Hydrotex

Your Lubrication Solution Partners®

LUBRICATION RELIABILITY in Flour Milling Operations

- General Equipment Applications -

Milling operations vary in size, scope and equipment complexity

EVERYTHING THAT MOVES……

NEEDS LUBRICATION!

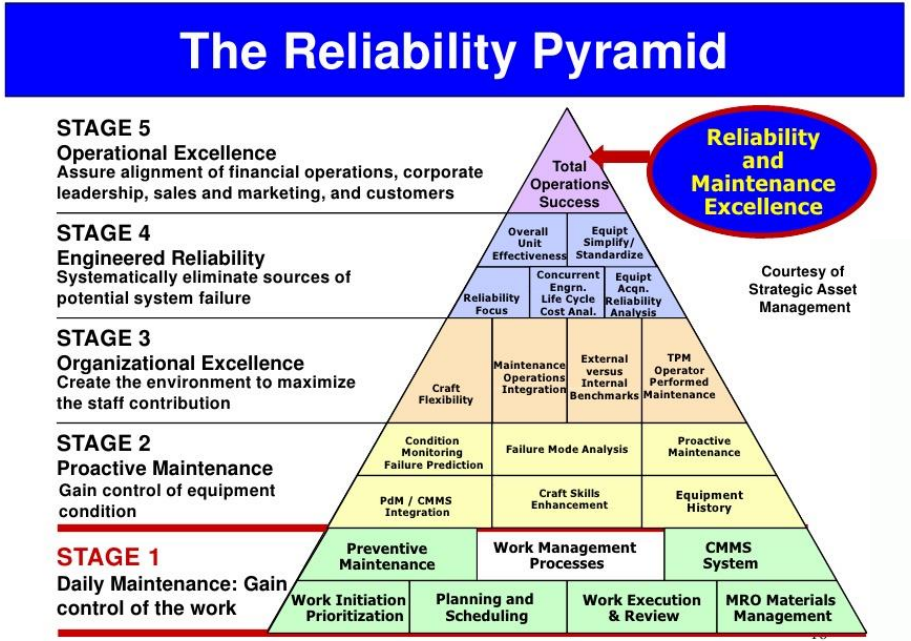
Types of Maintenance Programs

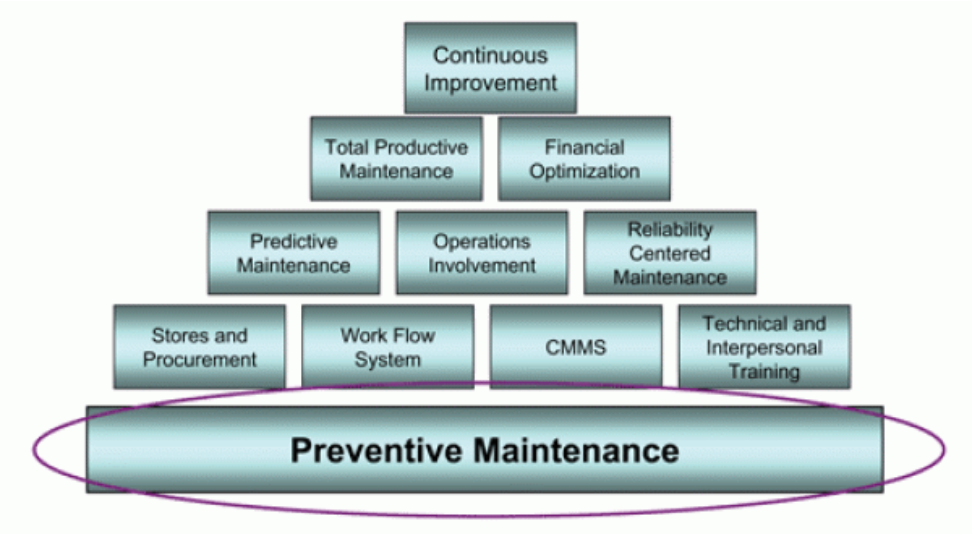
- **Reactive or Run-to-Failure** **55% - 60%**
- **Preventative** **30% - 35%**
- **Predictive** **10% - 15%**
- **Other** **3% - 5%**
    - **Condition Based Maintenance**
    - **RCM - Reliability Centered Maintenance**
    - **TPM – Total Productive Maintenance**
    - **Plus Many, Many, Many More**

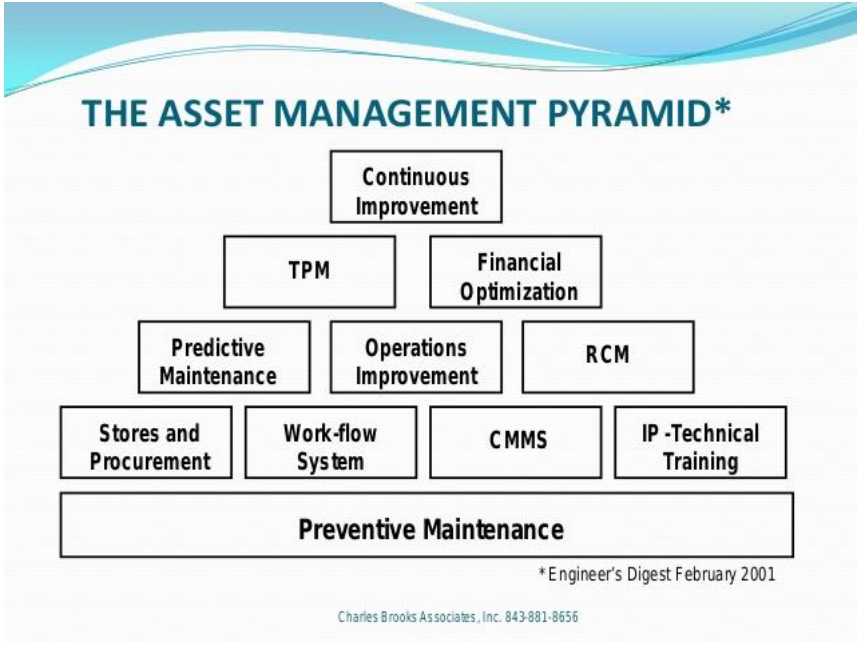
Looks Nice….

Does It Work….

How do WE Make it Work?

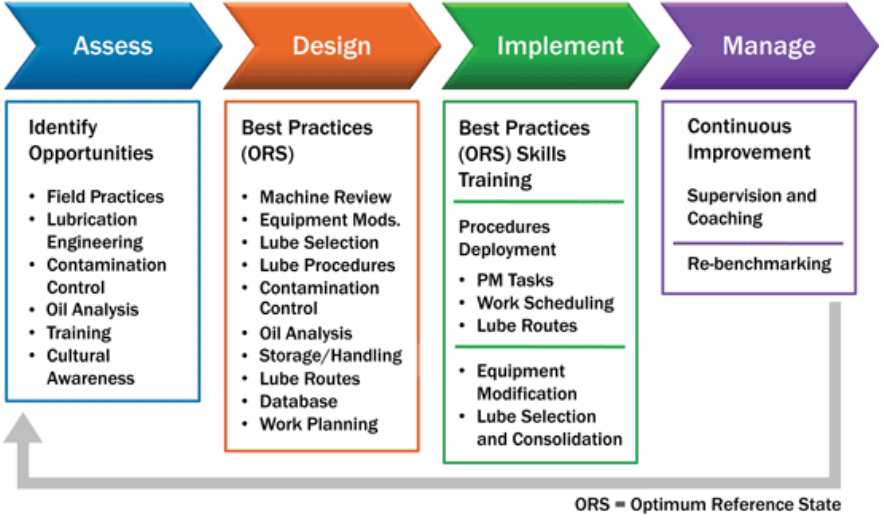






Everyone Has Different Viewpoints?

Everything Costs Money?



What Will Work For Your Operation?

Are You Doing Too Much PM?

16 Ways to Save Time and Money on Preventive Maintenance

Unless you've been living on another planet for the last fifty years, you already know that the case for doing preventive maintenance is watertight.

Done right, preventive maintenance will preserve, protect and extend the life of your equipment – and boost overall return on assets.

So here's the question: Why are most maintenance and reliability professionals so unhappy with their PM programs?

Surprisingly enough, according to the consultants at Life Cycle Engineering, just 22% of maintenance managers are satisfied with their current programs. Here are the two biggest complaints:

PM Consumes Too Many Resources

Many maintenance managers believe their PM program is simply bigger than it should be. They feel like they don't have enough manpower to manage all of their PM's along with the other important maintenance work, too.

Lack of Results

Despite all of the time and money being spent on preventive maintenance, there are still way too many unexpected equipment failures.

Case in point: During a recent chemical plant tour, the frustrated maintenance manager said, "We just PM'd that machine, and it failed a short time later anyway. So why didn't we catch the problem with the PM?"

Why indeed.

So in a nutshell, the problem with preventive maintenance is that it takes too much time and produces too little results.

Allied Reliability "Are You Doing To Much PM" 2014

Concerns of PM Processes & Practices

"Sure, I know. Preventive maintenance helps avoid unplanned downtime and breakdowns. But **PMs take a lot of time and cost a lot of money**, and they **don't seem to make that much difference** in the way our equipment runs. We've got excess capacity anyway, and we're not running production on all shifts during the week. So**, the downtime and repairs aren't costing us that much in lost production**. We're able to keep up with customer orders. **I really don't see why we need to spend time and money on a PM program**."

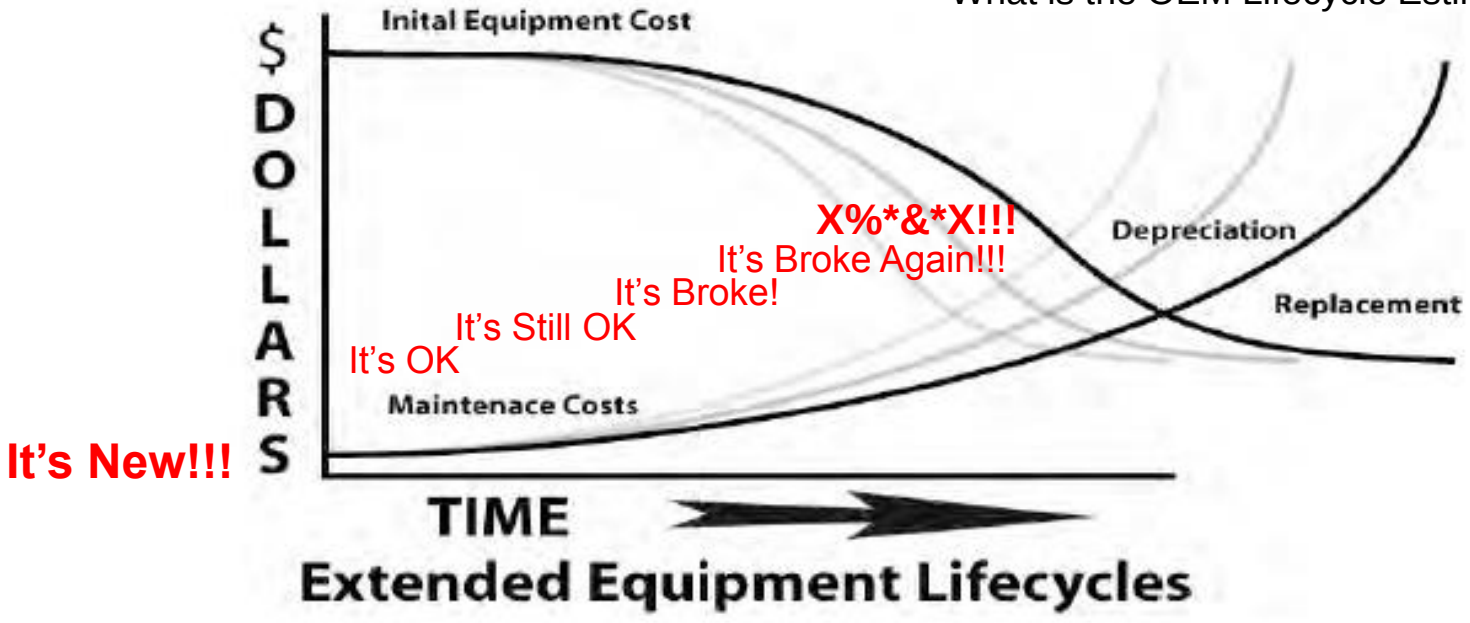
Maintenance Becomes Deferred!

How much time and money are you willing to spend on repairs and downtime?

America’s roadways. **Deferred maintenance** causes millions of dollars in damage to American automobiles every year. Lack of maintenance leads to the development of potholes at best, and roadway failures at worst. Currently, **32%** of America's major roads are in poor or mediocre condition, costing U.S. motorists **$67 billion** a year or **$324** per motorist, in vehicle repairs and operating costs, according to the 2013 Report Card for America’s Infrastructure by the American Society of Civil Engineers, which also cites roadway conditions as a factor in **one out of every three** traffic fatalities.

What is the **COST** of Equipment Ownership

What is the OEM Lifecycle Estimate?



What are the Equipment Lifecycle Costs?

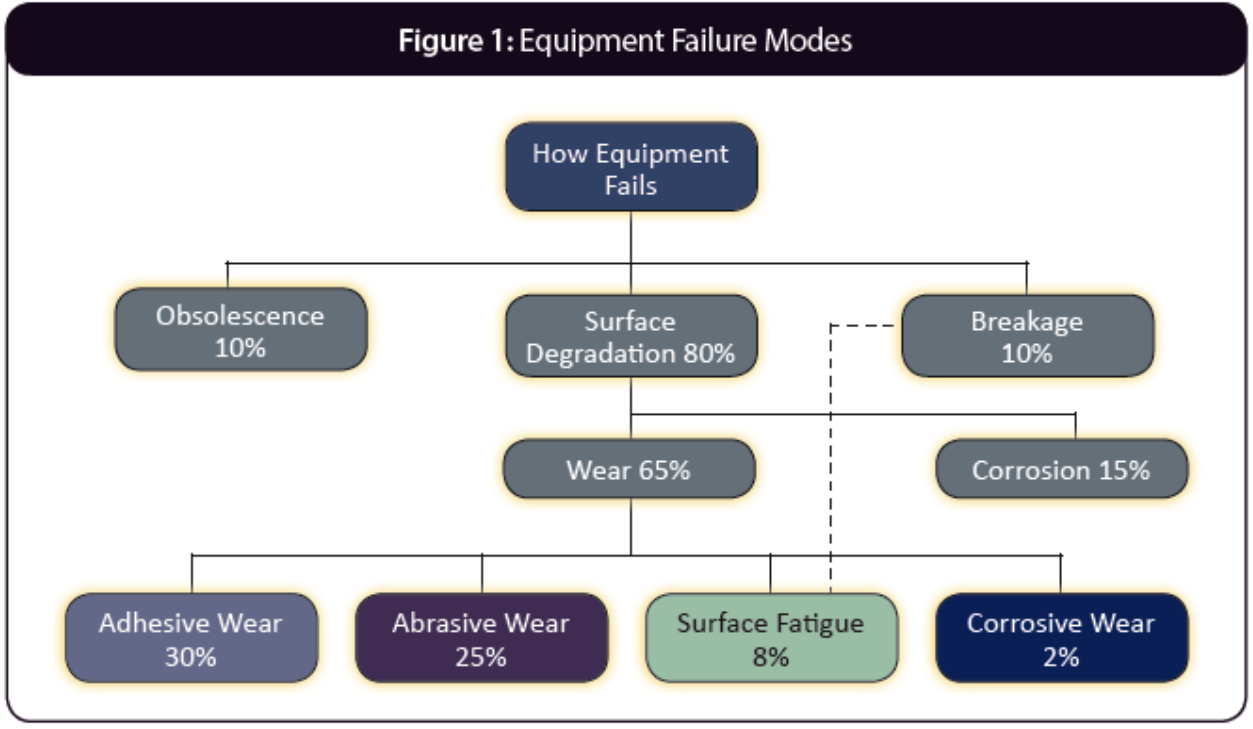
Milling operations vary in size, scope and equipment complexity

- **Critical Equipment – 80 / 20 Rule**: 20 % of equipment produces 80% of product!
- **RCA – Root Cause Analysis**: What are the potential component failures and failure ratios of critical equipment and components?
- **Lubrication Reliability Management Process or Program**?
- **Trained Lubrication Specialist?** Lowest Paid or Highest Paid individual in maintenance department?
- **Maintenance Practices**: What are your Reliability Practices and Services utilized?
- **KPIs**: What are your Key Maintenance Performance Indicators?
- **OEE & Maintenance Program Efficiency**: Breakdown or Reliability Centered Maintenance?

RCA or RCFA

Different Lubricant Regimes Address Different Failure Modes!

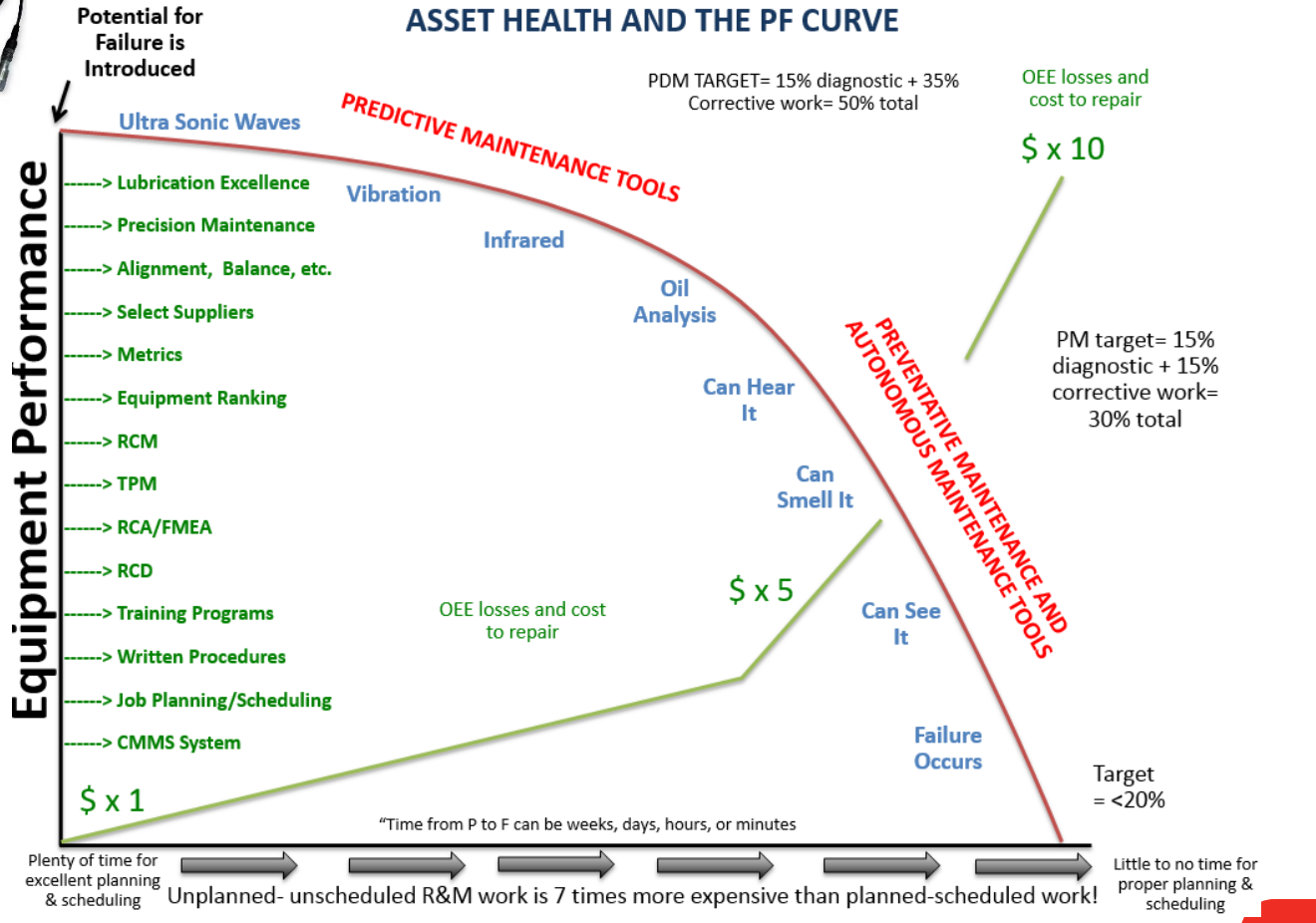
Is Your CMMS Up To Date?



Uptime Magazine Dec / Jan 2015 John Cummins – Hydrotex Vice President of Product Development

Failure Curve

demonstrates the relationship between machine breakdown, cost, and how it can be prevented.



- **Lubrication Excellence – Skills and Knowledge of Best Lubrication Practices**
- **Precision Maintenance – Skills Driven Maintenance & Repair (Millwright)**
- **Ultrasound, Vibration, Thermal Imaging, Oil Analysis, Alignment, Balance, etc. -**
- **Select Suppliers – Business Partners & Solution Providers**
- **Metrics – KPIs (Key Performance Indicators), Measurable Outputs**
- **Equipment Ranking - Criticality**
- **RCM – Reliability Centered Maintenance**
- **TPM – Total Productive Maintenance**
- **RCA / FMEA / RCFA – Root Cause Analysis / Failure Mode Effects Analysis / Root Cause Failure Analysis**
- **RCD – Residual Current Device for Electrical Testing**
- **Training Programs – Personal Development & Skills Advancement**
- **Written Procedures - SOPs**
- **Job Planning/Scheduling – Work Order, Manpower, Operations, etc.**
- **CMMS System – Computer Maintenance Management System**
- **OEE – Availability X Performance X Quality – measurement of efficiency of a manufacturing operation**
- **R&M – Repair and Maintenance**

Lubricant Myths & Mistakes

- Oil is Oil and Grease is Grease!
- If a LITTLE bit of Grease is Good….
- New Oil is Clean……..
- No One Wants to Be the Lube Guy!
- How many lube points are there?
- It doesn’t matter what position the gearbox is in……
- Others……

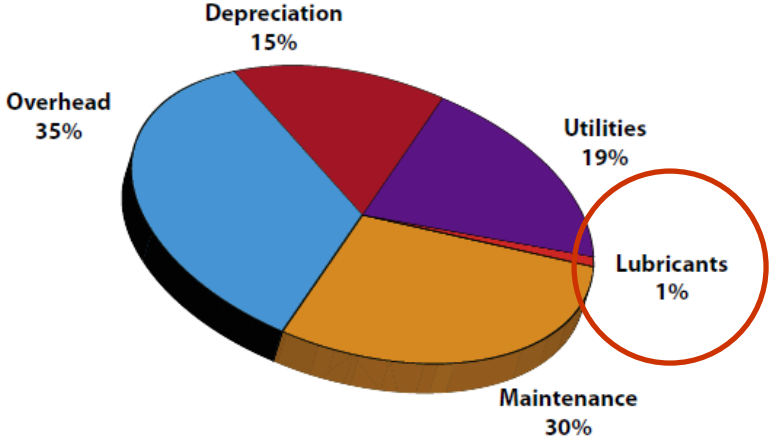
Maintenance and Reliability Groups, Conferences & Training

- STLE - Society of Tribologist and Lubrication Engineers
- SMRP - Society of Maintenance and Reliability Professionals
- PRMP - Plant Reliability and Maintenance Professionals
- MCRG - Maintenance Centered Reliability Group
- RMC - Reliability Management Council
- Reliability 2.0 Conference
- Reliability & Maintenance Conference
- Reliability Plant 2015 Conference
- International Council for Machinery Lubrication (MLA I, II, MLT II, III, LLA I)
- Lifecycle Engineering
- Marshall Institute
- Allied Reliability
- IDCON
- Lifetime-Reliability
- Hydrotex Lubrication University

- **Cost $**
- **Value**
- **Loss work**
- **R.O.I**
- **Cross Training**

The Bottom Line Impact of Lubrication

Industrial Lubricants Typically Account for just 1% of Plant Operating Costs



The proper selection and application of lubricants will improve overall profitability.

- **Utilities:** Proper lubrication can reduce energy usage over 10%.
- **Maintenance:** Over 30% reduction in maintenance expense can be achieved with proper lubrication and Lubrication Management.
- **Overhead:** Reduce spare parts inventory and labor costs with extended maintenance intervals.
- **Depreciation:** Equipment lasts longer and improves ROI.

Milling Operations L.E.T.S.

Load varies on equipment depending on operation and configuration.

Environment varies – exterior and interior applications, explosive conditions due to high dust levels, flour or corn dust acts as an insulator on equipment raising operating temperatures, contaminates grease and oils. Equipment may be located at top of buildings to lower or basement levels.

Temperatures vary depending on where mill is located, equipment locations and operating conditions as well as age of equipment.

Speeds vary depending on production and equipment application specifications. RPM's may run from 50 to 3600.

Operations and maintenance personnel are limited due to production costs and competition.

Asset Lubrication Practices

Identify components and develop SOPs for correct lubrication processes

Motors

Gearboxes

Bearings

Chains or Belt Drives

Slides & Ways

$ $ $ $ $ $ $ $

Pneumatics

What is the COST of ownership?

Other Applications

Asset Lubrication Practices

- Define **Criticality of Assets**.
- Identify **correct lubrication, points, amounts and frequencies** using OEM recommendations and L.E.T.S.
- **Consolidate** lubricants to reduce cross contamination issues with labeling program.
- **Implement** Oil Analysis practices as needed.
- **Utilize** Ultra Sound, Vibration Analysis, Thermal Imaging, Fluid Filtration.
- **Train** maintenance and operations personnel to preform lubrication tasks.
- **Develop** SOPs and Work Orders that define lubrication specifications.
- **Implementation of processes and practices** over time
- **Action** planning – **Responsibility & Accountability**

Elevator Area:

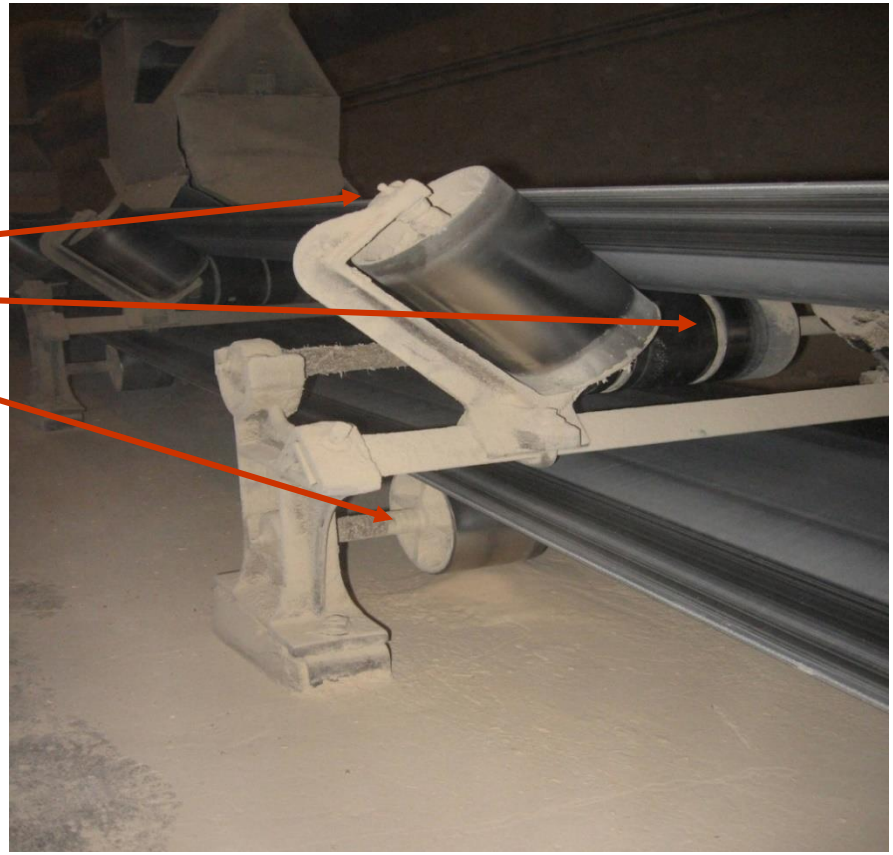
- Head House
- Sifter Area
- Tripper/Conveyors
- Truck & Rail Load Out Areas

- ❑ Motors
- ❑ Belt or Chain Drives
- ❑ Gear Boxes
- ❑ Motor / Gear Reduces
- ❑ Bearings
- ❑ Bucket Elevators
- ❑ Drag Conveyors
- ❑ Tripper / Belt Conveyors
- ❑ Blower Systems
- ❑ Air Locks
- ❑ Hydraulic Systems

Single Point Lubricators on all points where applicable

Belt Conveyors

- V-Belt Trough Bearings
- Intermediate Bearings
- Support / Return Bearings



- ❑ Motor
- ❑ Belt or Chain
- ❑ Gearbox
- ❑ Drive / Head Bearings
- ❑ Support Bearings
- ❑ Take Up / Tail Bearings

Installation, Care and Maintenance

Lubrication

All Rex idlers are prelubricated at the factory and are ready for operation. All external lubrication lines (if added by the customer) should be filled with grease when installed to ensure that the idlers will get grease when the lubrication cycle is started.

Under normal conditions, relubrication should be every 4000 to 6000 hours until a clean bead of grease appears around the final opening of each seal.

The lubrication cycle can be lengthened in applications where operating conditions are clean, dry, of moderate temperature and slow speed. The cycle should be shortened in applications where severe dirt, high humidity, elevated temperatures, high speeds, free water, prolonged shutdown, or other extreme conditions are encountered. Periodic inspection during the first few years of operation will provide the best determination of required relubrication frequency.

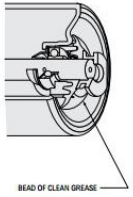
Rex idlers are greased at the factory with Lithium EP grease with a NLGI #2 consistency having the following characteristics:

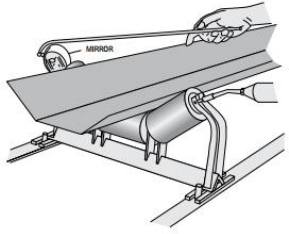
1. Lithium soap base
2. Mineral oil
3. Worked penetration 265-295° 77°F
4. Operating range of +225°F to -10°F
5. Bleed rate 3% maximum

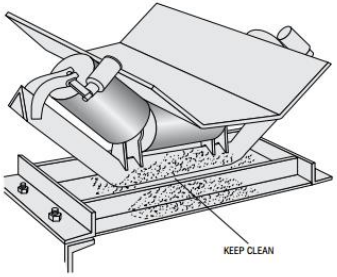
It is recommended that an equivalent grease be used. When using any other type of grease, it is imperative that it be compatible with the original grease.

When lubricating idlers, the use of high pressure equipment is not only unnecessary, but is actually undesirable unless used with great care. High pressure may cause damage to bearings and seals. It is recommended that a VOLUME TYPE GREASE GUN BE USED: one that delivers an ounce of grease per seven to ten strokes of the lever.

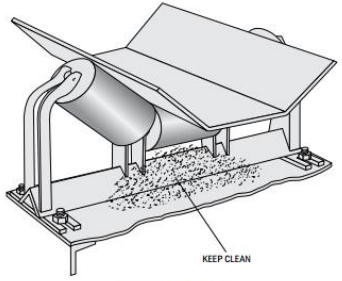
All fittings should be wiped clean before lubricating so as not to introduce dirt into the system.







TROUGHING TRAINING IDLER



TROUGHING IDLER

Inspection and Maintenance

A scheduled maintenance program, followed faithfully by trained people, can usually help avoid costly interruptions in production and repairs to equipment. Many operators make a cursory check at least once a day to find obvious problems. A more comprehensive inspection is made at periodic intervals.

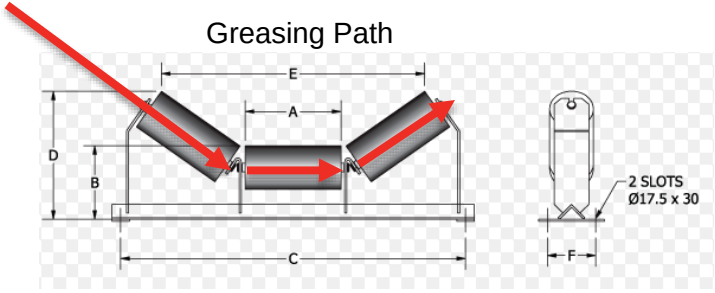
Inspection should entail the following:

1. Inspect belt for breaks and cuts or for indications that the belt edge is rubbing.
2. The belt should be centered on the idlers.
3. Check loading areas — material should be loaded evenly, and on the center of the belt.
4. Rubber skirts on chutes and skirt plates are adjusted to prevent spillage.
5. Belt cleaners are properly adjusted and working.
6. Rex Idlers are designed to be self cleaning. Accumulation of material must not be allowed to prevent idler rolls from rotating or training idlers from pivoting.
7. All idler rolls should be rotating. A stalled roll will cause excessive roll shell and belt wear and should be replaced.

Re-lubrication = 4,000 to 6,000 hours

- 24 x 6 x 52 = 7,488 hrs. annually
- **1.9** times per year or **1.3** times per year
- Recommend **1 ounce** of grease per **7** to **10** strokes of the lever.
- All fittings should be wiped clean before lubricating

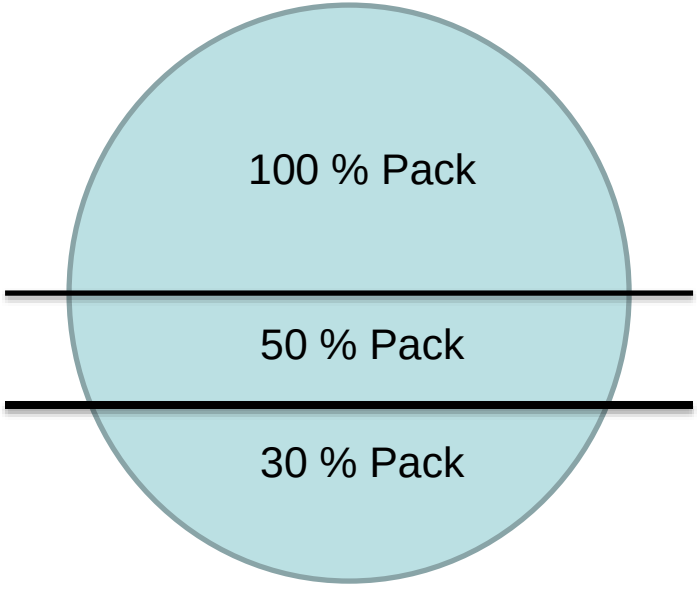
Greasing Path



Purge Bearing?

Bearings & Greasing

- Design and Application
- Installation Practices
- Load, Environment, Temperature & Speed
- PM verses Condition Based Maintenance



High Load / Low Speed

Light Load / High Speed

6 Different Types of Bearings and Configurations

4 Bolt Flange Bearing

What position should the bearing be mounted?

What is the bolting pattern?

What is the torque value?

Does the installation need shimming?

What lubricant comes in the bearing?

Is my current grease compatible?

How often does the OEM recommend re-lubrication

Bearing Lubrication Calculations

HYDROTEX Bearing Size Chart EXAMPLES ONLY Lubrication Amounts / Shots / Re-lubrication Cycles

Size	Bearing	ID MM	OD MM	Width MM	ID Inch	OD Inch	Width Inch	Grease Grams	Grease Ounces	Lincoln 1147 33 Strokes/1 oz. 0.030 oz.	Alemite 500-L 21 Strokes/1 oz. 0.048 oz	RPM	Re-Lubrication Weeks	RPM	Re-Lubrication Weeks
1/2"	6002	15	32	9	0.591	1.26	0.354	0.675	0.02	1	0.42	1200	140.59	1680	99.6
1"	6005	25	47	12	0.984	1.85	0.472	1.5	0.05	1.7	1.04	1200	106.35	1680	74.6
2"	6010	50	80	16	1.969	3.15	0.63	4	0.14	4.7	2.9	1200	69.04	1680	46.6
3"	6015	75	115	20	2.953	4.528	0.787	7.5	0.26	8.7	5.4	1200	49.86	1680	33.83
4"	6020	100	150	24	3.937	5.906	0.945	12	0.42	14	8.75	1200	36.51	1680	20.63
6"	6030	150	225	35	5.906	8.858	1.378	26.25	0.9	30	18.75	1200	16.79	1680	3.83

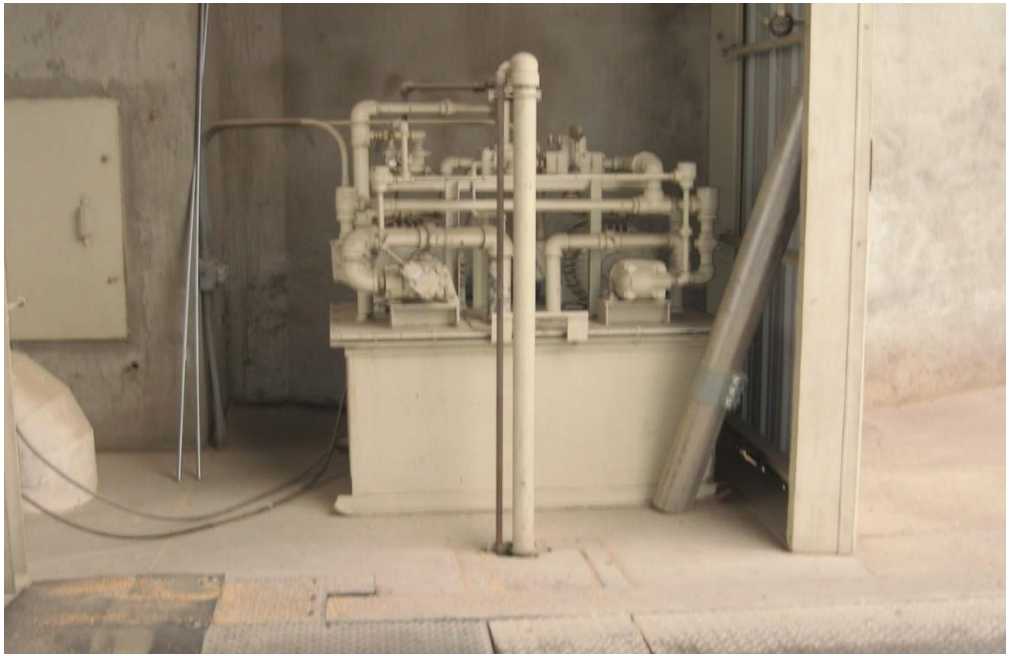
Every **20° F** degree **increase** above normal operating temperatures the life of the lubricant is reduced by **50%.**

Every **20° F** degree **decrease** in normal operating temperatures the life of the lubricant is **doubled.**

Increased temperature = increased electrical and maintenance **costs**!

Hydraulic Truck Lift

- Check Filtration Efficiency
- 4406 ISO Fluid Cleanliness Code



A **25 GPM** pump operating continuously in hydraulic oil at a 22/19/17 cleanliness level will circulate **3,500 pounds of dirt** to the hydraulic system's components each year! (Insider Secrets to Hydraulics)

Drag Conveyors - motors, gearboxes, drive and take-up bearings

Single Point Lubricators as needed

Elevator – Single Point Lubricator on motor, gear boxes and bearings

Air Handling Unit – Single Point Lubricator on motor and bearings

Fans

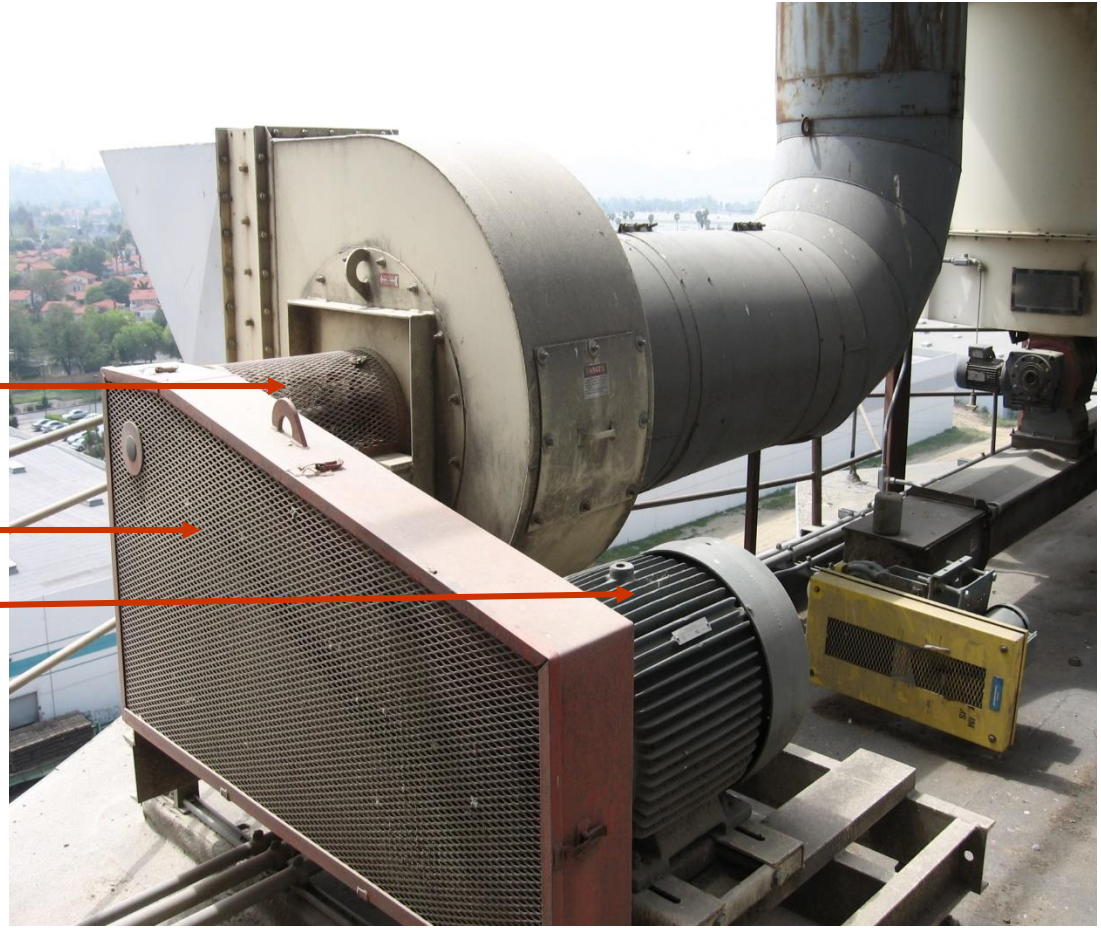
Exhaust
Air Induction Filtration

Shaft Bearings (2)

Belt or Chain Drive

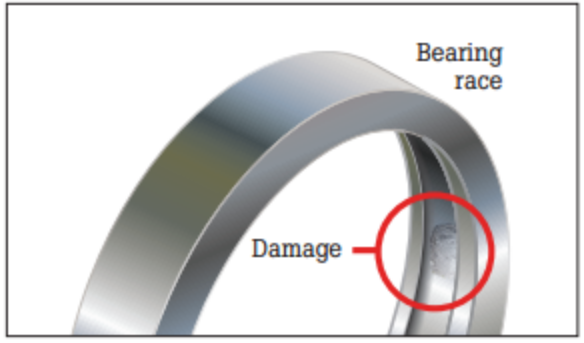
Motor Gearbox or Direct Drive

Single Point Lubricators
Motor and Bearings



Electric Motors – Polyurea Grease NLGI # 2

10 Bearing wear



A failed bearing has increased drag, emits more heat, and has lower efficiency because of a mechanical, lubrication, or wear problem. Bearing failure can be caused by several things:

- A heavier load than designed for
- Inadequate or incorrect lubrication
- Ineffective bearing sealing
- Shaft misalignment
- Incorrect fit
- Normal wear
- Induced shaft voltages

Once bearing failure begins, it also creates a cascade effect that accelerates motor failure. 13 % of motor failures are caused by bearing failure, and more than 60 % of the mechanical failures in a facility are caused by bearing wear, so learning how to troubleshoot this potential problem is important.

Impact: Accelerated wear on rotating components resulting in bearing failure

Instrument to measure and diagnose: Fluke 810 Vibration Tester

Criticality: High

13% Motors Fail Due To Bearing Failure

60% Bearings in a Facility Caused by Wear

Motor Lubrication Related Failures

30 cc single point lubricator

Screw Conveyors – motors and gearboxes
Drive & Take-up Bearings

Feed Screw Conveyors:

- ❑ Motor
- ❑ Motor/Gear Box
- ❑ Belt or Chain Drive
- ❑ Drive Bearings
- ❑ Take Up / Tail Bearings

(note angle of gearbox)

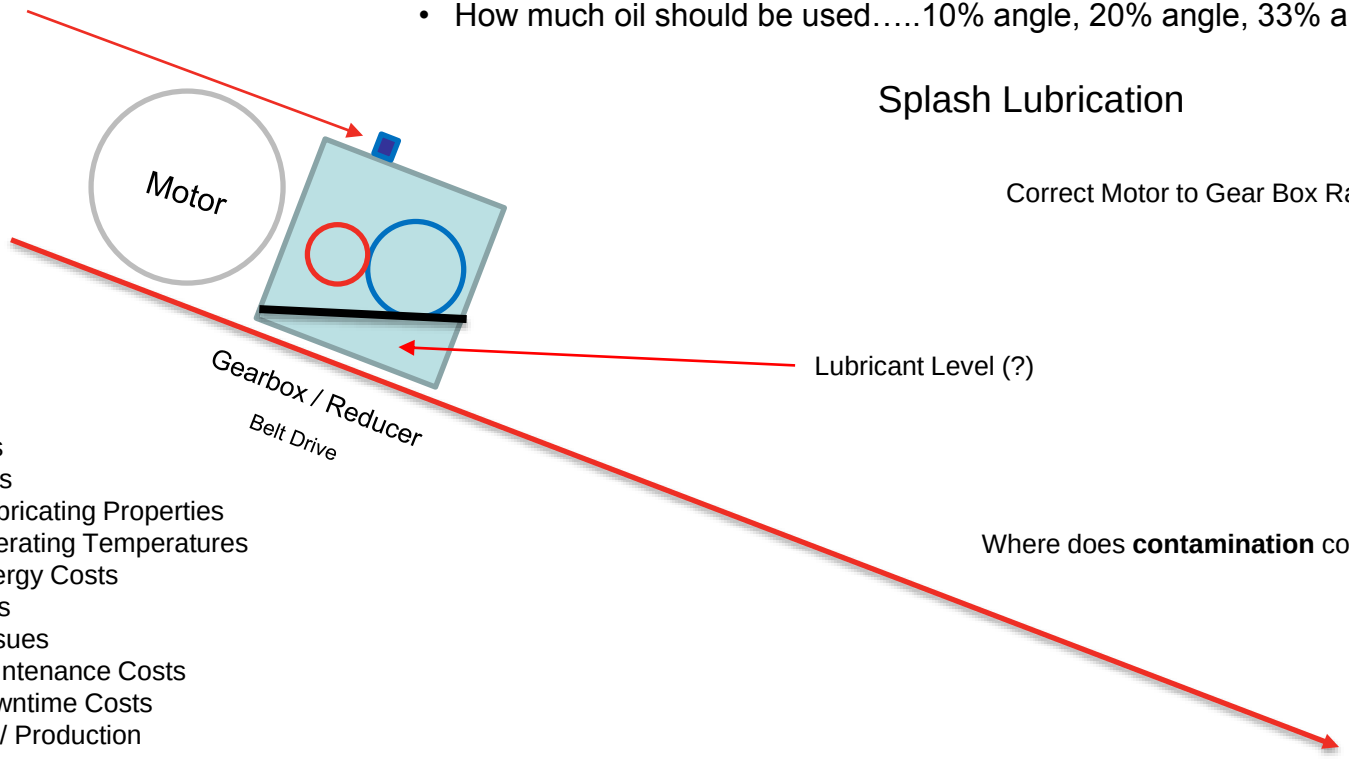
Single Point Lubricators motors, drive and take-up bearings

Gearbox / Reducer Lubrication

- How much oil should be used…..10% angle, 20% angle, 33% angle?????

Breather Cap or Desiccant with filtration
Controls contamination, moisture, etc.

WHY?



Splash Lubrication

Correct Motor to Gear Box Ratio?

Lubricant Level (?)

Where does **contamination** come from?

Oil Level
- 6 Positions
- 6 Oil Levels
- Loss of Lubricating Properties
- Higher Operating Temperatures
- Higher Energy Costs
- Seal Issues
- Bearing Issues
- Higher Maintenance Costs
- Higher Downtime Costs
- Less OEE / Production

Blower Room – motors, gearboxes and bearings **temperature tracking** is important

Blowers and Compressors are the most neglected equipment in an operation!

- Air Flow – Filtration
- Temperatures
- Desiccant Air Breathers - Reserviors
- Oil Analysis
- Which Oil – Hydrocarbon, Synthetic, Food Grade ?
- Which ISO grade – 150, 220, 320?
- How often do I change oil?
- When do I lubricate the motors?

Energy Reduction:
(varies by size of mill
and number of blowers)

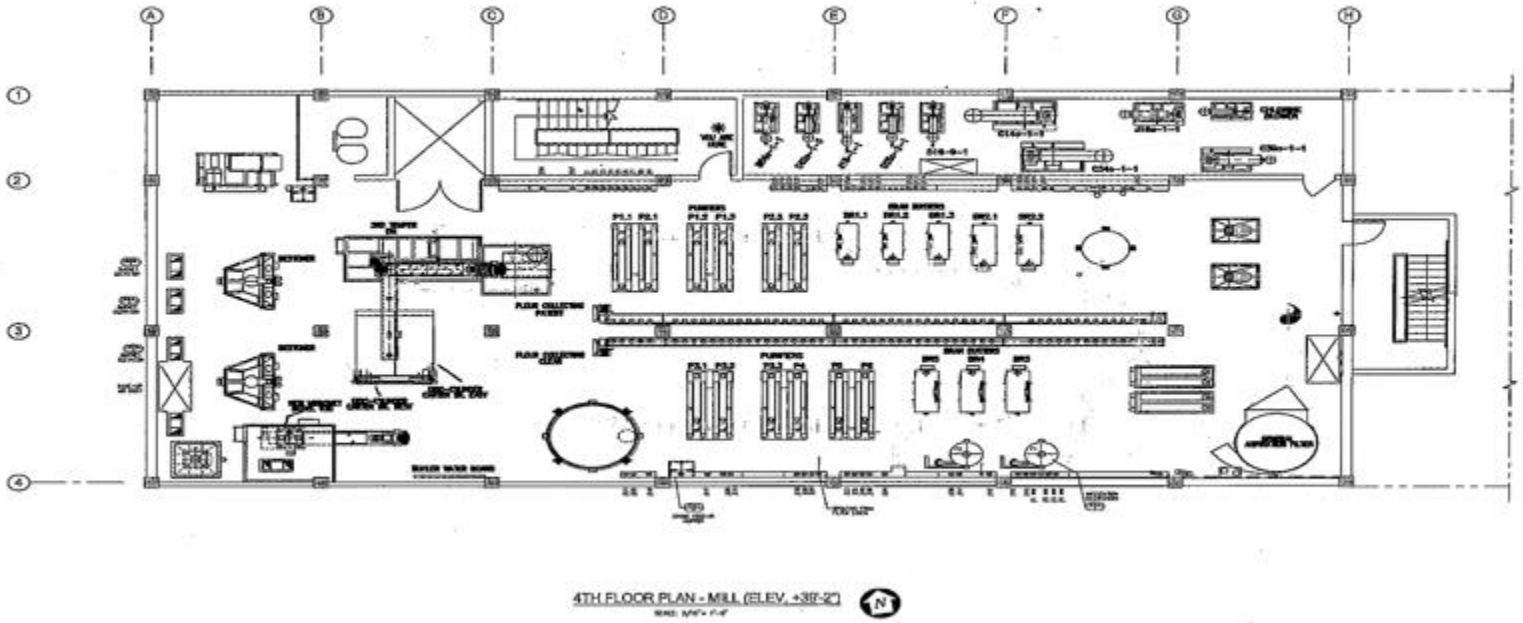
36 blowers x **$700** avg.
$25,200.00
Annual Oil Changes

Screw Type

- Air Filtration
- Right Oil & Viscosity
- Oil Filtration
- Operating Temperature

Reciprocating Type

- Air Filtration
- Right Oil & Viscosity
- Oil Filtration
- Operating Temperature



Typical Mill Floor Equipment Layout

Lubrication Operator or Mechanic

- Operator Based
- Maintenance Based
- Designated Lubrication Technician
- Automation

Critical Equipment

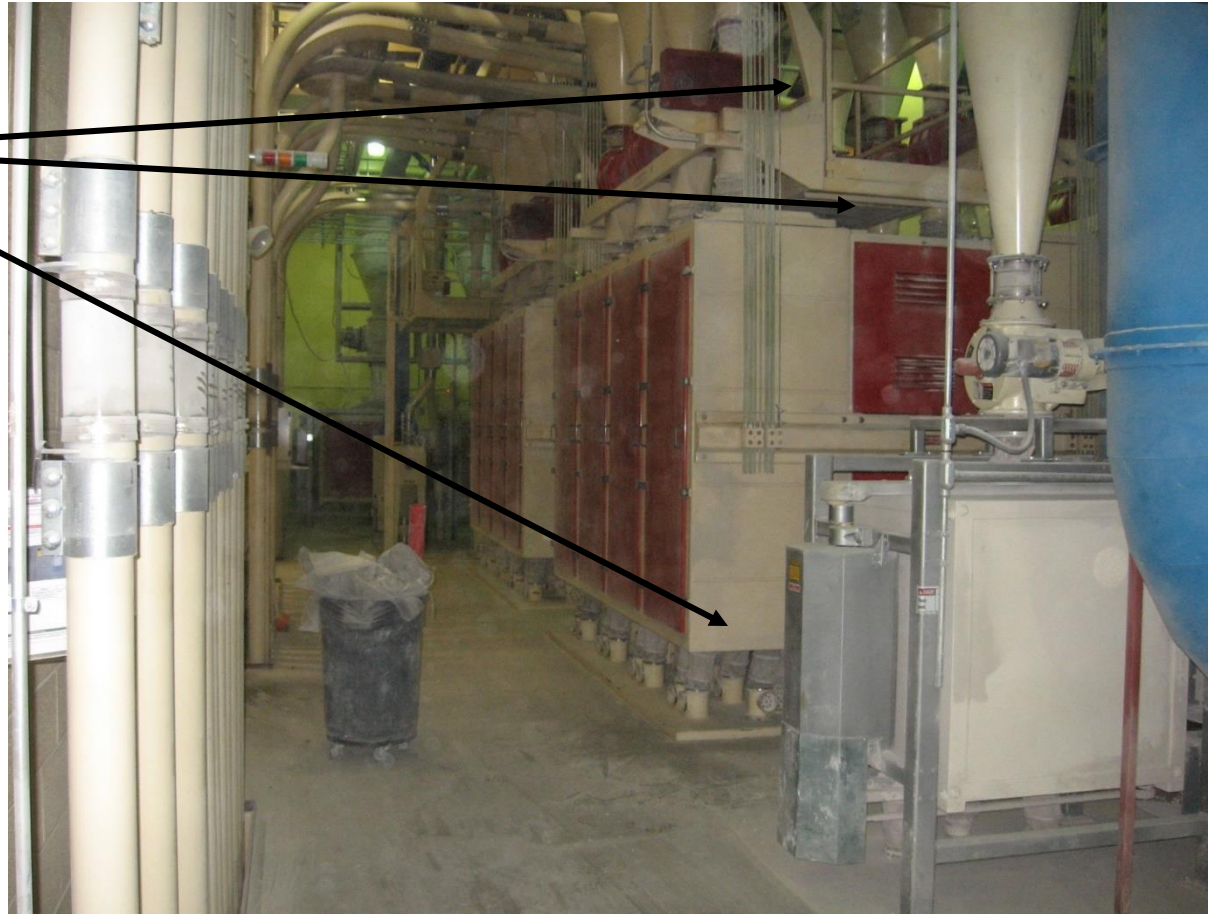
Ocrim / Buhler Roller Mill - grease motors and bearings
gear oil, hydraulic oil for brake, bearing temperature tracking

Great Western Vibratory Unit – grease bearings

Screw Conveyor – Motors, Gearbox
Single Point Lubricators - drive and take-up bearings

Giant Sifters:

- ❑ Motors
- ❑ Belt or Chain Drive
- ❑ Gearbox
- ❑ Drive Shaft Bearings
- ❑ Support Shaft Bearings
- ❑ Lower Shaft Bearings



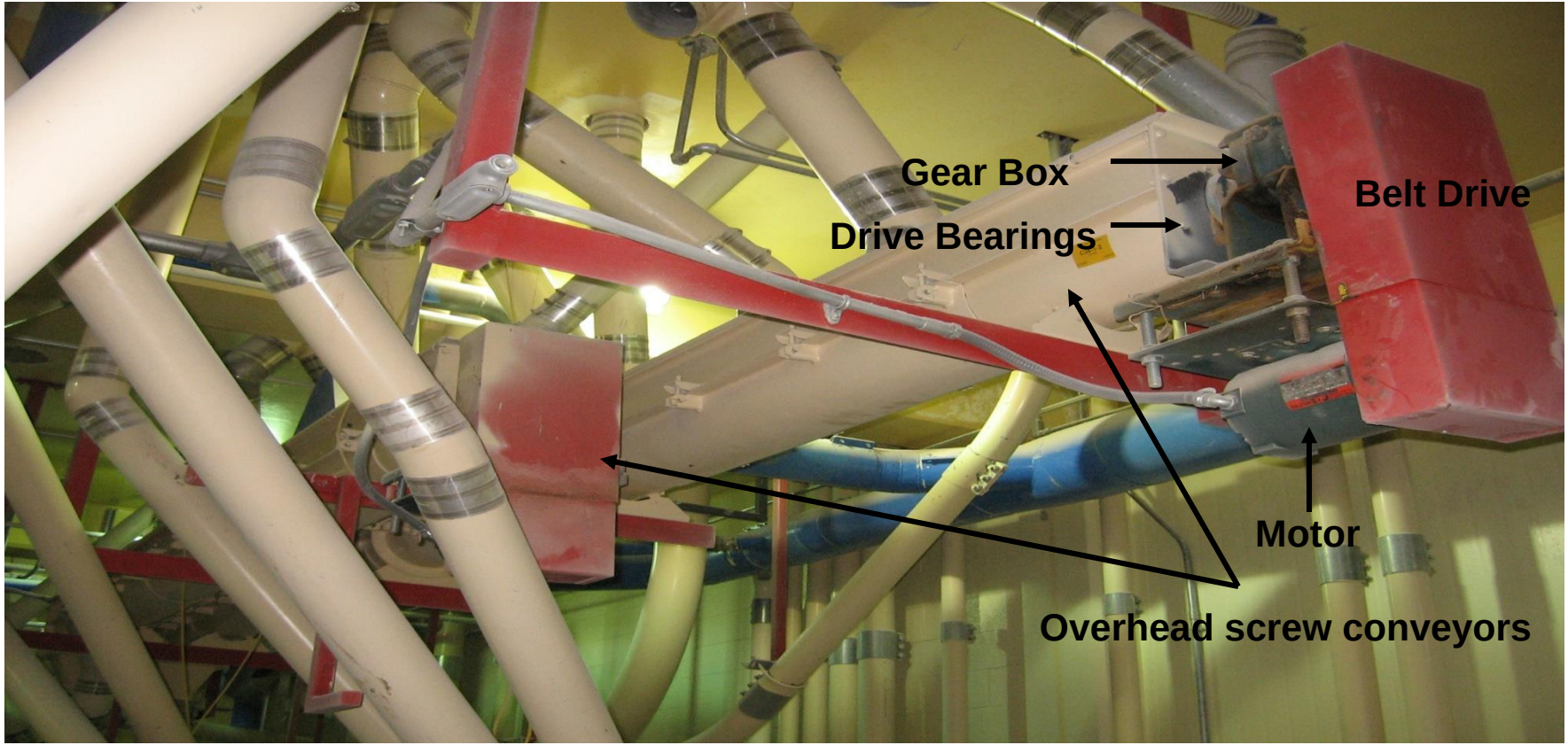
Single Point Lubricators
Upper, Support and Lower Bearings

Aspirators / Separators:

- ❑ Motors
- ❑ Belt Drive
- ❑ Upper Drive Bearings
- ❑ Intermediate Bearings
- ❑ Lower Drive Bearings

Issues:

- Bearing Failure
- Downtime Cost
- Maintenance Costs
- Lost Production
- Safety



Overhead Screw Conveyor - Motor, Belt Drive, Gear Box, Drive Bearing, Tail Bearing – How Do You Lubricate Safely?

Packaging & Bagging Area:

- ❑ Motor
- ❑ Belt or Chain Drive
- ❑ Motor-Gear Box
- ❑ Drive Bearings
- ❑ Intermediate Bearings
- ❑ Take Up Bearings
- ❑ Roller Bearings

Multiple Conveyors

Bagging and Palletizer

- ❑ Motors
- ❑ Belts
- ❑ Gearboxes
- ❑ Bearings
- ❑ Chains

Product Storage Silos or Bins

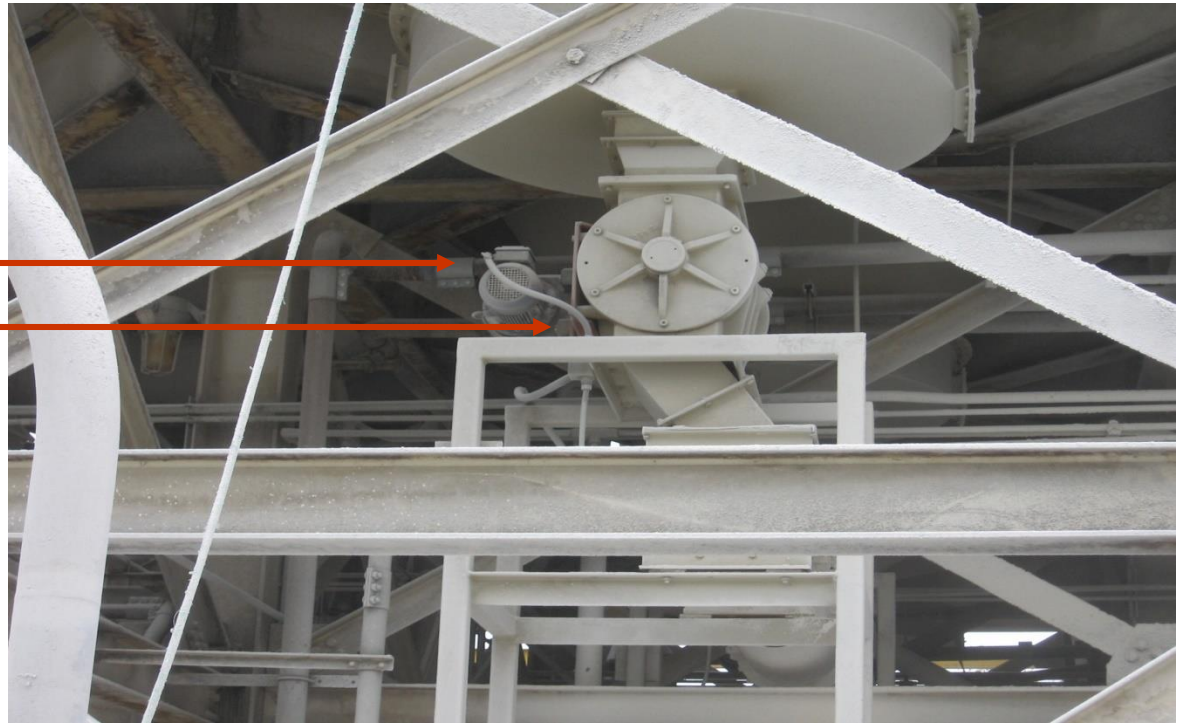
Blowers
Screw Conveyors

Single Point Lubricators
as needed

Bulk Storage Tanks:

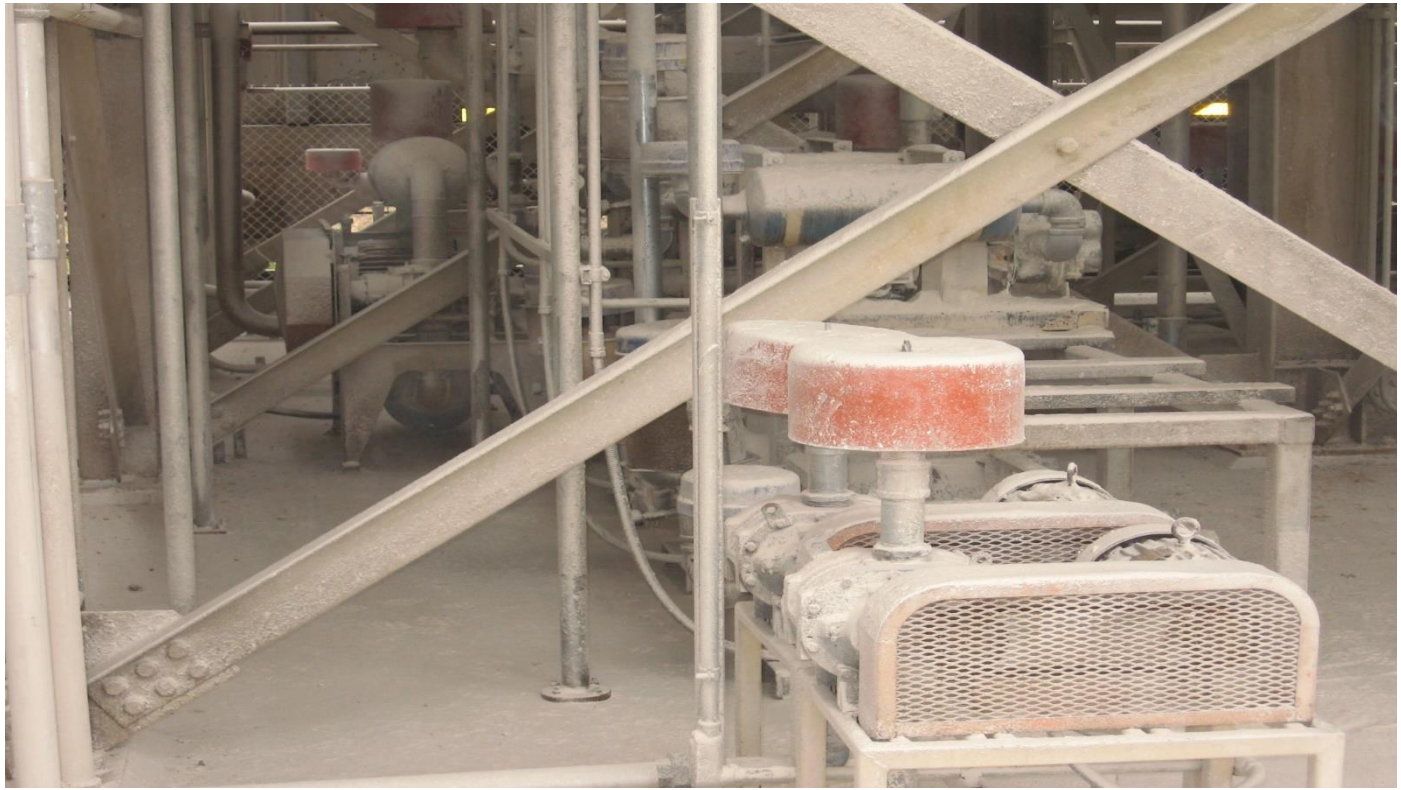
Motor / Gear Reducer
Rotary Air Lock

- ❑ Screw Conveyors
- ❑ Motor
- ❑ Belt or Chain Drive
- ❑ Gear Box
- ❑ Drive Bearings
- ❑ Take Up / Tail Bearings



Blower Area:

Transfer of finished product to packaging

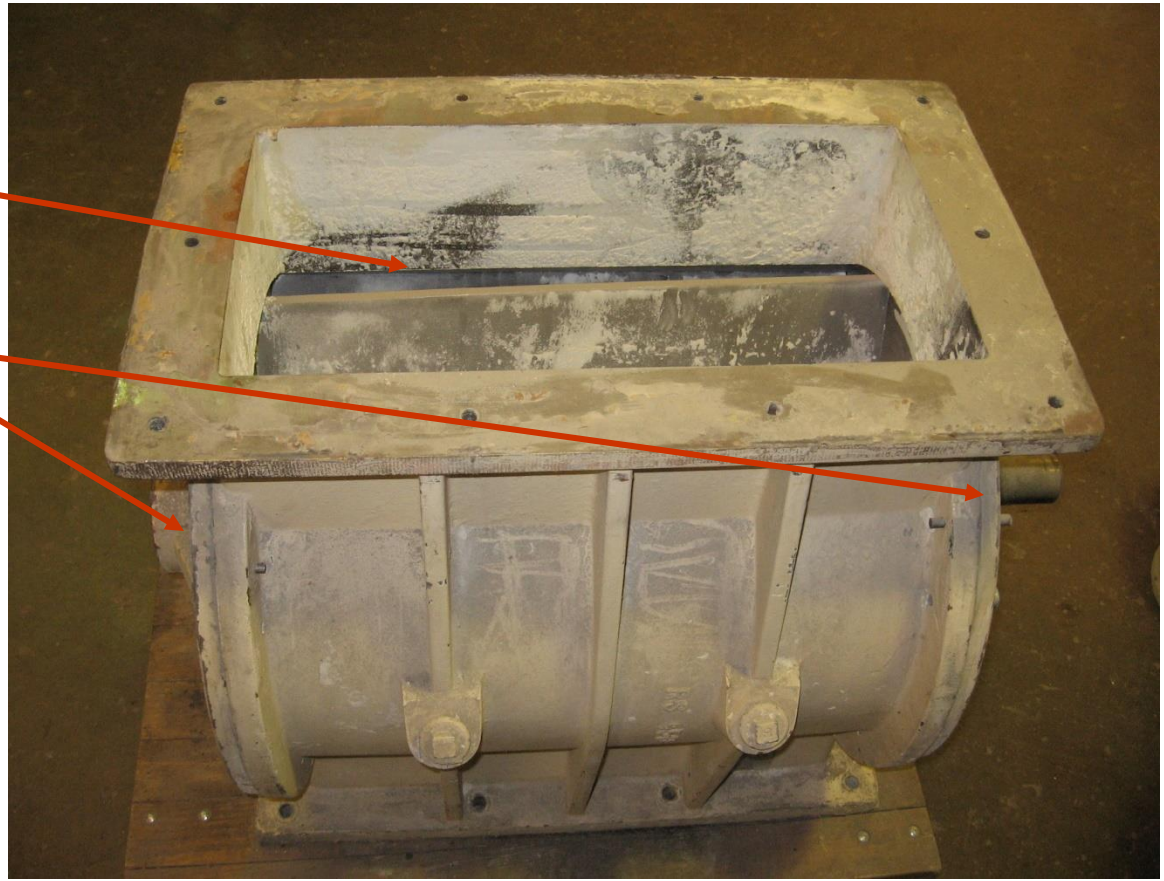


Product transfer blowers – motors, bearings, gearboxes

Rotary Air Locks
2 / 4 / 6 / 8 pockets

Shaft Support Bearings

Measures amount of product introduced into the airflow or production line



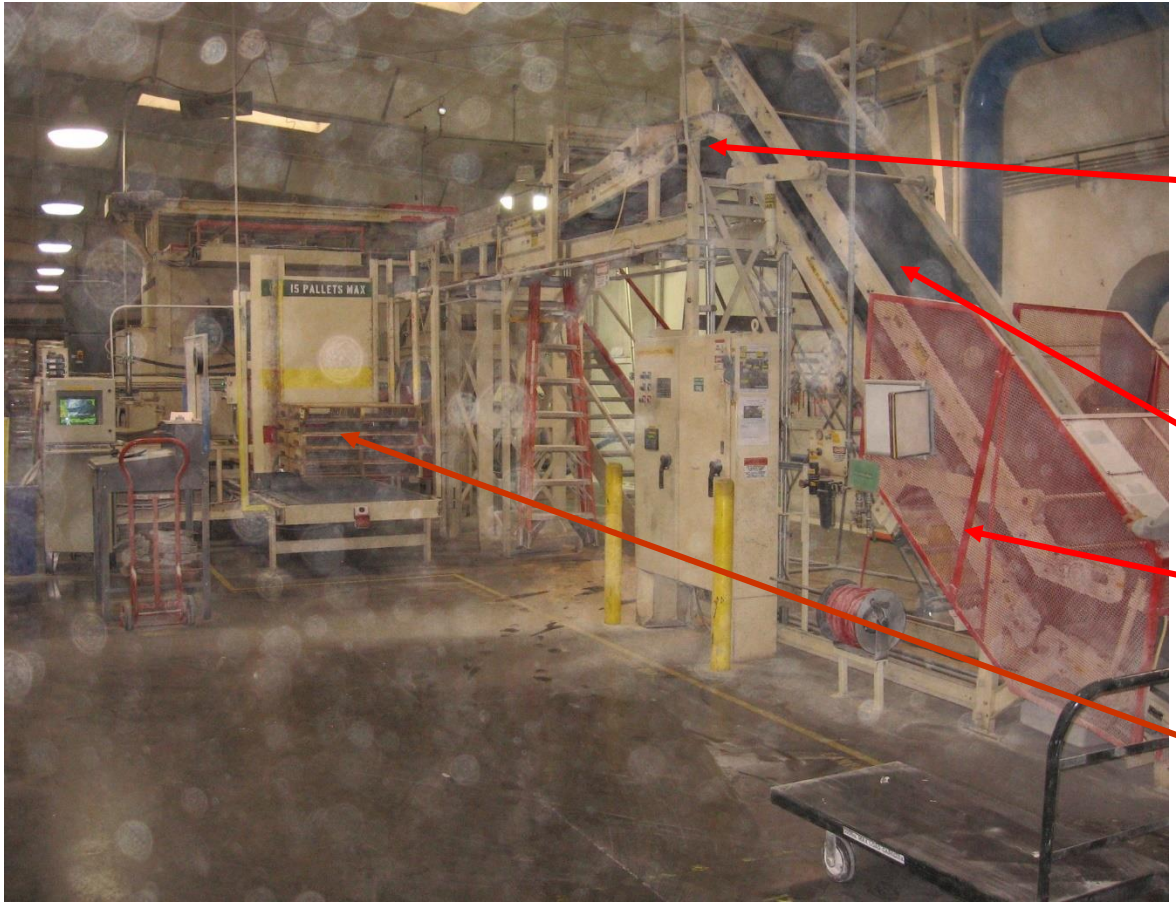
Single Point Lubricators on each support bearing
20 – 100 air locks

Bagging Area:

- ❑ Motors
- ❑ Gearboxes
- ❑ Bearings
- ❑ Belt or Chain Drives
- ❑ Conveyors
- ❑ etc…….

Bagging Area

Finished Product Conveying



Palletizing & Warehouse:

- ❑ Motors
- ❑ Belt or Chain Drives
- ❑ Gearboxes
- ❑ Bearings
- ❑ Chains
- ❑ Hydraulic Systems

Upper Belt or
Squeeze Belt
Lower Belt

Pallet Machines
- Wrappers
- Roller Conveyors
- Fork Lifts

Truck Load out Area
motors and bearings

Single Point Lubricators
as needed

Support Equipment: Yard Pup, Rail Car Spotter, portable compressor unit, generator

Cost of Lubrication – Manpower and Lubricants!

- 30 seconds to lubricate a grease fitting properly X the number of grease fittings?
- 30 minutes to drain and refill a small gearbox X the number of gearboxes?
- 4 hours to drain and refill large / leg gearbox X the number of gearboxes?
- 1 hour to drain / fill and grease forklift X the number of forklifts?
- ____ time to gather lubricants and supplies?
- Which and How much grease (NLGI) or oil (ISO) does the work order call for?
- How many hours does the Lubrication Engineer have to do the work?
- What support equipment is needed, additional manpower, etc.

Hydrotex SETTING CUSTOMER EXPECTATIONS
Your Lubrication Solution Partners®

Setting Customer Expectations

The three major goals of operations and maintenance are:

- Improve Output Capabilities
- Reduce Operating and Maintenance Costs
- Increase Profitability

Maintenance and overhead account for 65 % of facilities' expenditures and by adding utilities, the costs can soar to 84 %. Lubricants typically account for just 1 % of plant operating expenses, but they affect the whole operation. Utilizing the proper lubricants and Lubrication Management will reduce reactive maintenance and unplanned downtime.

Hydrotex® assists customers in identifying, developing and implementing continuous improvement processes in the fields of Preventive and Predictive Maintenance, Reliability and Facility Operations. We utilize on-site services, programs and training combined with superior high performance lubricants to meet our customers' expectations.

Hydrotex develops a unique plan for each customer. This plan is designed to provide the following services, programs and products based on the facilities' actual needs and goals:

- Equipment and Application Surveys
- Lubrication Audits
- Product and Solution Recommendations by Application
- Critical Equipment Identification and Tracking Program
- Cost Analysis, Return-On-Investment Processes and Equipment Energy Studies
- Implementation Plans, Time Tables and Process Management
- Training and Continuous Education Programs
- Oil and Fuel Analysis Programs
- Facility Equipment and Application Inspections
- Reporting Practices, Quarterly Reviews and Follow-up

The Hydrotex Team works closely with local and corporate contacts to develop a successful process. Our team includes the local Hydrotex Lubrication Consultant, area Division Partner and corporate Market Segment Leader. Every team member receives a minimum of 40 hours of training annually and is responsible for helping our customers meet their corporate goals.

Our products and solutions complement a proactive lubrication and maintenance approach and result in one lubrication supply source, consolidation of effort, optimized efficiencies and sustainable solutions.

What is a World Class
Lubrication Reliability Process?

How Does a World Class
Lubrication Reliability Process
Tie Into Maintenance Programs?

What is The Cost of A World Class
Lubrication Reliability Process
And Maintenance Program?

FACILITY LUBRICATION MANAGEMENT PROCESS: IMPLEMENTATION PROGRAM

Hydrotex
Your Lubrication Solution Partners®

Start Date	End Date	Description	Site	Facility Responsible Party	Hydrotex Responsible Party	Technical Responsible Pary	DP / LC Responsible Pary	Technical Partner Responsible Party
		Hydrotex Introduction & Planning Meeting	Facilty		Alan Harding	Kenny Foley	Mike Feltnor	
		Hydrotex Equipment & Application Suvey	Maintenance					
		Step 1 - equipment/application survey		Facility	Alan Harding	Kenny Foley	Mike Feltnor	
		select facilities/assign priority/survey process	Maintenance	Facility	Alan Harding		Mike Feltnor	
		PM Team and reporting process		Facility	Alan Harding		Mike Feltnor	
		initial information gathering		Facility	Alan Harding		Mike Feltnor	
		local facility drawings		Facility	Alan Harding		Mike Feltnor	
		local facility asset list		Facility	Alan Harding		Mike Feltnor	
		local facility equipment list		Facility	Alan Harding		Mike Feltnor	
		critical equipement identification		Facility	Alan Harding		Mike Feltnor	
		OEM information		Facility	Alan Harding		Mike Feltnor	
		review survey and update		Facility	Alan Harding		Mike Feltnor	
		Step 2 - equipment/application survey	Maintenance		Alan Harding		Mike Feltnor	
		confirm OEM lubricants		Facility	Alan Harding		Mike Feltnor	
		confirm equipment /application data		Facility	Alan Harding		Mike Feltnor	
		review survey and update		Facility	Alan Harding		Mike Feltnor	
		Step 3 - equipment/application survey	Maintenance		Alan Harding		Mike Feltnor	
		complete data collection/survey information		Facility	Alan Harding		Mike Feltnor	
		review survey and update		Facility	Alan Harding		Mike Feltnor	
		Lubrication Usage Tracking Program		Facility	Alan Harding		Mike Feltnor	
		Training - Principles of Lubrication			Alan Harding		Mike Feltnor	
		see training overview tab						
		Lubrication Crossover	Maintenance		Mike Feltnor			
		confirm OEM lubricants		Facility	Mike Feltnor			
		lubrication OEM audit		Facility	Alan Harding			
		Pricing Overview		Facility	Alan Harding		Mike Feltnor	
		Hydrotex Lubrication University	Dallas, TX		Alan Harding			
		Quarterly Course - notification by email by Hydrotex		Facility	Beverly Brunner			
		Facility attendee(s) selection		Facility				
		Maintenance attendee(s) selection		Facility				
		Color Code & Labeling	Maintenance	Facility	Mike Feltnor			
		order color code/label materials		Facility	Alan Harding			
		install color code/labels		Facility				
		Hydrotex HPN Order Process Orientation	Purchasing		Pam Gunter			
		Develop and Implement Facility Reliability Team	Maintenance	Facility	Alan Harding		Mike Feltnor	
		assign responsible personnel for lubrication program		Facility	Mike Feltnor			
		Gearing Temperature Tracking Program		Facility	Mike Feltnor			
		Critical Equipment Tracking Program		Facility	Mike Feltnor			

Lubrication Management Process | Action Planner | Training Overview | Project Management

Lubrication Management Process
Action Planner

History

Next Item#: 27

Project Name: XYZ Customer

Project Start Date:

% To History: 0%

Item #	Priority	Area	Action Item	Start Date	Original Due Date	Current Due Date	Point Person	Status	Comments
1		XYZ Customer - Management Team	Introduction of Hydrotex Lubrication Management Process				Plant Manager		Discuss Lubrication Management Process
2		XYZ Maintenance and Operations	Review Plant operation - walk trhough				Maintenance Manager		Reviewed production equipment. Looked at blower operation, ovens,
3		XYZ Maintenance and Purchasing	Obtain current lubrication list and usage rates				Maintenance Manager		Reviewed lubrication storage area and collected current lubrication infromation. Obtain usage rates per
4		Hydrotex Lubrication Management Process	Provide Hydrotex Lubriction Implementation Plan as example and as planning tool.				Alan Harding		Send Implementation Plan. Develop plant plan with Maintenance Manager
5		Hydrotex Lubrication Management Process	Provide Temperature Tracking Program Critical Equipment- Example				Alan Harding		Send Temperature Tracking Example - Blowers
6		Hydrotex Lubrication Management Process	Action Planner				Alan Harding		Provide Plant Action Planner
7		Hydrotex Lubrication Management Process	Provide Lubricant Crossover Survey				Alan Harding Techncial Services		Cross over current lubricants to Hydrotex recommended lubricants. Confirm OEM lubricant recommendations on Criitical Equipment
8		XYZ Customer - Operations and Maintenance	Determine Critical Equipment				Alan Harding		List Critical Equipment for tracking and Oil Analysis Program
9		Hydrotex Lubrication Management Process	Visit plant, temperature review, Critical Equipment, etc.				Alan Harding		Set appointment with Paul DeLao and develop temperature tracking, blowers, ovens, other critical
10		Hydrauic Systems	Use oil samples to determine fluid cleanliness of each system. Flush and Fill ?				Hydraulic Technican		Samples provided to Polaris
11		Equipment Review and Inspection	Hydrotex to visit plant and reivew equipment applications				Alan Harding		Visit to plant schedulted May 12th 2011
12		Lubrication Reliability Team	Develop LRT - Maintenance Manager, Lead Mechanic, Operations and Engineering, Hydrotex				Maintenance Manager		Assign key personnel to Lubrication Reliability Team

Hydrotex Technical Response Team:

- 50 Years of Experience
- Society of Tribologist & Lubrication Engineers - STLE
- Society of Maintenance Professionals – SMRP
- Return-on-Investment and Energy Studies
- Facility Survey Process
- Lubrication and Application Recommendations
- Technical Issues and Concerns
- Root Cause Failure Analysis
- Lubrication and Application Training Programs
- Facility Specific Training Programs

Hydrotex Lubrication University:

- 3 Day Intensive Lubrication School on a Quarterly Basis
- On-Site Principles of Lubrication Class
- Customer Professional Development Internet Courses
- Application Specific Lubrication Courses
- Facility Specific Lubrication Courses
- Internet – Live Instructor / Application or Skill Specific Courses

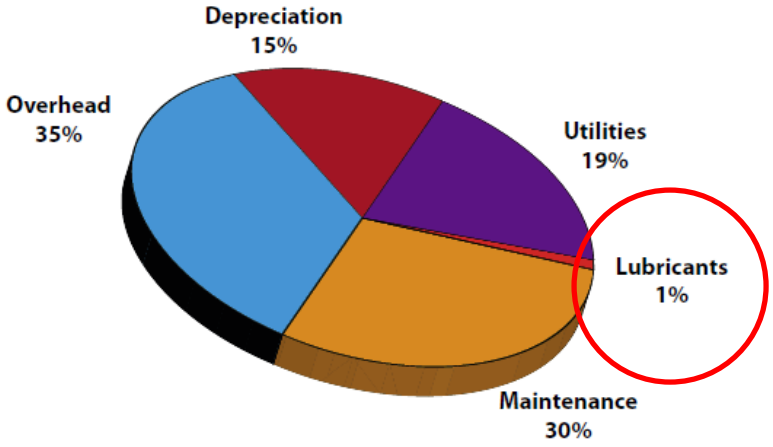
Hydrotex Lubrication University and Courses are approved to meet:

- Recertification for International Council for Machine Lubrication / MLA I, II, and MLT I, II and III
- Recertification for SMRP
- Recertification for STLE
- CEU – Continuing Education Credits

The Bottom Line Impact of Lubrication

Industrial Lubricants Typically Account for just 1% of Plant Operating Costs

Reduce Costs
Increase the R.O.I.
10%
30%
40%
?



The proper selection and application of lubricants will improve overall profitability.

- **Utilities:** Proper lubrication can reduce energy usage over 10%.
- **Maintenance:** Over 30% reduction in maintenance expense can be achieved with proper lubrication and Lubrication Management.
- **Overhead:** Reduce spare parts inventory and labor costs with extended maintenance intervals.
- **Depreciation:** Equipment lasts longer and improves ROI.

Alan Harding
aharding@hydrotexlube.com
972-389-8500

Lubrication Management Process

*There are Several Types of Hydrotex® Surveys