



**September 2017**

# MAGNETIC SEPARATION AUDITS **of** MILLS

By Don Harris  
Sales Manager - Canada



**BUNTING** Magnetics Co.

**Why have a -**

# **MAGNETIC SEPARATION AUDIT ?**

**- Do they have a metal contamination problem?**

**(Are They Meeting Their Quality Standards for their Customers?)**

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**- They question whether their existing Magnets effective?**

**- Are the Magnets being cleaned & maintained?**

**- Do they have Safety Concerns?**

**- Where would they add additional Magnets?**



# “LEG RUSTY SCALE, GROUND METAL AND SEMOLINA”

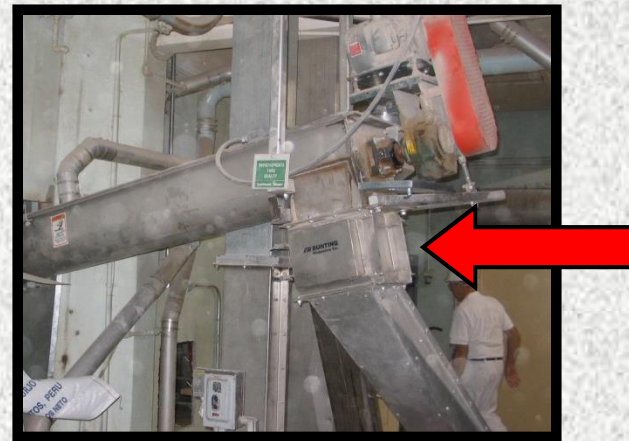




# 5 THINGS WE PROVIDE

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## 1. Photo Document Location of All Existing Magnets



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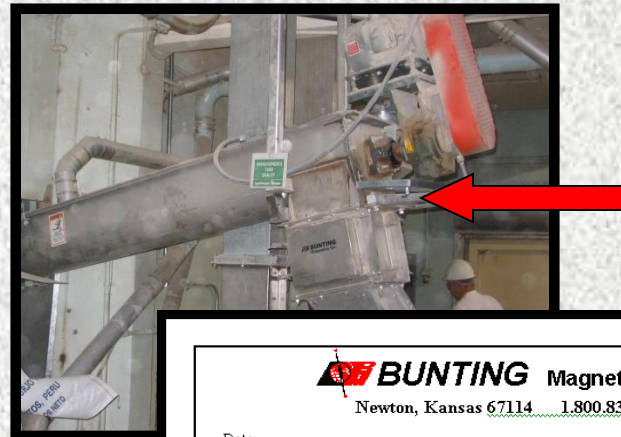
## 2. Do Pull Test on Each Existing Magnet & Evaluate it's Performance



Date: \_\_\_\_\_  
 Inspector's Name: \_\_\_\_\_  
 Company Name: \_\_\_\_\_  
 Plant Location: \_\_\_\_\_

		PLATE MAGNETS		1/8 x 1 x 3 PLATE	
		1/2 DIA BALL®		1 INCH GAP	
		SURFACE	AVERAGE		AVERAGE
TEST RECORD					
PLATE MAGNET 1	TEST 1				
Location:	TEST 2				
	TEST 3				
PLATE MAGNET 2	TEST 1				
Location:	TEST 2				
	TEST 3				
PLATE MAGNET 3	TEST 1				
Location:	TEST 2				
	TEST 3				
PLATE MAGNET 4	TEST 1				
Location:	TEST 2				
	TEST 3				
CARTRIDGES - GRATES OR TRAYS					
GRATE/DRAWER	TEST 1				
Location:	TEST 2				
	TEST 3				
GRATE/DRAWER	TEST 1				
Location:	TEST 2				
	TEST 3				
GRATE/DRAWER	TEST 1				
Location:	TEST 2				
	TEST 3				
GRATE/DRAWER	TEST 1				
Location:	TEST 2				
	TEST 3				
TEST APPARATUS:		TWO DECIMAL PLACE DIGITAL FORCE GAUGE, STANDARD BNC PULL TEST KIT			
TEST PROCEDURE:		1. PLACE MAGNET ON FLAT HORIZONTAL SURFACE, WITH MAGNETIC FACE FACING UPWARD. 2. CAPTURE TEST PIECE ON FORCE GAUGE. 3. ZERO FORCE GAUGE. 4. FIND ONE OF THE TWO POLE LINES RUNNING ACROSS THE FACE OF THE MAGNET, WHERE THE PULL VALUES ARE HIGHEST. 5. PLACE THE TEST PIECE ON ONE OF THE TWO POLES AND ENSURE THE FORCE GAUGE IS IN A VERTICAL POSITION. 6. SLOWLY PULL THE FORCE GAUGE DIRECTLY UPWARD UNTIL THE TEST PIECE BREAKS CONTACT WITH THE MAGNET FACE. 7. RECORD THE VALUE SHOWN ON THE FORCE GAUGE. 8. REPEAT THE TEST 5 TIMES, MOVING THE CONTACT POINT FOR EACH TEST.			

# 5 THINGS WE PROVIDE



1. Photo Document Location of All Existing Magnets

2. Do Pull Test on Each Existing Magnet & Evaluate it's Performance

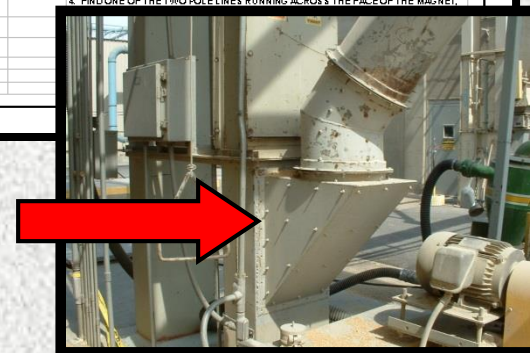
3. Recommend Additional Magnet or Metal Detection Placement if Needed

Date: \_\_\_\_\_  
Inspector's Name: \_\_\_\_\_  
Company Name: \_\_\_\_\_  
Plant Location: \_\_\_\_\_

TEST RECORD		PLATE MAGNETS		1/8 x 1 x 3 PLATE	
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		SURFACE	AVERAGE		
PLATE MAGNET 1	TEST 1				
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PLATE MAGNET 3	TEST 1				
Location:	TEST 2				
	TEST 3				
PLATE MAGNET 4	TEST 1				
Location:	TEST 2				
	TEST 3				

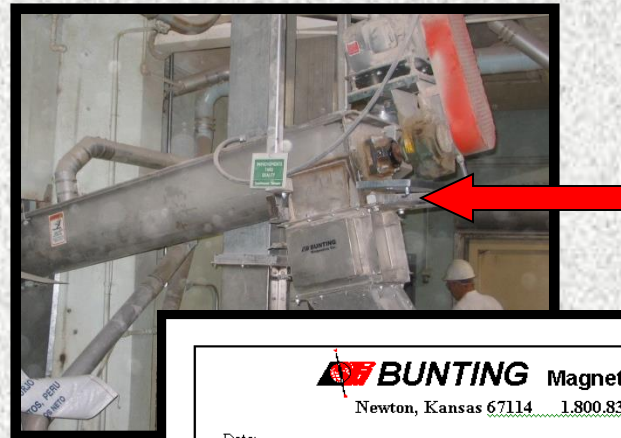
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		1/2 DIA BALL@		1 INCH GAP	AVERAGE
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1. PLACE MAGNET ON FLAT HORIZONTAL SURFACE WITH MAGNETIC FACE FACING UPWARD.  
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3. ZERO FORCE GAUGE  
4. FIND ONE OF THE TWO POLE LINES RUNNING ACROSS THE FACE OF THE MAGNET.





# 5 THINGS WE PROVIDE



1. Photo Document Location of All Existing Magnets

2. Do Pull Test on Each Existing Magnet & Evaluate it's Performance

3. Recommend Additional Magnet or Metal Detection Placement if Needed

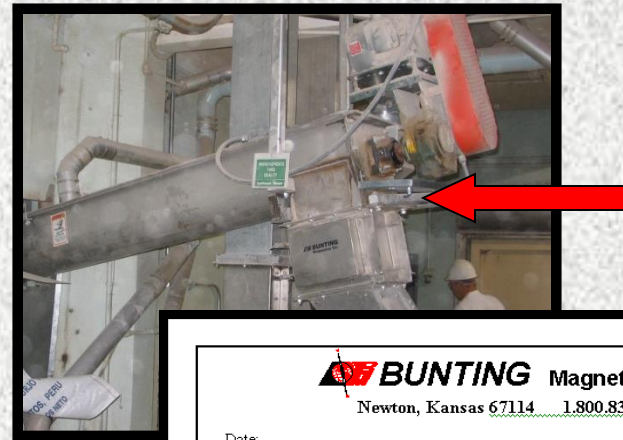
4. Observe & Discuss Existing Maintenance Procedures

Date: \_\_\_\_\_  
Inspector's Name: \_\_\_\_\_  
Company Name: \_\_\_\_\_  
Plant Location: \_\_\_\_\_

		PLATE MAGNETS			
		1/2 DIA BALL@		1/8 x 1x3 PLATE	
TEST RECORD		SURFACE	AVERAGE	1 INCH GAP	AVERAGE
PLATE MAGNET 1 Location:	TEST 1				
	TEST 2				
	TEST 3				
PLATE MAGNET 2 Location:	TEST 1				
	TEST 2				
	TEST 3				
PLATE MAGNET 3 Location:	TEST 1				
	TEST 2				
	TEST 3				
PLATE MAGNET 4 Location:	TEST 1				
	TEST 2				
	TEST 3				
		CARTRIDGES - GRATES OR TRAYS			
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	TEST 2				
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1. Photo Document Location of All Existing Magnets

2. Do Pull Test on Each Existing Magnet & Evaluate it's Performance

3. Recommend Additional Magnet or Metal Detection Placement if Needed

4. Observe & Discuss Existing Maintenance Procedures

5. Discuss Current Technology Upgrades that may Enhance Performance

Date: \_\_\_\_\_  
Inspector's Name: \_\_\_\_\_  
Company Name: \_\_\_\_\_  
Plant Location: \_\_\_\_\_

TEST RECORD		PLATE MAGNETS		1/8 x 1 x 3 PLATE	
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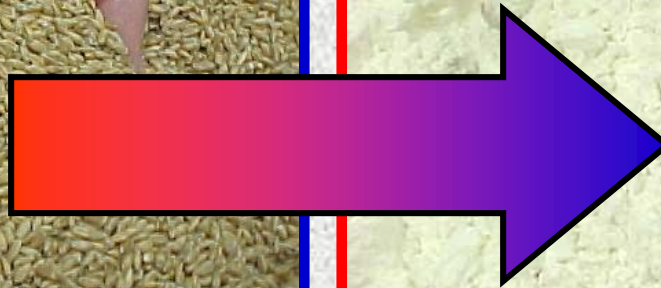
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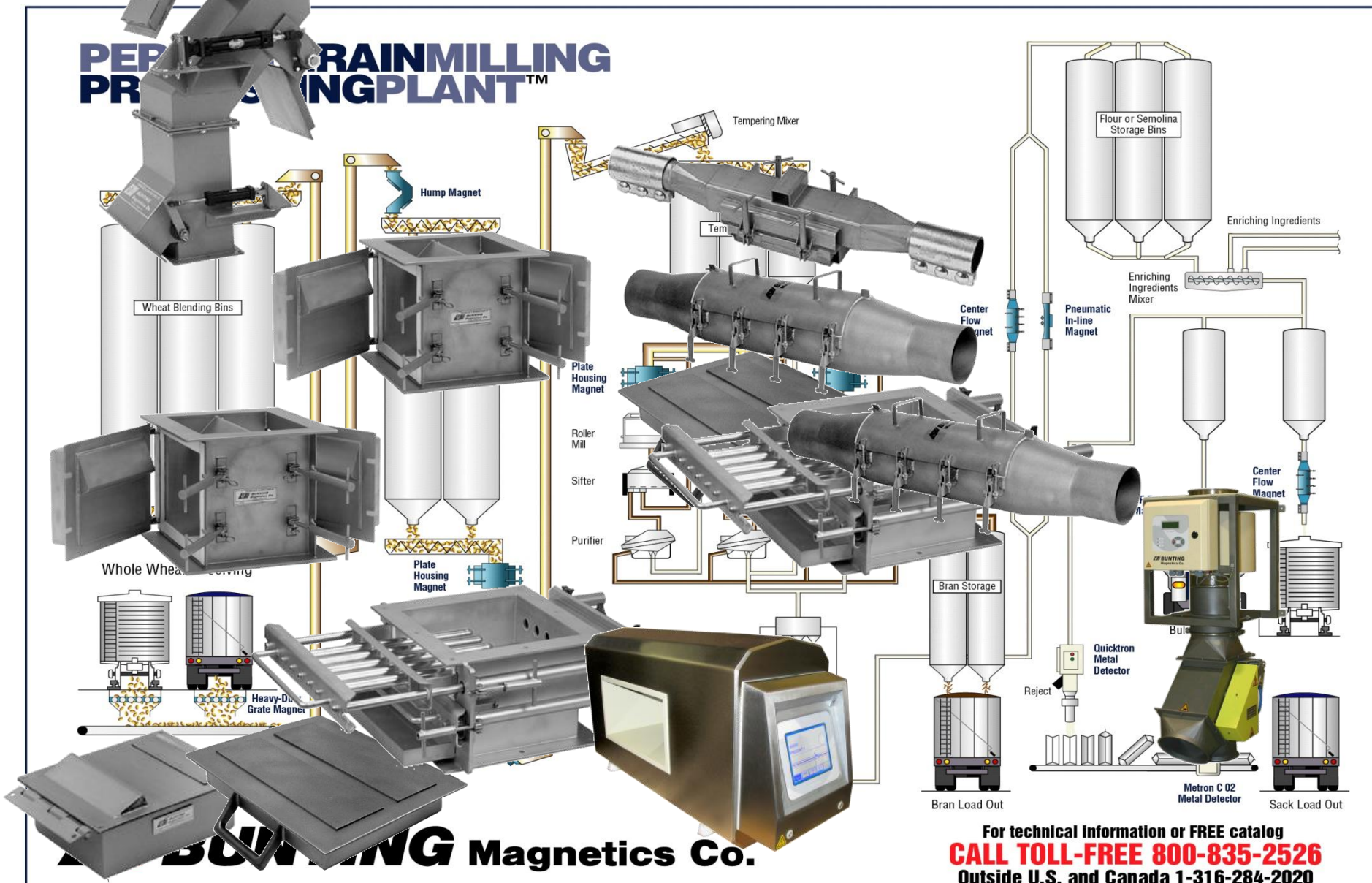


# Good **Magnetic Separation** & **Product Purity** is a **PROCESS !**





# A Magnetically Protected Flour Mill Grain Elevator vs. Flour Mill



For technical information or FREE catalog  
**CALL TOLL-FREE 800-835-2526**  
 Outside U.S. and Canada 1-316-284-2020

# FARM STORAGE



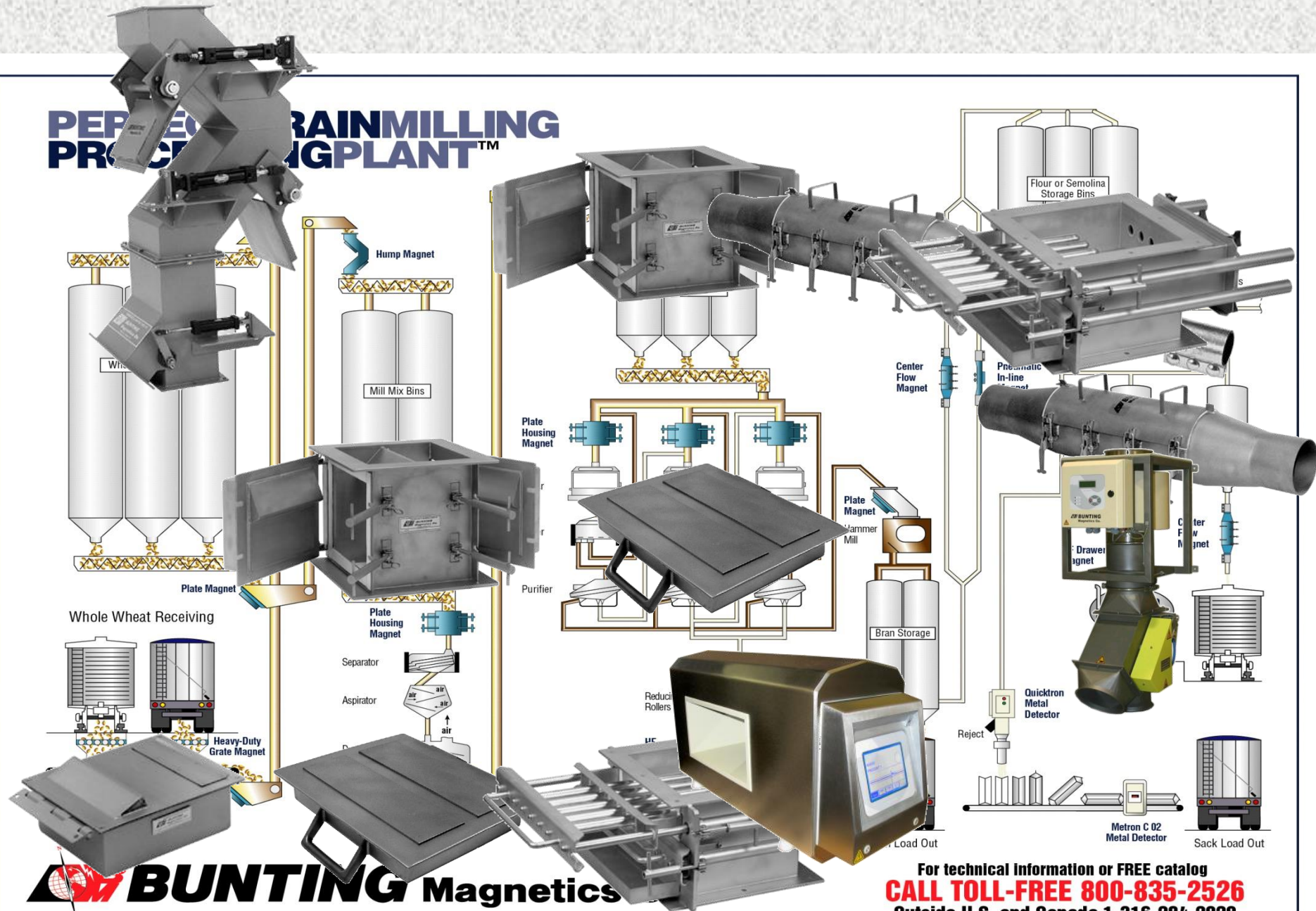


# LOOKING FOR OPPORTUNITIES TRUCK RECEIVING





# A Magnetically Protected Flour Mill



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## RAIL RECEIVING



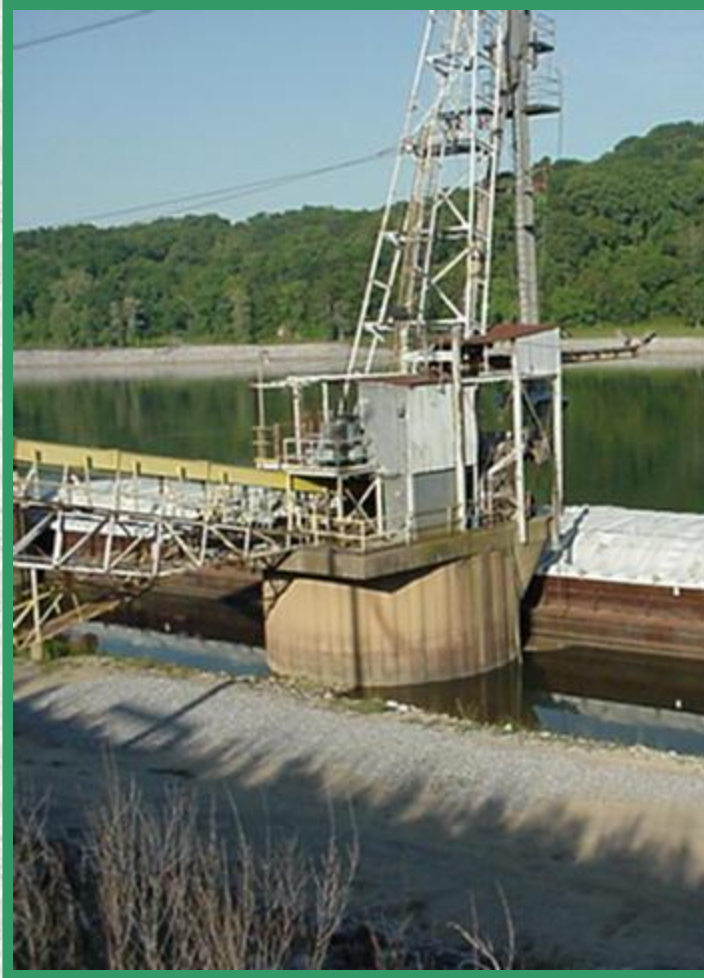


# BOTTOM TRUCK or RAIL RECEIVING HOPPERS





## BARGE RECEIVING





## BARGE RECEIVING

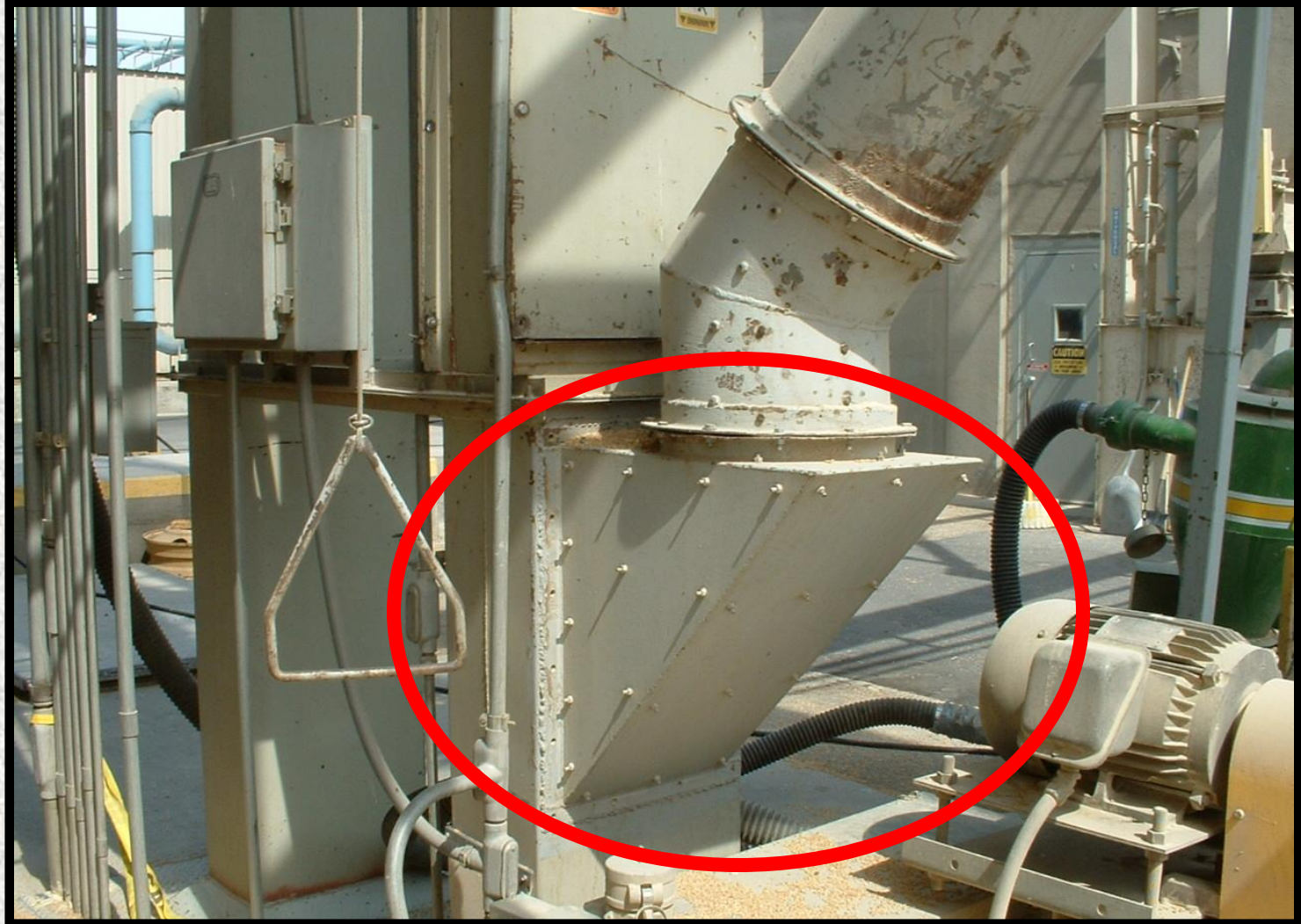




## - OPPORTUNITY -

**“OUTSIDE LEG FROM METAL STORAGE BINS”**

**“First Chance” - Infeed Magnetic Protection Before Leg**



**- OPPORTUNITY -**

**“INSIDE LEG FROM RAIL UNLOAD”**

**“First Chance” - Infeed Magnetic Protection Before Leg**





# PITS - TOUGH PLACES !



# **PITS - LEG HOPPERS - CLEANING**

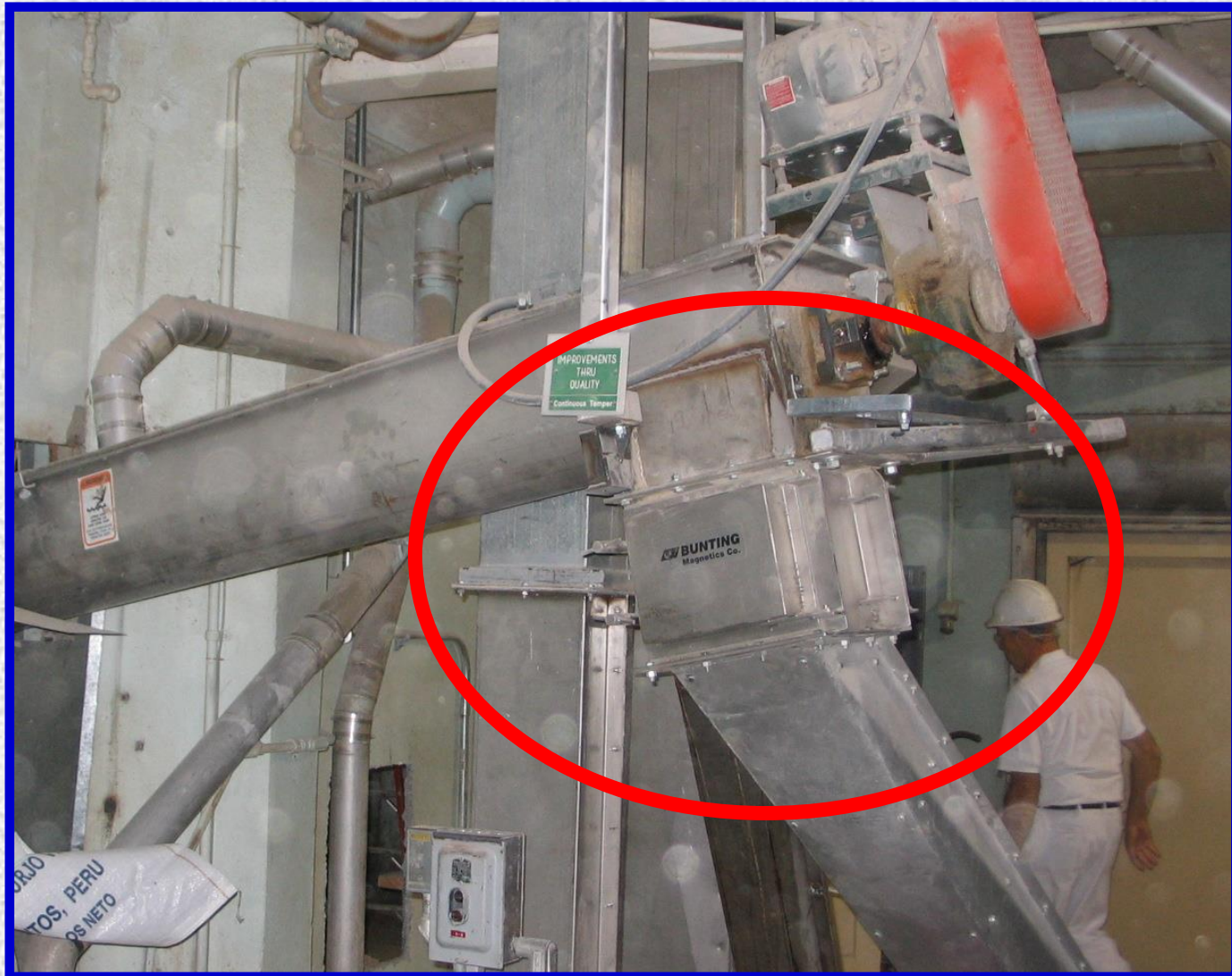
## **For Maintenance Improvements**





# WHOLE WHEAT SCREW CONVEYOR

## Plate Housing Magnets



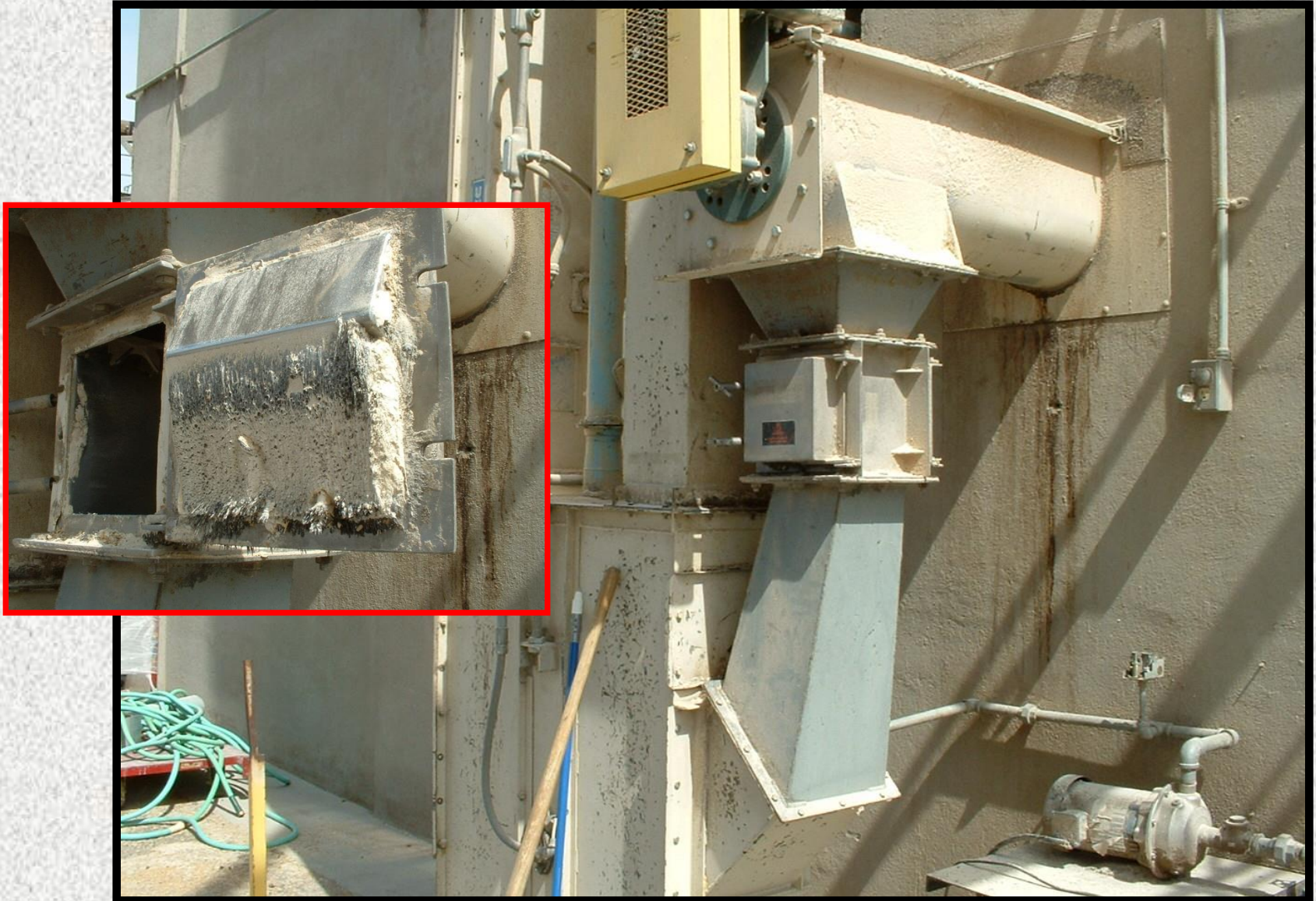


# **“OUTSIDE SCREW CONVEYOR”**

Pull Test lbs. : .4#

**Currently Ceramic Plate Housing Magnet**

**Recommend New Neo Plate Housing Magnet - 12# Pull**





## THIRD TEMPER SCOURER

# Plate Housing Magnet - Take Pull Test & Compare



## MILL FEED LINES

### Neo Plate Housing Magnets - Document & Test





## - OPPORTUNITY -

**“SCREW CONVEYOR FEEDING 1ST BREAK”**

**“First Chance” - Infeed Magnetic Protection before Rollers**



# PURITAN SC DRAWER MAGNET

## Whole Wheat Line?????





## WHOLE WHEAT WEAR





## LOAD OUT MAGNET LINE #2

### Neo Drawer Magnets - Document & Test



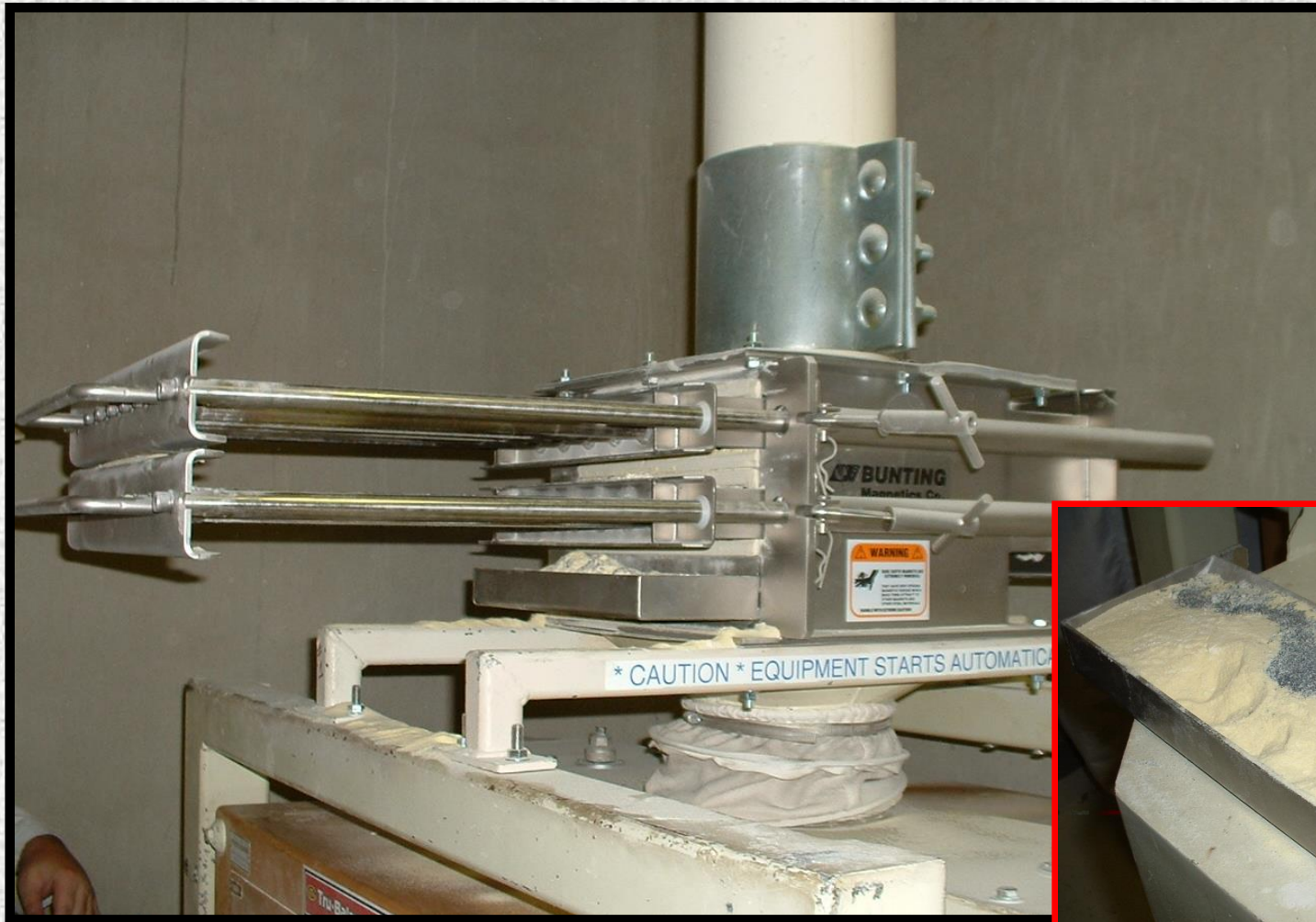
Good Job of Separation





## LOAD OUT LINE #2

# Upgrade Magnetic Cartridges in Drawer - Test



# BRAN PROCESSING - HAMMERMILL

## Half Hump Magnet - Document





# BRAN PROCESSING - HAMMER MILLS

## Plate Magnets - Document





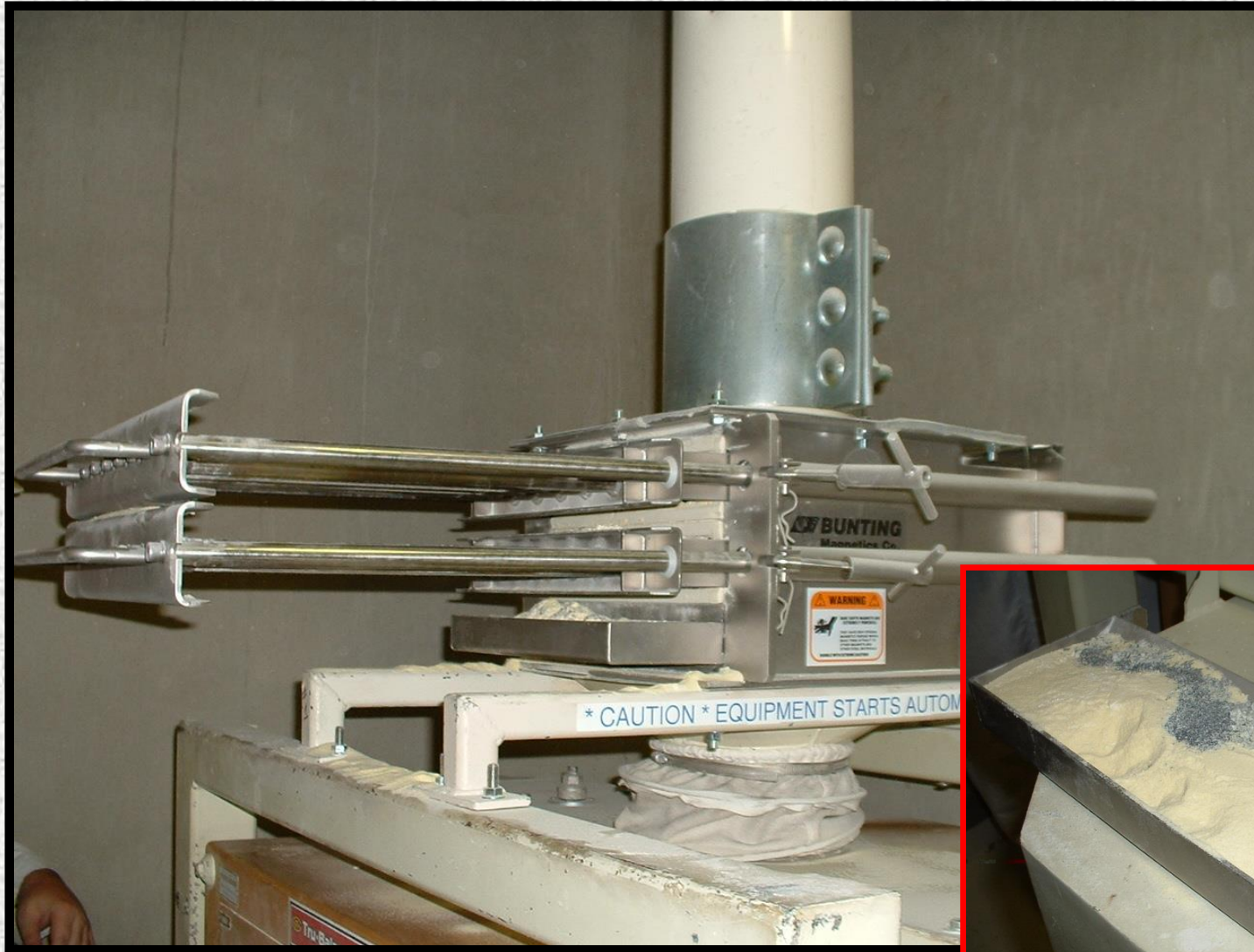
Pull Test lbs. : 5.7, 6.0, 6.1 UPPER

6.1, 6.5, 6.3 LOWER

## **“LOAD OUT MAGNET LINE #1”**

**Currently HFS 2012 NPB Drawer Magnet**

**Recommend New Neo NHI Replacement Cartridges - 14# Pull**





Pull Test lbs. : 6.3, 6.2, 6.0 UPPER

6.7, 6.5, 6.2 LOWER

## **“LOAD OUT MAGNET LINE #2”**

**Currently HFS 2012 NPB Drawer Magnet**

**Recommend New Neo NHI Replacement Cartridges - 14# Pull**





# **“SEMOLINA MAGNET”**

Pull Test lbs. : 14.4, 14.6, 14.4 UPPER

Currently HFS 2010 NHI Drawer Magnet

14.0, 14.0, 13.6 LOWER

**Very Good Magnet - Critical Area & Recommend  
Second Identical Unit to Stack - Makes 4 Rows of Protection**





# PNEUMATIC FLOUR LOAD OUTS

## Dual Center Flow Magnets



# PNEUMATIC FLOUR LOAD OUTS

## Dual Center Flow Magnets





# PNEUMATIC FLOUR LOAD OUTS

## Dual Center Flow Magnets



# **PNEUMATIC FLOUR LOAD OUT**

## **Center Flow Magnets - Working Well**

**“LAST CHANCE MAGNET”**





# RAIL LOAD OUT of Clean Flour





## RAIL LOAD OUT





**- OPPORTUNITY -**  
**TANKER TRUCK LOAD OUT**  
**of Clean Flour**



# - OPPORTUNITY - BAGGING OPERATION

**Add Metal Detector either Before or After**





**- OPPORTUNITY -  
BAGGING OPERATION**

**Add Metal Detector either Before or After**



# - OPPORTUNITY - BAGGING OPERATION Add Metal Detector after Bagging



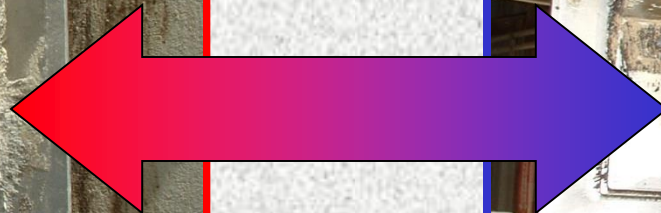


# MAINTENANCE PROCEDURES

## CLEANING MAGNETS

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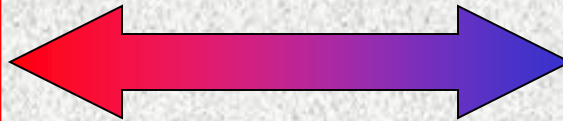
- Regular Cleaning Schedule
- Sign Off Cleaning Log - best for QC
- Spot Checks are good



# MAINTENANCE PROCEDURES for CLEANING MAGNETS

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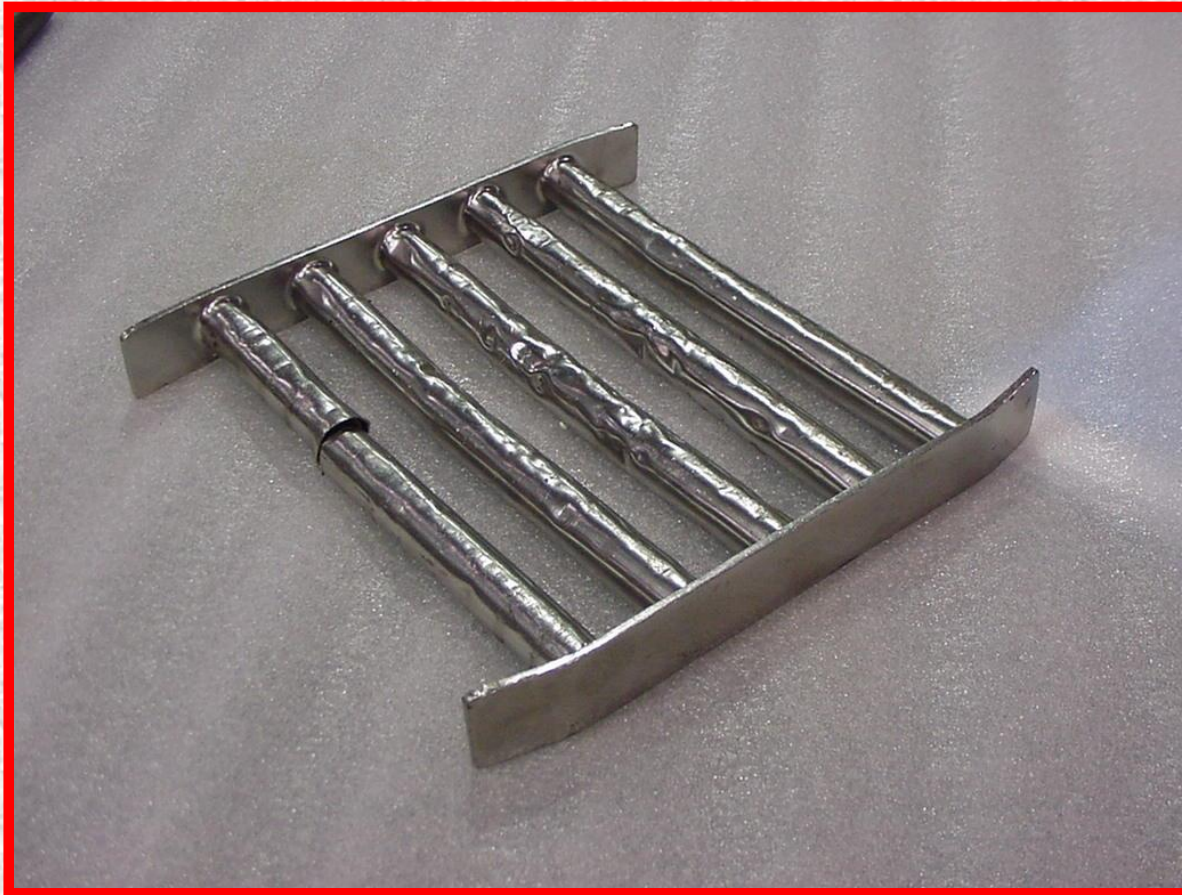
- Regular Cleaning Schedule  
(Weekly - Daily - Per Shift - Hourly)
- Sign Off Cleaning Log - best for QC
- Spot Checks are good





# CHECKING FOR **ABUSED** MAGNETS

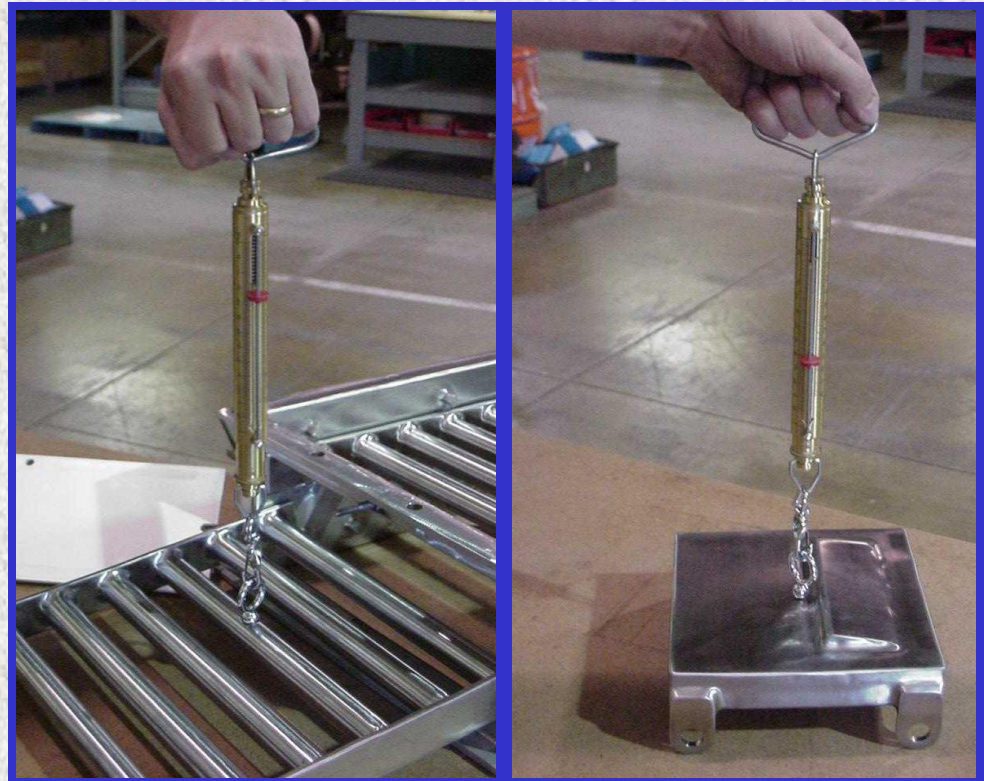
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# REASONS FOR CONTINUAL TESTING of Magnetic Equipment

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1. Quality Control Verification
2. Evaluating Magnetic Equipment
3. Comparing Potential Upgrades





# Common Metal Detectors in Flour Mills

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**QUICKTRON FREE FLOWING**

**Free-Falling Flour - Before Sacking**

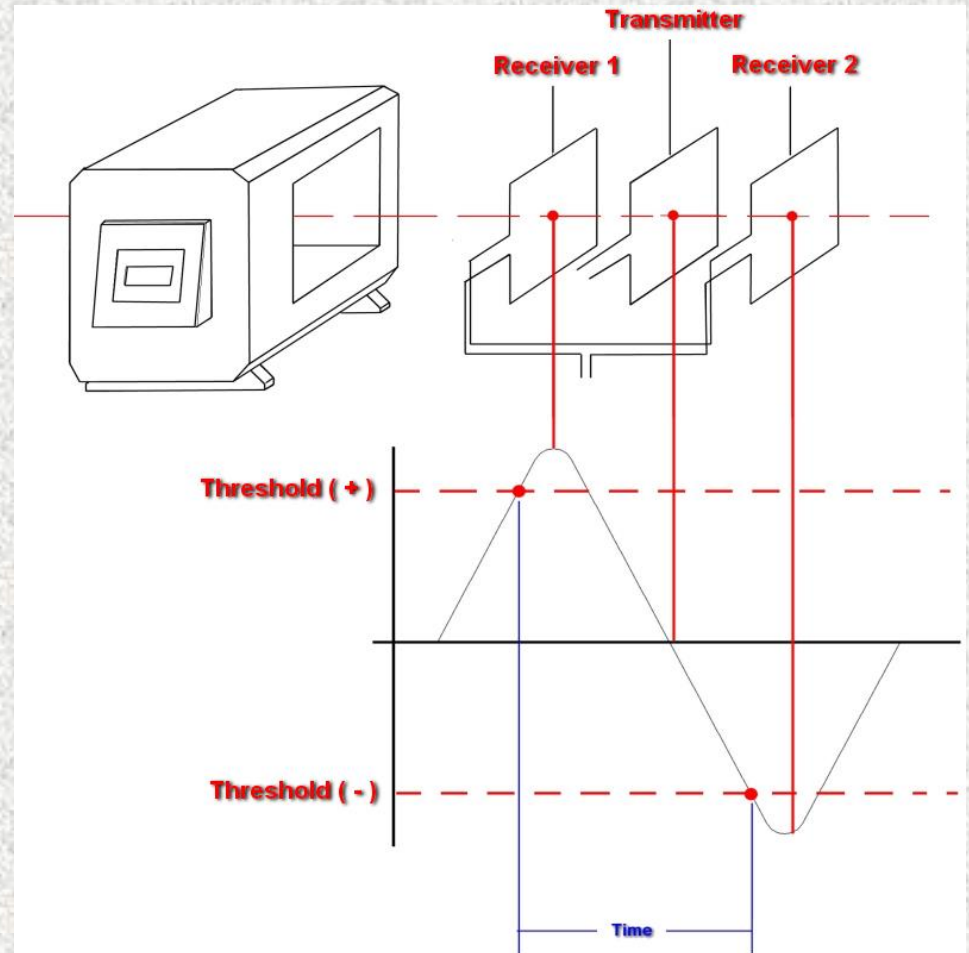


**C-COIL DETECTORS**

**Conveyor - Sacked Flour**

# Theory of Detection

- A signal is generated as the metal passes by the first receiver
- An opposite signal is generated as the metal passes by the second receiver.
- When the signal passes over both thresholds, metal is detected.
- By knowing the distance between the coils, and measuring the time it takes to pass the thresholds, we can calculate the speed at which the metal moving.





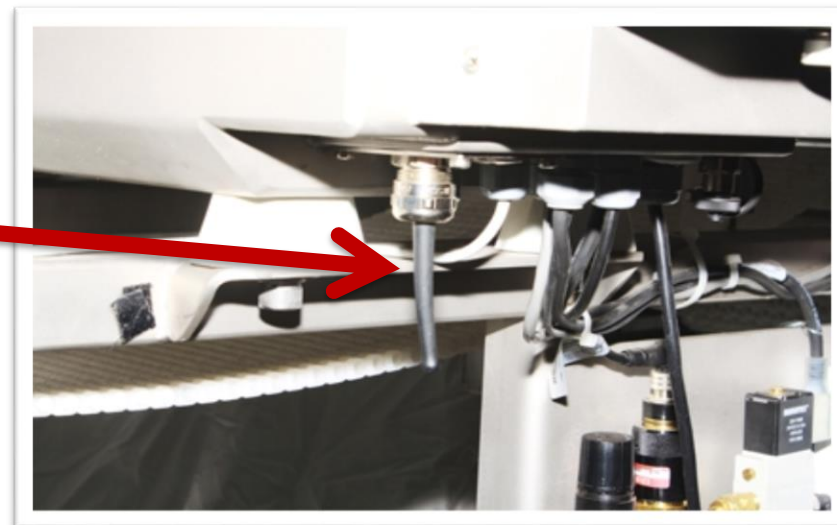
## 07 Electronics

- Full Color, Full Touch Display Control Panel
- User Access by PassCode and Name for Dual Security
- Stores up to 1,000 Product Learn in Memory
- USB Interface for Reports and Programming
- Ethernet/LAN and Wireless Connectivity Available
- Advanced Reporting for HACCP Compliance
- Automated Testing Procedures
- Standard Signal Evaluation
- imagePHASE



## Data Exchanges

Optional Wireless  
Transmitter in coil head

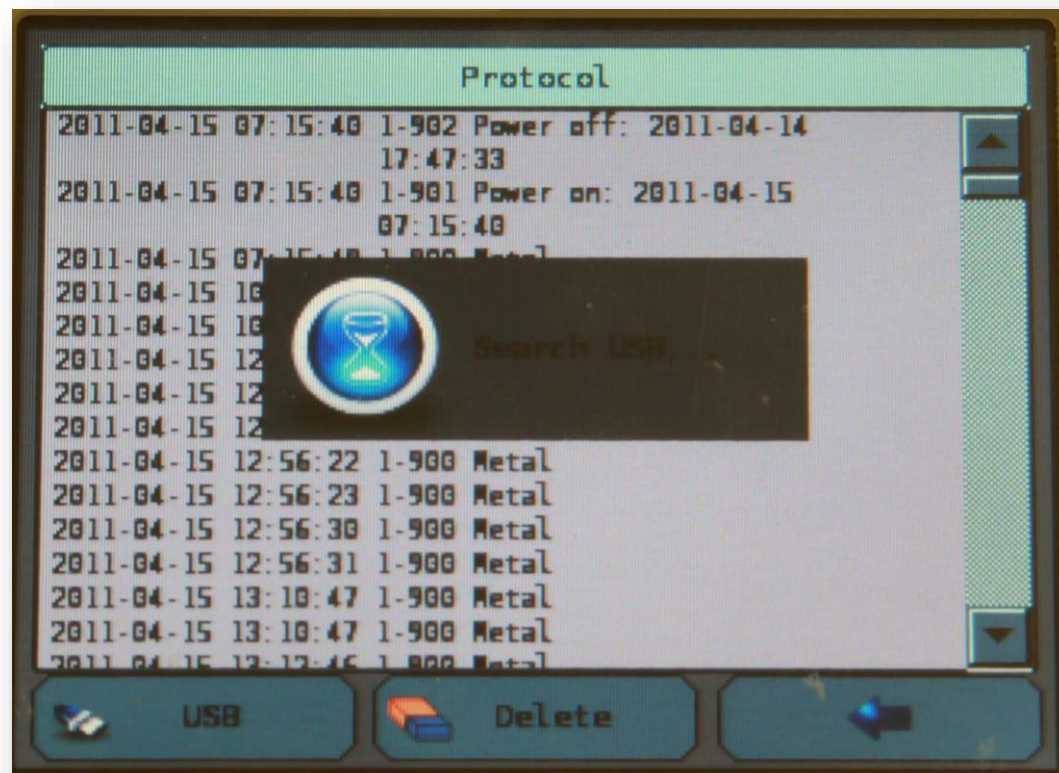


Download reports, or  
upload settings via USB



## Reports, reports, reports

- QA log with Date and Time stamped events
- Critical errors are recorded in log
- Run reports for Batch, Product or selected Date and Time range
- Download reports to USB
- Ethernet connection to retrieve and print reports



**Compliant with reporting requirements of HACCP, IFS, BRC, SQF**

## AMD 07 CI

### Key Features:

- mesuCAGE shielding for reduced MFZ
- Catalysed epoxy filled search head that eliminates water intrusion and reduces the effects of vibration
- Triple seal gasket on control housing keeps water out of electronics
- Lexan display cover mounts without holes in control housing
- All control functions inside protected environment
- Available Wi-Fi connection eliminates external cabling





# Rejecting metal contamination.

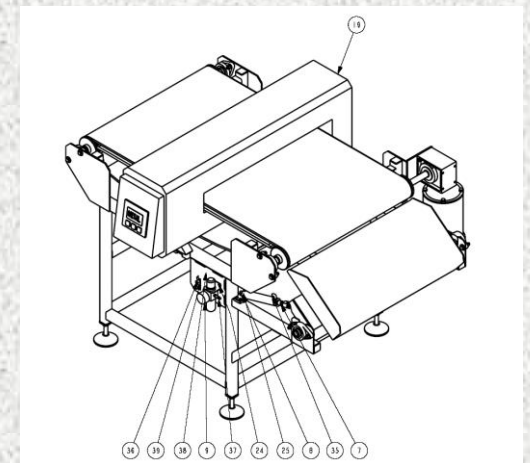
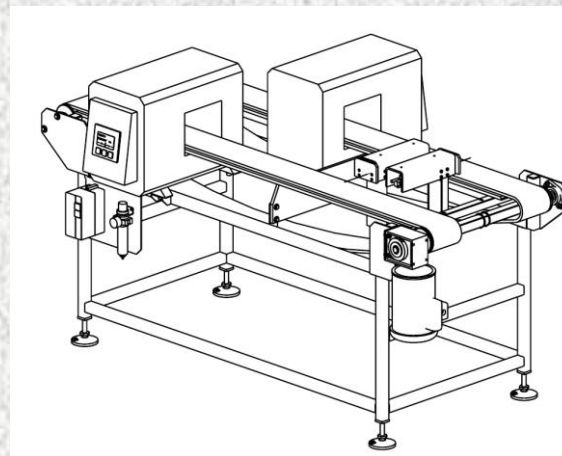
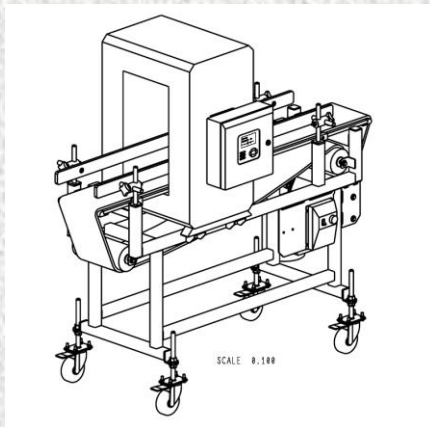
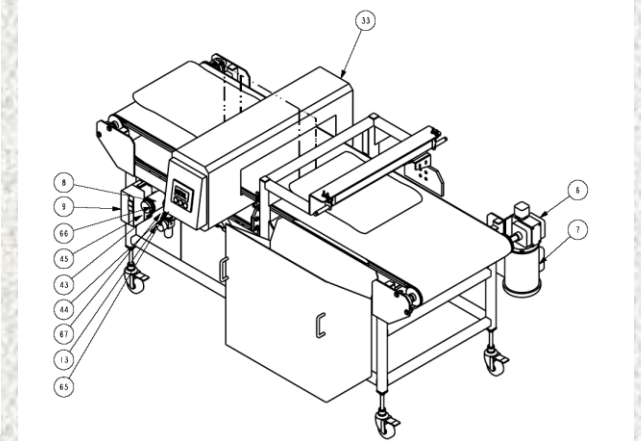
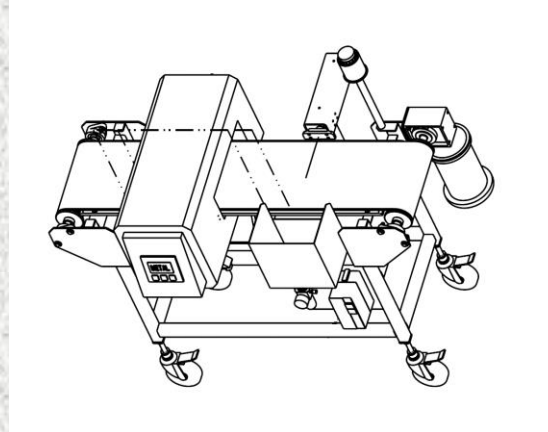
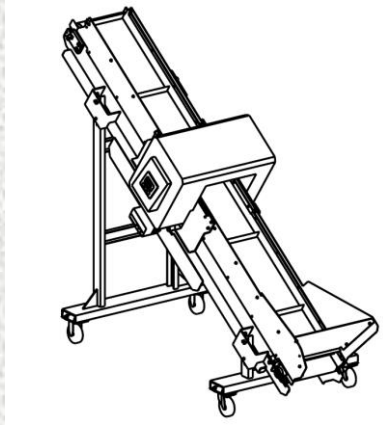


Fill prior to bagging.





# Conveyor Designs



# QUICKTRON 05 (Flap)

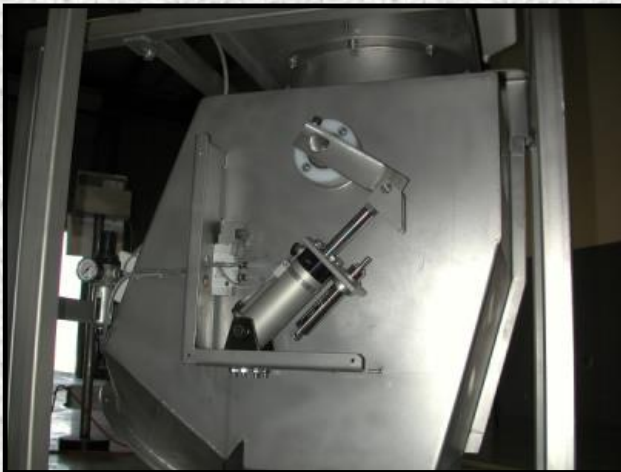


- Compact design
- RS-232 Interface
- Firmware upgradeable



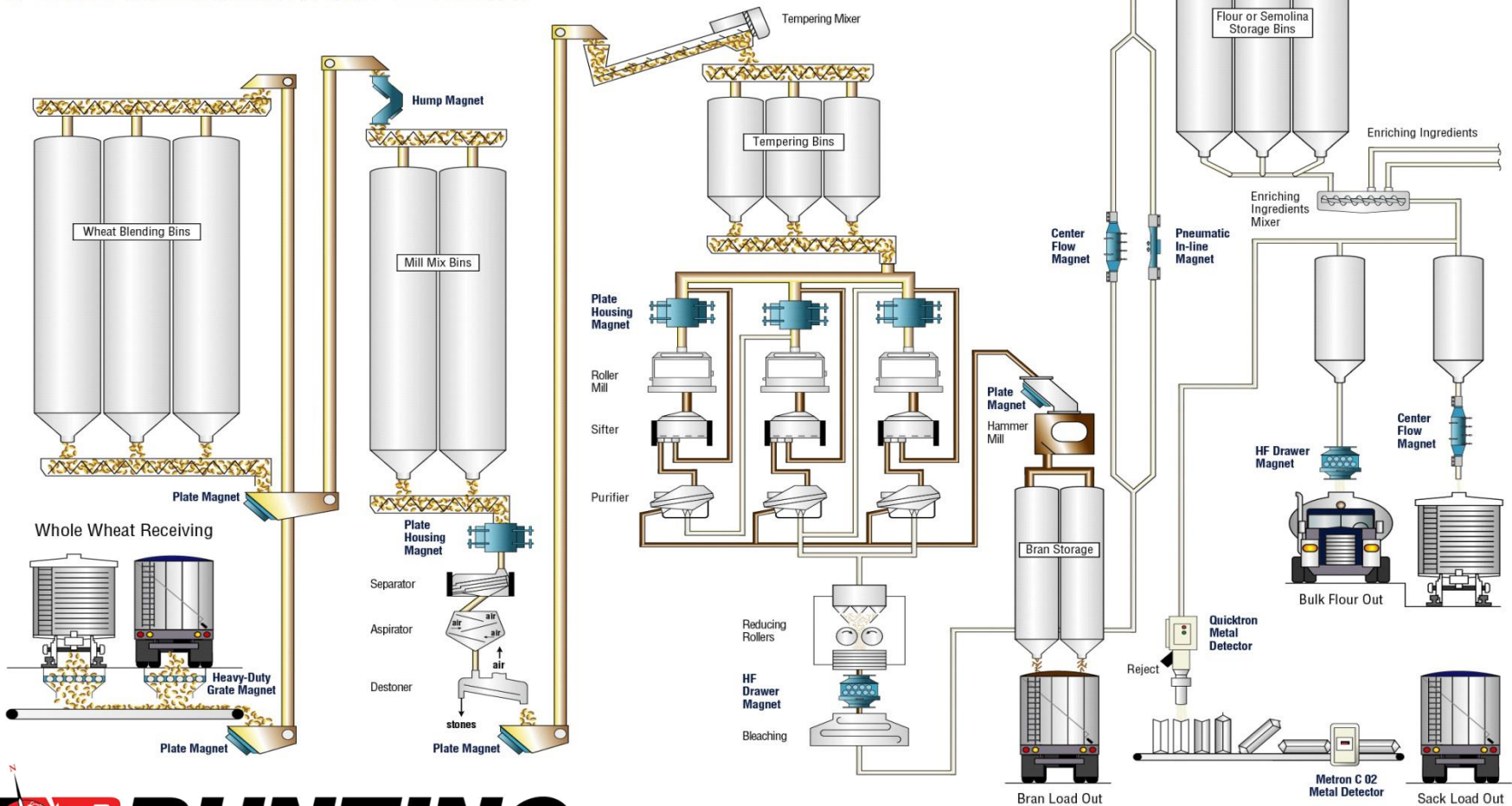


# Quicktron 05 (CB)



# A Magnetically Protected Flour Mill

## PERFECT GRAIN MILLING PROCESSING PLANT™



**BUNTING** Magnetics Co. For technical information or FREE catalog **CALL TOLL-FREE 800-835-2526**  
Outside U.S. and Canada 1-316-284-2020

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# MAGNETIC SEPARATION AUDITS



For  
**FLOUR MILLS**