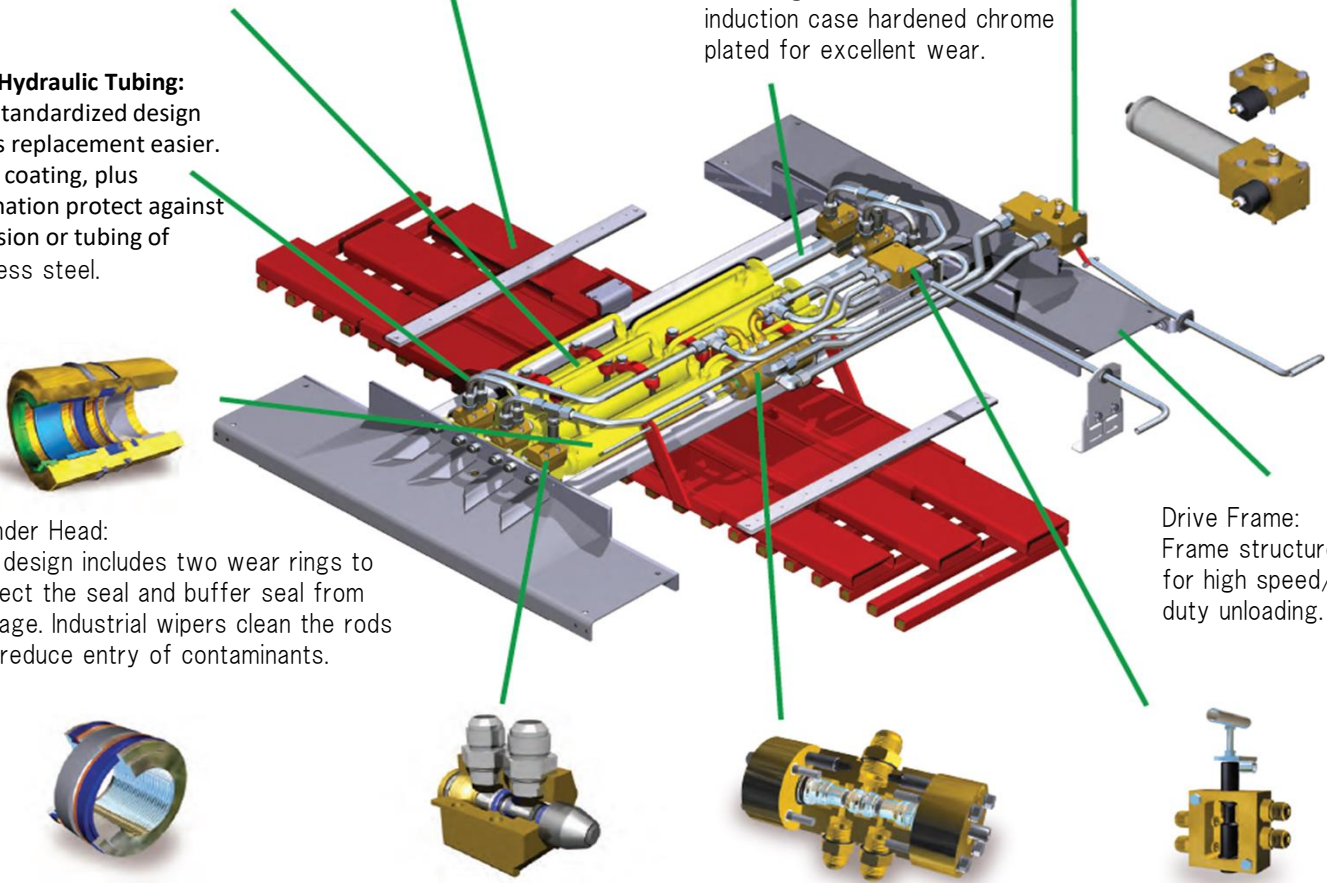
Determines load or unload mode. Electric option available.

Cylinder Piston:

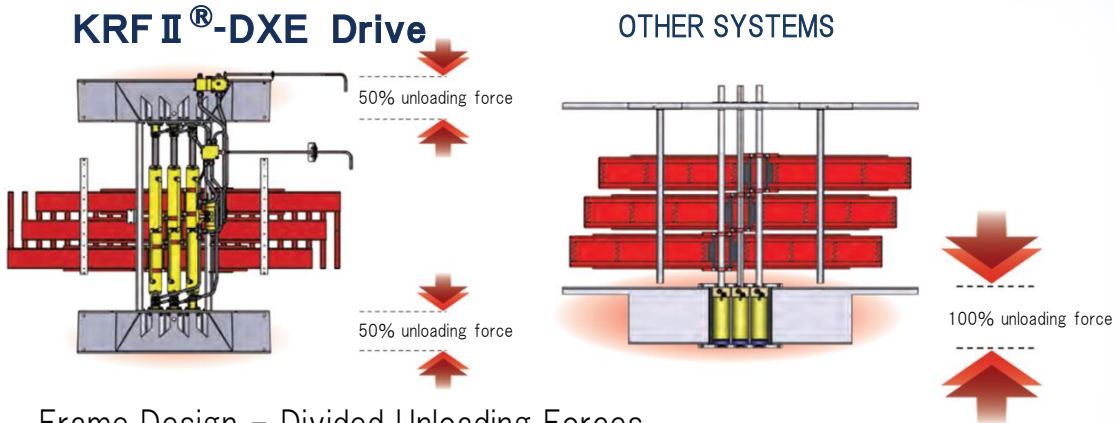
High temperature cup seals and heavy-duty wear rings protect the cylinder barrel from damage (scoring).

Switching Valve:

Trouble-free poppet valve design.



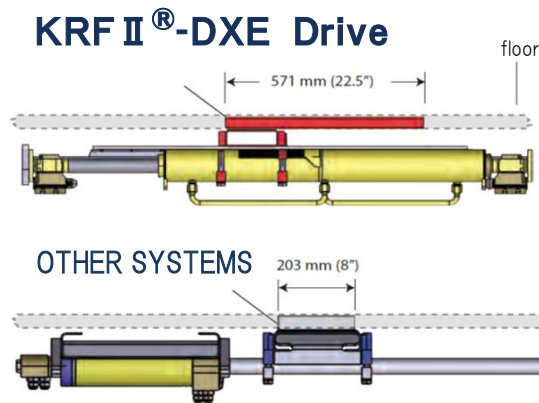
Divided Forces



Frame Design – Divided Unloading Forces

- 50% of forces on each end of drive frame
- Results in less frame stress
- Longer frame life
- Equal forces in both directions for loading or unloading

Floor Support (Drive Area)

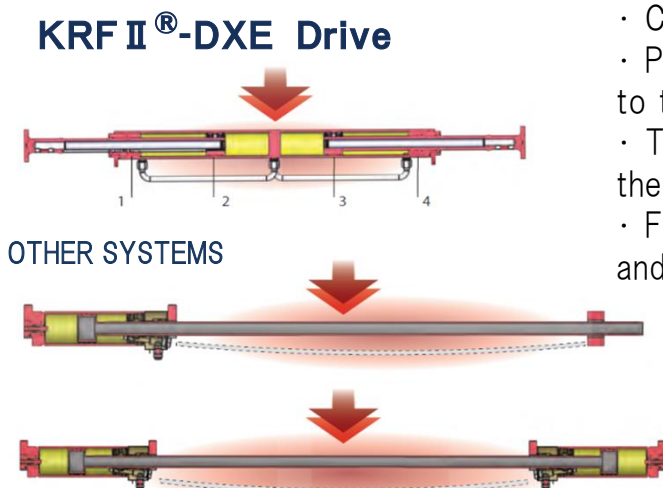


Long Drive Shoe Design – Structural Strength

- Excellent floor plank support
- Adds structural strength
- Better distribution of unloading forces to floor planks
- Supports load in drive area
- Standard design feature on all KRF II® – DXE drive units

Deflection

Cylinder Design – Deflection

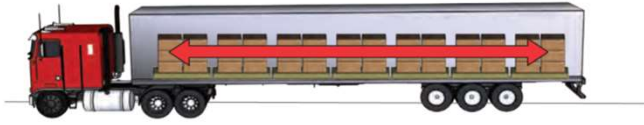


- Cylinder is a structural component of the drive frame
- Piston rods do not move and are attached at both ends to the drive frame
- The cylinder barrel acts to reduce the deflection from the unloading forces
- Four points (1,2,3,4) support between cylinder heads and piston reduces deflection

MOBILE WALKING FLOOR®

High Speed / Heavy Duty Unloading

TRAILER WITH KRF II®-DXE system



- Maximum pump flow of 227 liters (60 g) per minute
- Maximum speed: 3-4 minute loading or unloading for 13.6 m trailer
- Advised pump flow of 170 liters (45 g) per minute
- Advised speed: 5-6 minute loading or unloading for 13.6 m trailer

High Speed Unloading

- High speed unloading system since 1985
- Divided forces allow for faster unloading speeds
- Fastest unloading speed of any moving floor system
- Equal forces in both loading and unloading directions
- Frame structure designed for high speed unloading

Lowest Total Cost of Ownership

WALKING FLOOR® SYSTEM



OTHER SYSTEMS



The total cost of ownership of a *WALKING FLOOR*® system is the lowest in the industry over the lifetime of the equipment, because our systems include:

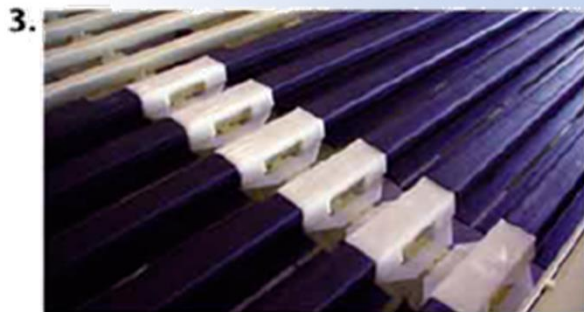
- durability
- reliability
- service
- Lower maintenance costs
- Less downtime
- Fewer repairs

WALKING FLOOR® Operation



There are 3 pairs of floorboards, and each one of them moves three times separately when moving backward (the load above does not move)
At the time of forward movement all the floor boards move simultaneously (the load at the top moves)

WALKING FLOOR® System Installation



1. Cross-members provide the foundation for the *WALKING FLOOR*® system.
2. The sub-deck consists of 1" or 25 mm square tubing or aluminum channel, and is welded or bolted to the cross-members.
3. On mobile applications, the Splash Guard Bearing increases the life of the flooring by protecting the underside from road grime.
4. The Winged Bearing evenly supports the flooring. Hold-Down Bearings are mounted at the discharge end of the system.
5. The bearings are snapped down onto the sub-deck. Configuration of the bearings will vary.
6. Slats are then attached to the cross-drives.

MARUWA ORIGINAL MOBILE TYPE *WALKING FLOOR*® OPTIONS

REINFORCED WALL ※PATENT PENDING

The reinforcing wall of container inside wall is divided into upper and lower structures. And by adding a bolt fixing part, it becomes possible to suppress the deformation at the time of loading.

※Please never hold down the load from above with a wheel loader etc. It may cause a malfunction.



PREVENT OPENING NEW STRUCTURE ※PATENT PENDING

For prevent opening, combined foldable type and wire type

When not loading, use a foldable type.



When loading, use a wire type.
This wire automatically disengages when the *WALKING FLOOR*® discharges the load.

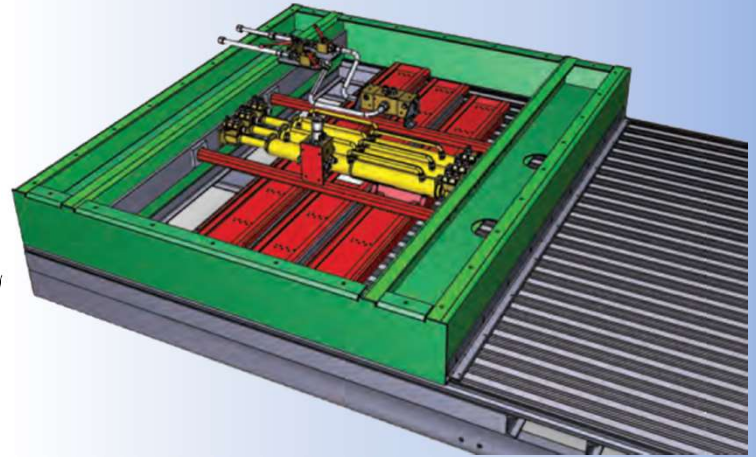


VARIOUS TYPE *WALKING FLOOR*®

TOP MOUNT DRIVE

By setting the drive unit on the floor, the stand is unnecessary and it will be possible to place the drive unit directly on the floor. You can also reduce the depth of the pit.

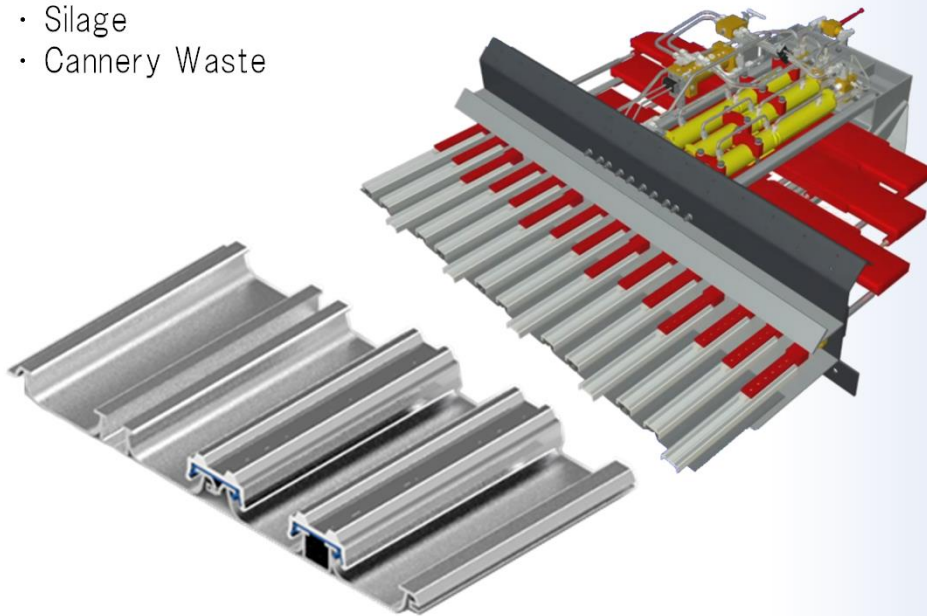
The drive and the conveying section are completely separate rooms.



LEAK PLOOF

Ideal for high-moisture loads

- Municipal Solid Waste
- Medical Waste
- Silage
- Cannery Waste



ICE BIN SYSTEM

We are dedicated to designing, engineering, manufacturing and assembling *WALKING FLOOR*® Ice Storage & Conveying Systems to the highest standards. To ensure quality control, we manage each step of the process.

- Standard & Custom Bin Conjurations Available
- Each System is Assembled In-House Prior To Shipping
- Hydraulic Components Assembled & Tested During Manufacturing
- Specialty UHMW Coating For Floor Slats is Applied In-House
- Technicians Available for Installation Supervision, Start-Up,



Built on Innovation

WALKING FLOOR® systems provide horizontal loading/unloading solutions for bulk materials, pallets, bales and rolls. Our moving floor conveying systems offer safe, versatile and efficient material handling for mobile unloaders and storage & conveying bins.

Variety of Materials

Our conveyors are used to move a variety of materials in numerous industries, including waste management & recycling, agriculture, aggregates & asphalt, wood products and energy production.

Best Solution

Our system consists of a series of reciprocating slats, which serve as the flooring of the mobile unloader or bin. When activated, the WALKING FLOOR® conveyor “walks” the load in or out.



THE 27th NEW ENVIRONMENTAL EXPOSITION 2018



MARUWA MACHINERY

MARUWA MACHINERY CO.,LTD

KEITH® JAPAN AGENCY

264-1 Mizuhashiichidabukuro Toyama-city,
Toyama 939-3555, JAPAN

TEL /JAPAN (076) 478-5800

FAX /JAPAN (076) 478-3908

URL <http://www.maruwa-mcn.co.jp/>

E-Mail info@maruwa-mcn.co.jp

KEITH
MANUFACTURING CO
www.keithwalkingfloor.com

The WALKING FLOOR trademark can be used only when describing specific material handling systems designed and manufactured by KEITH Mfg. Co. It is not appropriate to use the WALKING FLOOR trademark to describe any other system. KEITH and WALKING FLOOR are the registered worldwide trademarks of KEITH Mfg. Co. As intellectual property, they are valuable assets to the corporation and its affiliate companies. Trademarks must be used properly. We request that these guidelines be followed for all uses of trademarks.