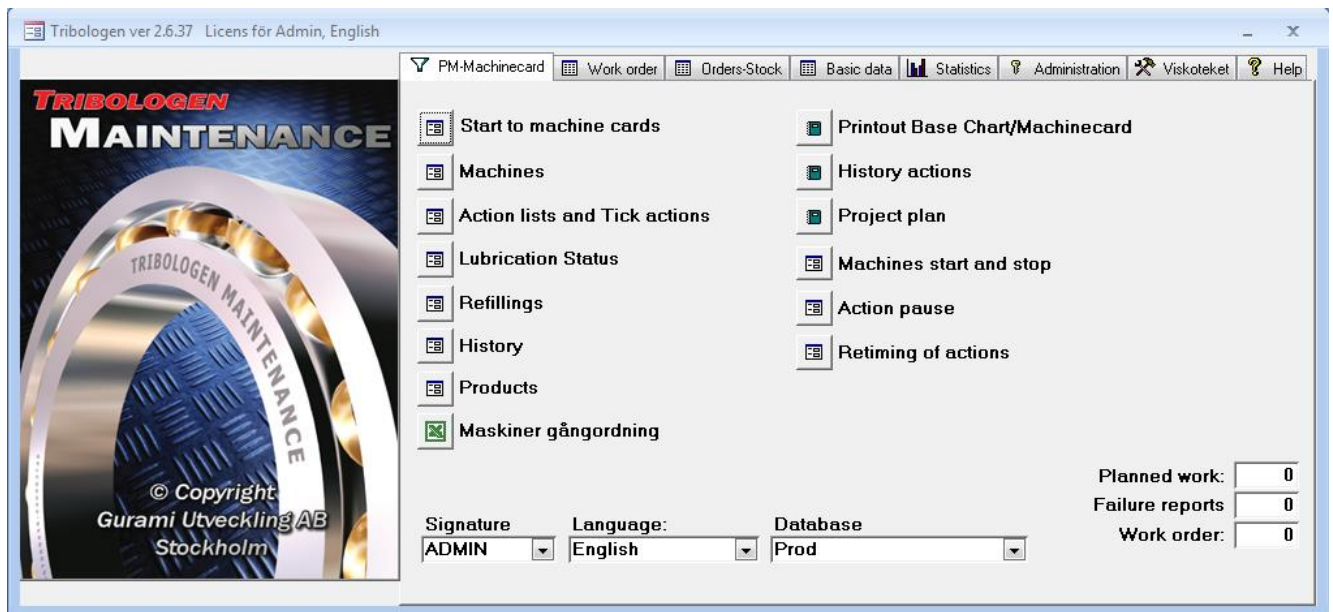


TRIBOLOGEN MAINTENANCE

Tribologen is a maintenance program for the handling and management of all preventive and corrective maintenance. The program has been specially created for the maintenance department's need of a simple and useful tool.

A mid-sized company has several thousand service points to maintain. The base is the machine producers recommendations for service and maintenance. The crew are responsible for all of the service points being completed in the right way, at the right time, at the right place, with the right equipment and the right type of products - a very complex task.

Additional responsibilities are production and quality demands, guarantee questions, production certifications, inspections, standards and environmental demands. (ISO 9000, ISO 14000, EMAS, GMP, FDA/USDA/NSF, Haccp).



Those who have tried inputting lubricant and preventive maintenance points in conventional maintenance systems, find them not adapted for maintenance demands. Most maintenance systems are based on accounting systems and are often too complex for use on the plant floor. Also, the important functions and reports that the maintenance crew needs to complete their work in a rational way are often missing.

Tribologen is a tool for full control over what has been done and what needs to be done.

Small to mid-sized companies can use the program as a complete maintenance system for handling of all preventive maintenance, corrective maintenance, work orders and purchases/inventory.

Big companies, who already have a maintenance system, use Tribologen as a complementary preventive maintenance and rounding module for lubrication and other practical maintenance.

The system is driven fully by those who perform the practical work.

The system has simple and good functions to make the program very user friendly and time effective. Less emphasis has been placed on the economic functions, however time, parts and lubricant consumption is recorded and tracked.

Each and every person in maintenance and in the workshop can use the system fully after just one hour of instruction, even for those employees who are not used to working with computers.

Technical Data: Tribologen is developed in Visual Basic Applications (VBA) and as a standard uses MS Access or SQL-servers as database managers. The program can be used both for single use and in a client-server installation.

Tribologen Maintenance is a tool for maintenance departments in need of a systemized preventive maintenance system. A system everyone can quickly start to use.

Machine Card

All the service and maintenance points for a machine can be seen collectively on a Machine Card. The Machine Card is the base for all information handling and for all different types of lists and reports created.

Department LINJE 1 (Demoexempel)

Machine SPIRALTRANSPORTÖR (Demoexempel)

Tab Page Domestic no

Manufacturer

Move Type specification

2011-01-05 Hydraulpump missjud? Kollas.

2010-05-10 Alla intervaller har kortats pga av drift tid som numera ökat till den

2006-08-21 Ny plastkedja monterad pga förlängningen


2005-08-05 Ny våg monterad vid utmatnings sida

2004-01-05 Genomgång med städpersonal gällande nya rutiner för spiraltransportör

2004-09-20 Maskinstativ ommålat (international 208 tvåkomponent)

2003-05-08 Oljeanalys hydraulolja CSM i Linköping - Vatten i olja 0,28 % Se ar

2002-09-18 Missjud vid drivstation bandtransportör.



Copy

Performer

Smörjstatus

6 Documents

Machine card

7 Pictures

History PM

Machinepoint	Resp.	Volum	Count	Method	Product	Lubrication	Checking	Change	Note
Centralsmörjning	OP	50	1	Behållare	OMALA 100	1 V	L	C	Kontroll av nivå och funktion
Dimsmörjare	OP	0,25	1	Behållare	TELLUS 32	1 V	L	C	
Kedjor	FU	1	3	Spray	OMALA 100	3 Mån	L	C	Kontroll slitage
Lager elmotor	FU	28	2	Fettspruta	ALVANIA EP 2	3 Mån	L	C	Kontroll temp - max 60 C = ok
Trumman övre och nedre lager	FU	48	2	Fettspruta	ALVANIA EP 2	3 Mån	L	C	
Analys hydraulolja	FU	0	1	Oljeanalys	TELLUS 32	1 År	L	C	Sug Vampire finns i oljebod
Duplex patroner onlinefilter	FU	0	2	Patronbyte	HF 6510	1 År	L	C	
Rengör elmotorer från damm	FU	0	3	Tryckluft	TRYCKLUFT	1 År	L	C	Alt dammsugning
Drivväxlar	FU	13,5	3	Båd	OMALA 220	3 Mån	L	C	12 mm nyckel till lucka
Filteratron hydraulolja offlinefiltrering	FU		3	Patronbyte	EUROPAFILTER	3 Mån	L	C	Kontroll av mottryck
Hydraulaggregat	FU	175	1	Behållare	TELLUS 32	3 Mån	L	C	Kontrollera ev läckage
		0	0				L	C	

Refills

Date	Amount	Unit
2006-10-26	18	liter
2006-09-19	10	liter
2006-08-17	8	liter
2006-08-15	12	liter

In the example above, the text highlighted in red is for the items on the Machine Card that should be performed this week or haven't been done earlier. The red items are also highlighted on the printed Weekly List. When the Weekly List has been checked off, all items are logged on the Machine Cards preventive maintenance history.

In the "responsible" field you can select the function to perform the maintenance (operator, maintenance, lubrication, electrical, mechanical).

You can create different Weekly Lists with tasks for groups. Another alternative is to create a common Weekly List for all groups.

Week list

Plant: FACTORY 1 BUILDING 21 (demoex)

Department: LINE 1 (demoexample)

Product: *

Resp.: Maintenance workshop

Page	Machine	Action	Volume	Count	Product cod.	Method	Time	Signatur	Note
1	1 SPIRALTRANSPORTER (demoexample)								
	2006-10-09 Rollerbearing topp bearing	Lubricatio	18	2	Ceran FG	Grease gun	0		Cleanliness
	2006-10-09 Belt drive	Checking	0	2	Belt 445	Control	0		
	2006-10-09 Belt drive	Change	0	2	Belt 445	Control	0		
							Total time:	0	
1	2 ALPINA FILLER								
	2006-10-23 Hydraulic	Checking	60	1	Tellus 68	Reservoir	0		
	2006-10-23 Gear	Checking	5	1	Omala 220	Bath	0		
	2006-10-23 Gear	Change	5	1	Omala 220	Bath	0		
							Total time:	0	
1	3 NAUTA MIXER								
	2006-10-23 Fittings	Lubricatio	15	3	Ceran FG	Grease gun	0		
	2006-10-23 Gear	Checking	10	1	Omala 220	Bath	0		
							Total time:	0	

Total time department: 0,0

History

Plant: FACTORY 1 BUILDING 21 (demoexa) **TRIBOLOGEN**

Department: LINE 1 (demoexample)

Machine: SPIRALTRANSPORTER (demoexamp)

Internalnr: 98008

Machinepoint	Action	Note	Date	Performer
Air mist lubricator	Produktbyte	Tellus 32 -> SFGO 32	2006-10-23	LM
Air mist lubricator	Smörjning	1 W	2006-10-23	CK
Hydraulic	Byte	3 Y	2006-10-23	RW
Gearbox - bevelgear	Byte	3 M	2006-10-23	RW
Hydraulic	Kontroll	1 M	2006-10-23	RW
Rollerbearing topp bearing	Produktbyte	Alvania 2 -> SFGO 32	2006-10-23	LM

Plant: FACTORY 1 BUILDING 21 (demoexample) **TRIBOLOGEN**

Department: LINE 1 (demoexample)

Internalnr: 98008

Manufacturer: ATRIX comp

Type spec: 444675

SPIRALTRANSPORTER (demoexample)	Resp.	Vol	Cnt	Method	Product	Lubricate	Checking	Change	Note
Plainbearing	OP	0	4	Handöler	Tellus 68	Sm = 1 V			
Air mist lubricator	OP	0,3	1	Oil level	SFGO 32	Sm = 1 V			Only NSF H-1
Rollerbearing topp bearing	Maint	18	2	Grease gun	Ceran FG	Sm = 3 M			Cleanliness
Hydraulic	Maint	250	1	Bath	Tellus 68		Ko = 1 M	By = 3 Å	Check leakage
Contactar	Elect	0	1	Check	R.9979q2		Ko = 3 M	By = 1 Å	
Gearbox - bevelgear	Maint	10	1	Bath	Omala 220		Ko = 3 M	By = 3 M	Tool 16 mm
Belt drive	Maint	0	2	Control	Belt 445		Ko = 3 M	By = 3 Å	
Hydraulic filter	Maint	0	2	Replace	MANI 6677		Ko = 3 M	By = 1 Å	Tool 24 mm

Weekly List for checking and printing

Maintenance for Operators (MFO)

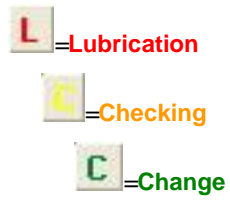
Maintenance points can be divided between machine operators and the workshop, which is often done at the introduction of TPM/TPU maintenance. The yellow rows on the Machine Card clearly shows which points the machine operator is responsible for. This card can be laminated and posted by the machine.

Intelligent checklist

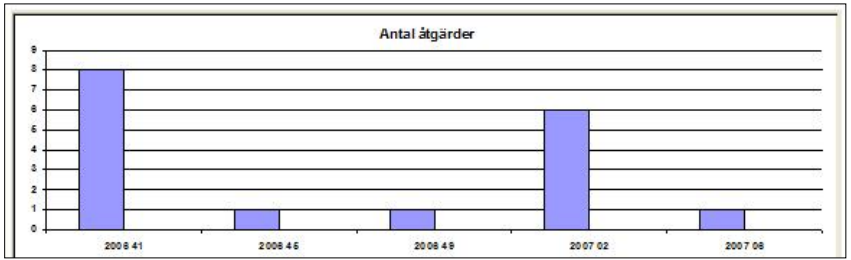
You can quickly and easily check off your points in the weekly list regardless of if you have completed, for example, ninety, fifty or fifteen percent of the maintenance points and this "checking off" only takes a few minutes.

2/4

Buttons for checking off



Operativ	Department	Machine	Machinepoint	Product	Lubrication	Checking	Change	Fail	Later
LINE 1 (demoexample)		SPIRALTRANSPORTER (demoexample)	Rollerbearing topp bearing	Ceran FG	3 M	L		F	>
LINE 1 (demoexample)		SPIRALTRANSPORTER (demoexample)	Belt drive	Belt 445	L	3 M	3 Y	C	F
LINE 1 (demoexample)		ALPINA FILLER	Hydraulic	Tellus 68	L	1 M	1 Y	C	F
LINE 1 (demoexample)		ALPINA FILLER	Gear	Omala 220	L	3 M	3 M	C	F
LINE 1 (demoexample)		NAUTA MIXER	Fittings	Ceran FG	1 M	L		C	F
LINE 1 (demoexample)		NAUTA MIXER	Gear	Omala 220	L	3 M	2 Y	C	F



The volume of work can be tracked week by week in the project plan.

Error reporting and work order handling

Error reporting is normally done on the Machine Card, which as the next step is turned into a work order. The work order is printed out, performed and recorded as performed. All work orders performed are collected on respective Machine Card under Work Order History.

Purchases and inventory handling

You can easily and quickly order goods by printing out a Purchase order or a Direct purchase order. All purchases are registered and saved automatically. You can register incoming and outgoing goods in your inventory and plan your future orders. Spare parts by machine type can be looked up in "Spare Parts by Machine."

Work Order Detail

Worn: 1 Status: Beredning Internallnr: 96008
 Machine: SPIRALTRANSPORTER (demoexample) Machinepoint: Hydraulic
 Plant: FACTORY 1 BUILDING 21 (demoexample) Department: LINE 1 (demoexample)

Failure report: Sounds strange - pump failure ?
 Failure date: 2006-09-22 FailureSign: LM
 Category: []

Preparation: Planned: 2006-11-25 Change pump imm
 Priority: []
 Performer: RB
 Resp: Mech
 Worktype: Corr maint

Product code	Product type	Product name	Description
Tellus 32	Oil	Shell Tellus 32	
Fleetguard M8	Filter	Fleetguard M8	

Reporting: Started: 2006-10-25 Finished: 2006-10-26
 Signature: RB Required time: 120

Buttons: Prep. Finished, Action started, Action performed, Purchase order, Machine card, Print, Ca

Failure report

Worn	Machinepoint	Failure text	Signature
1	Hydraulic	Sounds strange - pump failure ?	LM 2006-09-22
2	Hydraulic	Slip	BS 2006-09-22

Count	Name of machine	Department	Plant
4	SPIRALTRANSPORTER (demoexample)	LINE 1 (demoexample)	FACTORY 1 BUILDING 21
1	MIXER 2	LINE 1	FACTORY 2 BUILDING 22
1	MIXER 1	LINE 1	FACTORY 2 BUILDING 22
1	ATLAS COPCO GA 708 nr 1	ATLAS COPCO	AIR COMPRESSORS
1	NAUTA MIXER	LINE 1 (demoexample)	FACTORY 1 BUILDING 21
1	ALPINA FILLER	LINE 1 (demoexample)	FACTORY 1 BUILDING 21

Ready to go

To input actual service points to machine applications is easily done in Tribologen thanks to the smart help functions. If you need more help with the setup of Tribologen Maintenance, we have a special startup package that we call "Ready to go". We build the hierarchy for applications together. We then make an inventory of the maintenance needs on the machines and their purpose and input the information into Tribologen Maintenance. Then we print your first Weekly List for maintenance.

Tribologen Maintenance was created after several studies showed that the more complex a maintenance program is, the less it is used by the crews performing the maintenance.

Tribologen Maintenance includes:

Building from the ground up

- The hierarchy with view of three or four levels (plant, units, departments, machines)
- Machine register with one Machine Card for each machine
- Multiple databases, for the use with several companies

Machine Card

- All maintenance for one machine on one Machine Card
- Preventive maintenance history
- Error reporting plus corrective maintenance report history
- Quick functions to Change machines, Copy machine and Pause machine
- Document and Detail picture
- Responsibility - delegation of responsibility for each machine point (i.e. corrective, preventive)
- Maintenance for Operators (MFO), printing of card showing maintenance to be performed by the operator
- Registration of performed filling of machine points and grease volumes

Purchasing and Inventory

- Purchase orders or Direct purchase orders
- Products and spare parts in inventory (quantity, ordering schedule, storage place, department use)
- Suppliers listed
- Spare parts used by machine type
- Products used by unit
- Product information register (includes Product sheet, Goods information and H-1 certificate)

Weekly list/ Preventive Maintenance

- Weekly list/rounds with intelligent check lists
- Trail list with intelligent check lists
- Preventive Maintenance History

Corrective Maintenance

- Error reporting (with drop down help functions for foreigners)
- Categorization of error reports in Acute corrective maintenance, Delayed maintenance , Improvement etc.
- Planned work by department
- Work order and preparation
- Work Order History
- Number of problems per machine (top ten lists)

Help tools and Quick functions

- Start-Stop, shows when a machine or department is still or in use
- Product Occurrence, shows which machine needs a certain product (ie a filter)
- Product Change, changes a product in the whole maintenance program, on all machines
- Project Plan with future workload in the system (diagrams and detailed lists)
- Consumption plan, which products and how much will be used during a set future period of time
- Maintenance Stop (both on machines and units)
- Adjustments of maintenance schedules
- Machine model register (machine types are registered for easy use)
- Compilation of filled volumes of oil and chemicals (top ten list)
- Print out of the complete maintenance book for the whole plant (includes: department register with file and page number; Product register and their use; all Machine Cards)
- Language (English and Swedish versions)
- TAK/OEE indicator modules as an extra option
- ASSALUB:s computerized verifying lubrication system "LUBRIGHT" implemented from juli 2007

Viskoteket Dimensioning Tool

- Interval settings for bearings, gear and hydraulic systems according to time in use and environment
- Selection of correct amount of grease for bearings
- Selection of correct and optimal viscosity for bearings and gears
- Error detection for bearings, gear boxes and hydraulic systems
- Triboloxikon – a reference book for conversions, calculations, mixtures etc.
- Viskoteket is included in Tribologen Maintenance or can be ordered as separately.



Gurami Utveckling AB
Skogklockevägen 15
181 57 Lidingö, Sweden

Richard Wolffelt
www.tribologen.se
+46 (0) 734 34 54 24