# Linear Components
# Product Management Update




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# OEM Success Story

Customer: Safety Speed Manufacturing

Project: Vertical Panel Saw

Application: Saw blade positioning on premium model.

Challenges: Extreme dust/debris, limited maintenance, vibration and smooth motion

End Customer: Home Depot stores and direct customers

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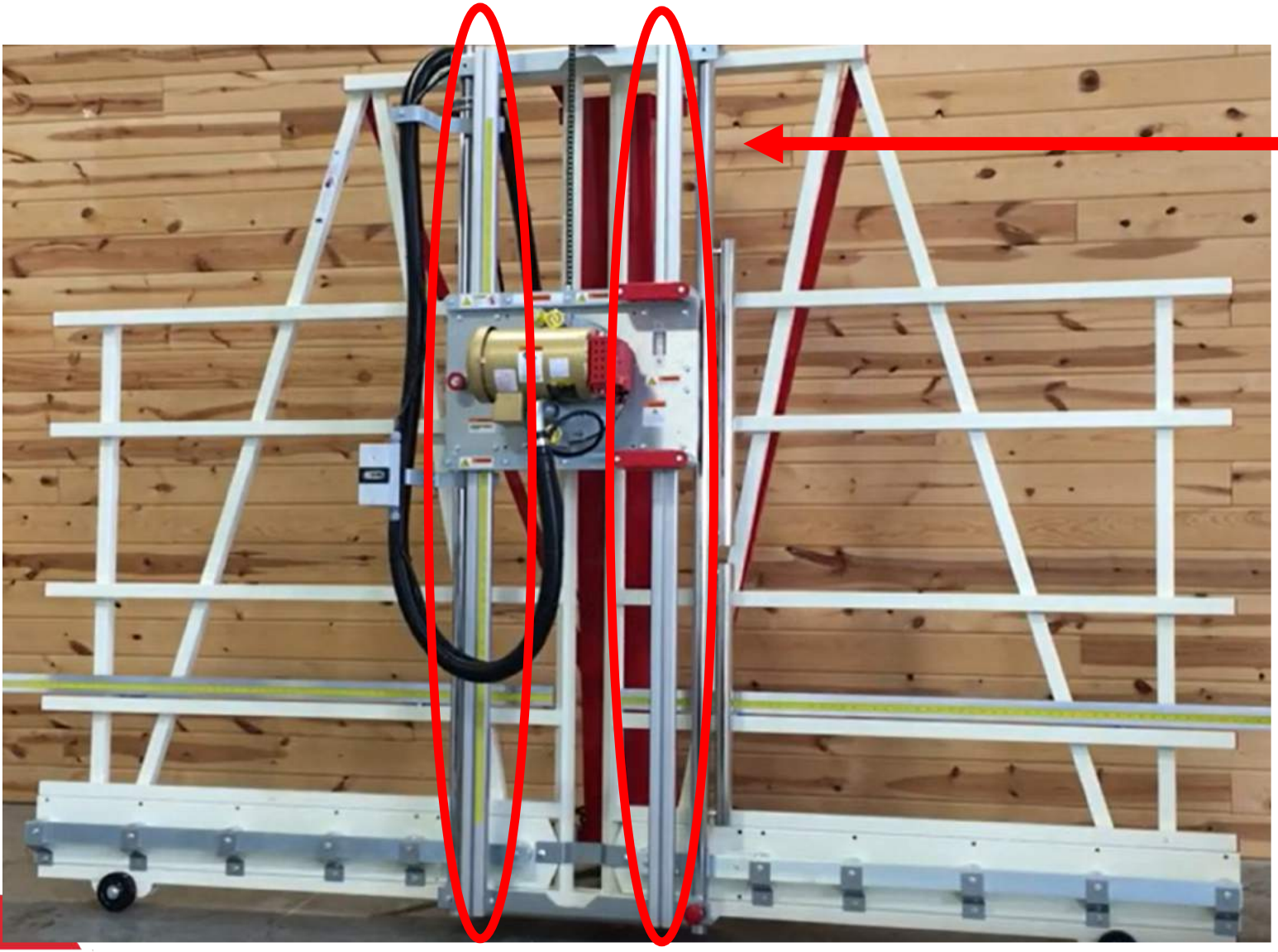
# Design



IVTAAG

# Redi-Rail Product Growth

- Launch completed successfully on 8/19
- Many interested customers, several prototype order have been placed

# Metric

# New Redi-Rail carriages are here!

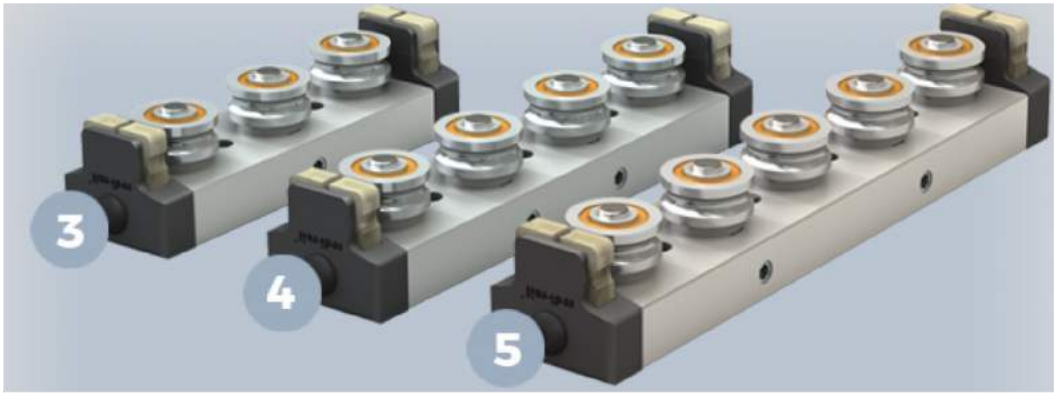
**What - All metric Redi-Rail sizes, 30, 45 & 65 now have a 4-wheel & 5-wheel option**

**Why-**

**1) More design flexibility**
**2) Higher load rating**
**3) Compete with BWC/Rollon more effectively**

**When-**

**These are available to order RIGHT NOW! Samples are going out to everyone on this call very soon**



# Inch

# New Redi-Rail products available now!

Inch Series with Lubrication

-All inch RR will be produced with mounting holes starting in Q4.
-Lubrication option is available at time of purchase and factory assembled to both ends

Complete part numbers:
RRS14PW & RRS18PW

# September 2019 AE Corner

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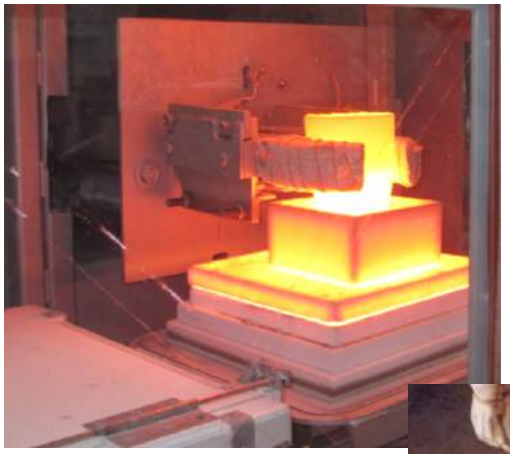
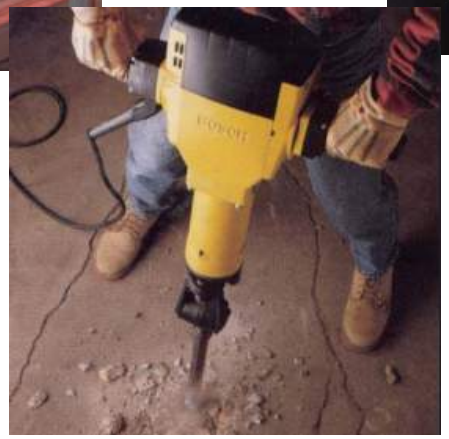
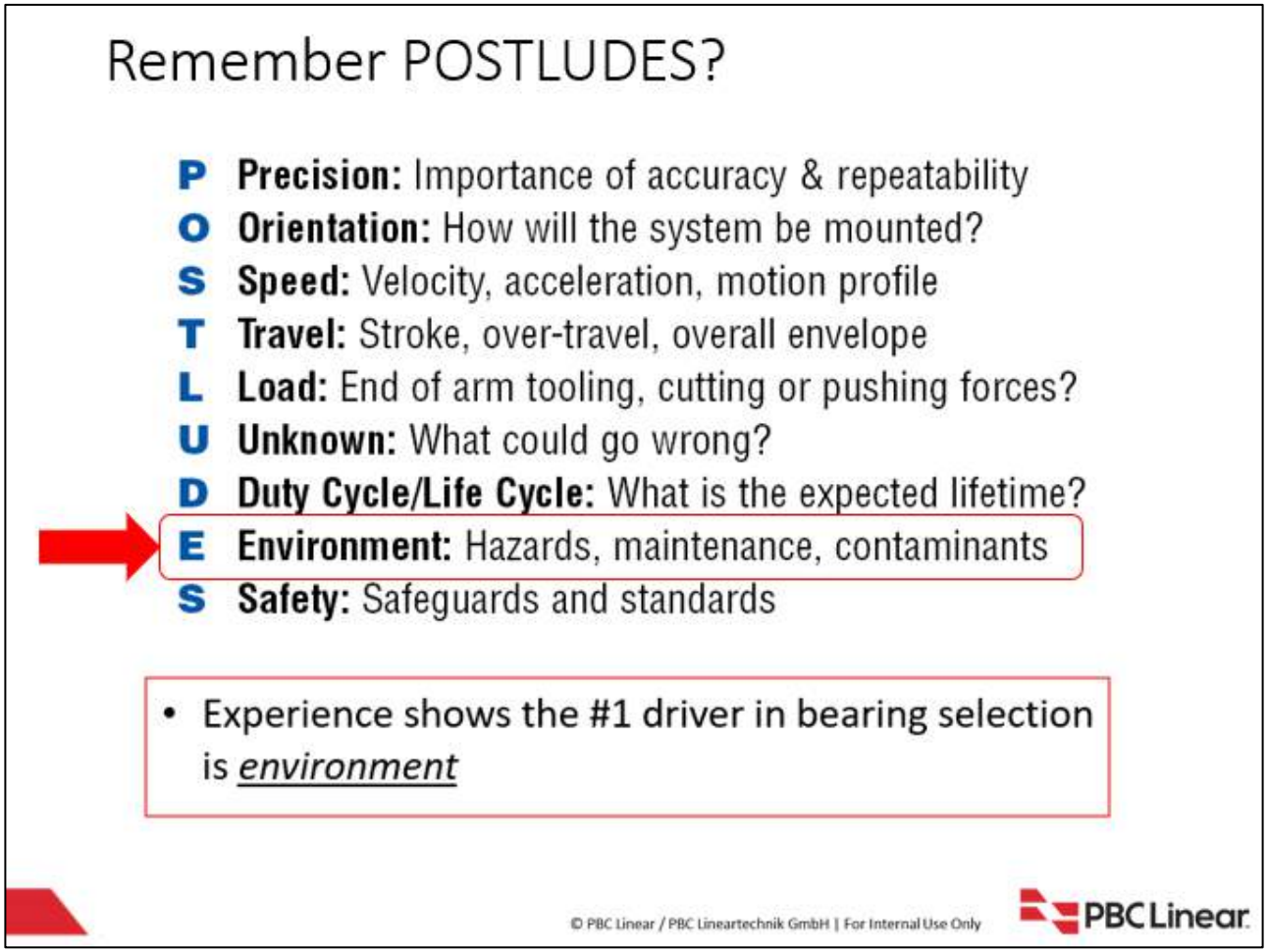
## Challenging Environments

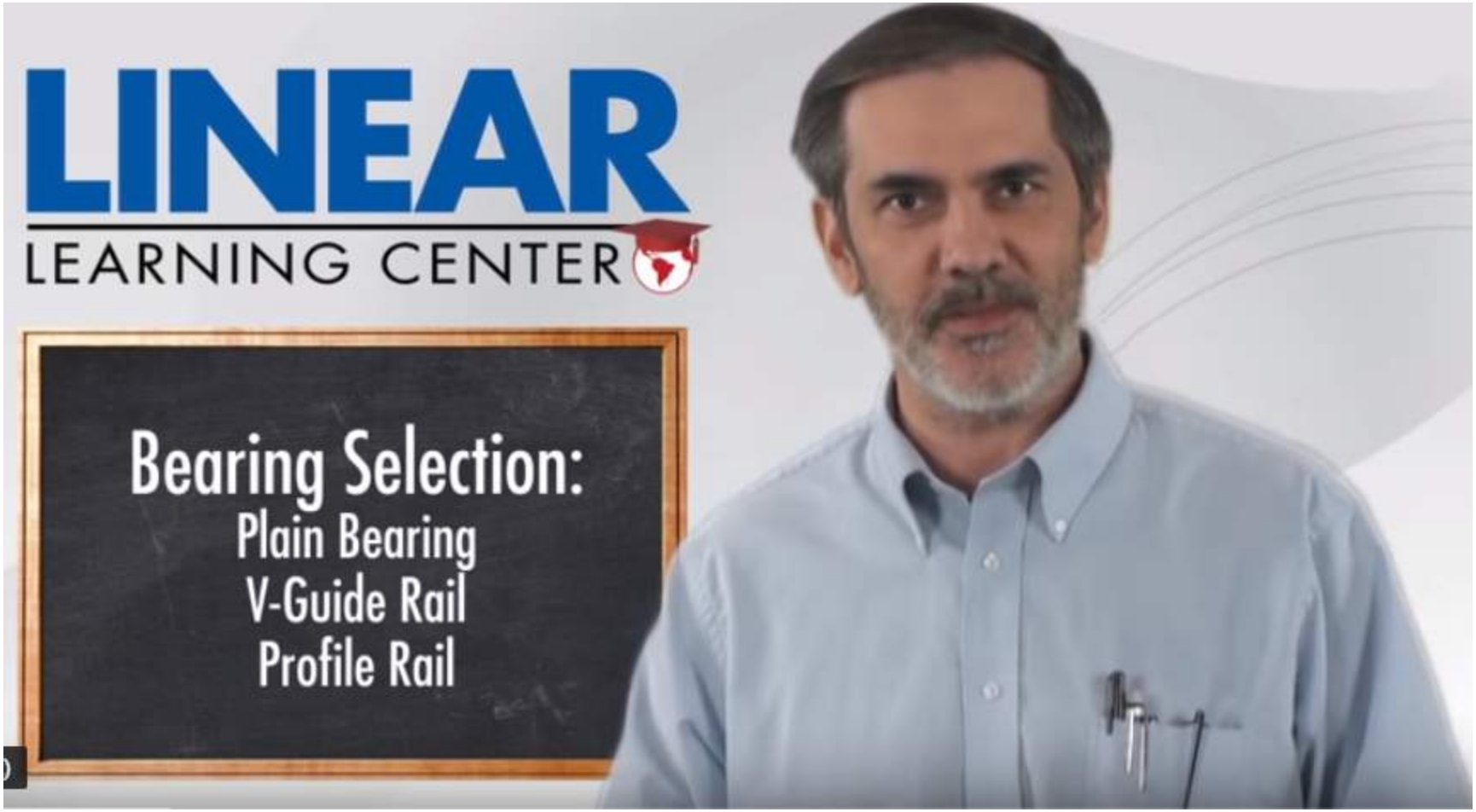


# March webex flashback: Optimizing Your Bearing Selection To Your Environment



# Key Sales Tool:  Bearing Selection Criteria Video




Video https://www.youtube.com/watch?v=xjFYKBuatU8

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# 5 Selection Criteria are examined in the video


Go to the 5:06 mark in the video for the beginning of the discussion on environment

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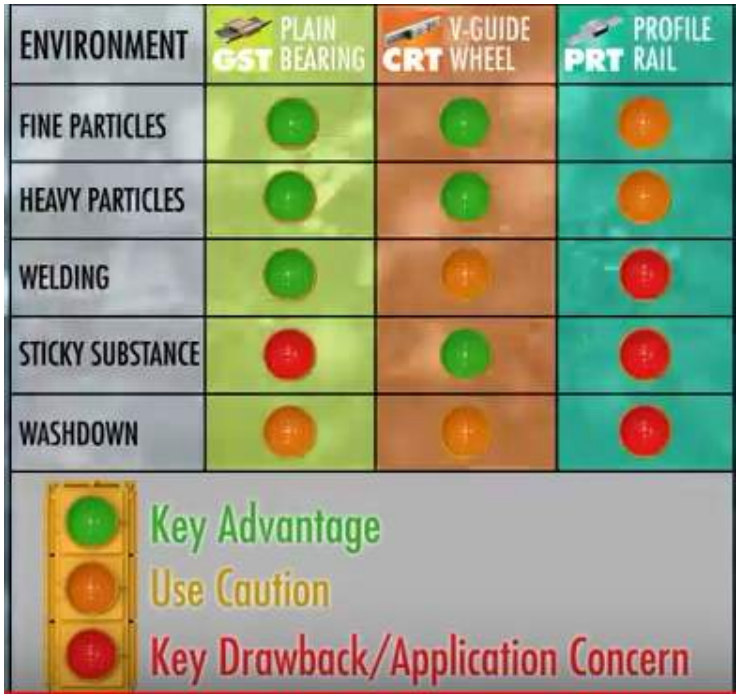
# Types of environment

- 5 Types of environments described in the video
  - 3 common bearing types are compared using stoplight chart




- We will start with 2 that are not listed above
  - Clean room
  - Vacuum

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# Spectrum of “Harshness”

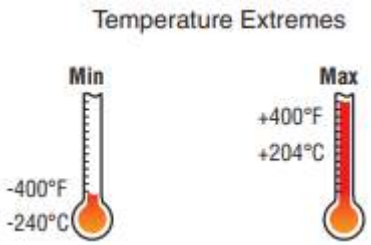
## Class 1 Clean Room — **High Contamination**

## “Cleanest” — **“Dirtiest”**

| | | |
|---|---|---|
| Very few particulates | Wash Down | Larger particulates |
| Positive Air Pressure | Dry Powder | Weld slag |
| Vacuum | Sawdust | Machine tools |

Other possibilities not addressed:

- Long travel
- Temperature extremes
- Short stroke/high cycle
- Shock/vibration

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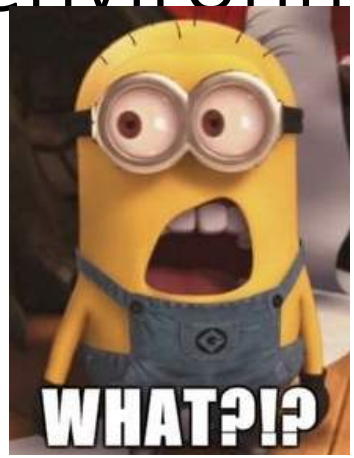
# A clean room is a harsh environment???




Mind Shift

Define the “clean” room:

- Very few particulates ?
- Positive Air Pressure ?
- High ACR (air exchange rate)?
- Full garments + respirator
- “Harsh” on account of the stringent requirements

- PBC products most often outside the clean room
- What else is in the clean room?
  - Igus Energy Chain cable carrier – generates a lot of particulate
  - GST and PBC lead screws generate less in comparison

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# A vacuum is a harsh environment?


Different from cleanroom:

- Presence & release of particles vs. gasses & vapors (outgassing)
- Stainless steel offers low outgassing, wide temperature range, and corrosion resistance
- Electroless nickel plating > anodizing for aluminum
  - Anodizing can cause the surface to retain water and cause outgassing
- Plain bearings made of PEEK, PPS, and PTFE offer relatively low outgas
- Vacuum-compatible grease

- PBC products most often outside the vacuum
  - Stainless steel V-guide with vacuum-compatible grease (high volume)

Reference: Linear Motion Tips, a Design World resource
https://www.linearmotiontips.com/how-to-specify-linear-motion-components-for-vacuum-applications/

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# Environmental Example:  Dry Powder


2:00 mark


2:41 mark


Video

https://www.youtube.com/watch?v=BNVPMBLSlA4&feature=youtu.be

# Environmental Example: Dry Powder

- Description
  - Fine, powdery particulate

- Typical Applications
  - Brick grinding
  - Paper cutting
  - Gun mount

Military


| Legend | |
|---|---|
| | Key Advantage |
| | Use Caution |
| | Key Drawback/Application Concern |

| | Plain, RST | Plain, GST | Ball, RST | Ball, PRT | V-Roller |
|---|---|---|---|---|---|
| Dry Powder | | | | | |
| Effect | Fine particulate does not affect | Inherent wiping action | Raceways clog, balls will not roll | Seals cannot completely prevent migration | V profile sloughs off contaminants |
| Ref | Brick Grinding | Contamination | | | Rollers |

# Environmental Example: Sticky Substance

- Description
  - Sticky substance gets on the rails

- Typical Applications
  - Beverage Dispenser
  - Sugar plant
  - Filling applications

| Legend | |
|---|---|
| 🟢 | Key Advantage |
| 🟡 | Use Caution |
| 🟠 | Key Drawback/Application Concern |

| | Plain, RST | Plain, GST | Ball, RST | Ball, PRT | V-Roller |
|---|---|---|---|---|---|
| Sticky Substance | 🔴 | 🔴 | 🔴 | 🔴 | 🟢 |
| Effect | Buildup eliminates clearance | Substance dries on | Balls roll thru and stick | Raceways collect material | V profile wiping action works well |
| Reference | | | | | |

# Environmental Example: Welding

- Description
  - Weld slag/spatter

- Typical Applications
  - Robotic welder
  - Weld stations
  - Adjustable fixtures
  - Plasma cutter

| Legend | |
|---|---|
| 🟢 | Key Advantage |
| 🟡 | Use Caution |
| 🔴 | Key Drawback/Application Concern |

| | Plain, RST | Plain, GST | Ball, RST | Ball, PRT | V-Roller |
|---|---|---|---|---|---|
| Weld Splatter | 🟢 | 🟢 | 🔴 | 🔴 | 🟡 |
| Affect | Inherent wiping action | No small raceways to plug | Spatter inhibits ball travel | Slag fills ball raceways | Self-cleaning action clears debris |
| Reference | Welding | App story | | | XYZ Gantry |

# Environmental Example: Wash down

- Description
  - Wipe down
  - Clean in place
  - Detergents
  - High pressure/temperature

Brochure

Video

- Typical Applications
  - Bottle filling
  - Ice cream packaging
  - Meat slicer

NOTES: White paper

- Aluminum is attacked by many corrosives
- 300 series stainless is the preferred material
- Designs need to minimize crevices and food/bacteria traps

| | Plain, RST | Plain, GST | Ball, RST | Ball, PRT | V-Roller |
|---|---|---|---|---|---|
| Caustic Wash down |  |  |  |  |  |
| Comment | Harshest environment requires stainless steel | Aluminum can be an issue | Seals are not perfect | Seals are not perfect, contaminants enter | Material and lubrication concerns |
| Ref | App. Story | See White paper link | | | See White paper link |

| Legend | |
|---|---|
|  | Key Advantage |
|  | Use Caution |
|  | Key Drawback/Application Concern |

# Environmental Example: Large Particulate

- Description
  - Large particulates such as wood or metal chips

- Typical Applications
  - Wood milling
  - Foundry
  - Metal chips

| Legend | |
|---|---|
| 🟢 | Key Advantage |
| 🟡 | Use Caution |
| 🟠 | Key Drawback/Application Concern |

| | Plain, RST | Plain, GST | Ball, RST | Ball, PRT | V-Roller |
|---|---|---|---|---|---|
| Large Particulate | 🟢 | 🟢 | 🟡 | 🟡 | 🟢 |
| Comment | Does not affect bearing surface | Close fit wipes away debris | Raceways fill, rolling is inhibited | Small raceways can't handle | V profile channels particles |
| Reference | App Story | App Story | | | |

# Summary - Takeaways

- Environment is a critical piece when getting POSTLUDES
  - The key takeaway is that the “E” in POSTLUDES is one of, if not *the* most important factor in selecting a bearing system
- PBC has a wide range of solutions for many environments
- PBC website offers many tools help guide customers
  - Catalogs
  - Videos
  - Application stories
  - White papers

| | Plain, RST | Plain, GST | Ball, RST | Ball, PRT | V-Roller |
|---|---|---|---|---|---|
| Sticky Substance | 🔴 | 🔴 | 🔴 | 🔴 | 🟢 |
| Welding | 🟢 | 🟢 | 🔴 | 🔴 | 🟡 |
| Dry Powder | 🟢 | 🟢 | 🟡 | 🟡 | 🟢 |
| Wash down | 🟢 | 🟡 | 🔴 | 🔴 | 🟡 |
| Large Particulate | 🟢 | 🟢 | 🔴 | 🔴 | 🟢 |
| Vacuum | 🟡 | 🟡 | 🟡 | 🟡 | 🟡 |
| Clean Room | 🟡 | 🟡 | 🟡 | 🟡 | 🟡 |

| Legend | |
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