

Eplicor 离散制造业

MES 解决方案

宋国宣
Eplicor 解决方案经理



关于 Epicor

成立时间	1972	雇员	~4,000
年营业收入	\$9.5亿+	合作伙伴	400+
业务区域	150国家	客户	20,000+
中国总部	上海	技术中心	广州

Mattec MES® 始于**1983**年，专注行业**30**年

版本



..

截止**2012**年底，**MES**全球客户超过**800**家

Epicor MES 帮助您…

- 不加设备，**增加产能**
 - 发现并降低非计划停机时间
 - 使用这些能力生产更多产品或削减成本
- **提高良品率 / 降低报废率**
 - 关注质量损失点
- **提高产品的 生产能力**
 - 关注你的速度损失及周期时间损失点
- **提高 OEE (全局设备效率)**
- **所有工厂采用一致的 OEE 衡量标准**
- **高级 SPC/SQC 模块助力 OEE 更大改善**
- **工厂/集团级分析**

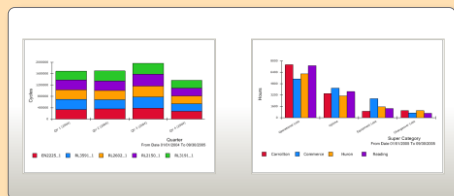
工厂级管理

车间



集团级管理

集团分析



iPad APP



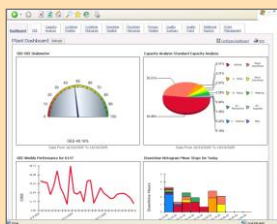
MES 方法

ERP

MES



工厂分析



生产线

MIU



OPC CONNECTOR



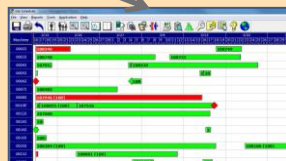
生产线



操作员端



实时动态排程



能源监控

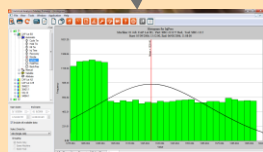


实时显示



工厂操作

SPC/SQC



对于操作员…

使用触摸技术的MIU (Machine Interface Unit)



或

PC MIU



输入报废原因及数量

PCMIU (01)

Process Alarm Login **Scrap Entry** Down Time Call For Help Extended Functions 01

01/30/2012 Scrap Entry 09:43

Job Number CAP Lot B3 - SBC-221277 Red Units Parts

Flash 0

Flash SHOR 1 2 3 Clear 起泡

Color Warp 4 5 6 Cancel Dimen

Gas 7 8 9 Enter

- 0 .

Scrap Entry Report Shift Pareto Job Pareto Print Packed

查看报废报表

PCMIU (01)

Process Alarm Login Scrap Entry Down Time Call For Help Extended Functions 01

01/25/2012 Scrap Entry 10:07

Scrap Reason	Amount (Shift)	Amount (Job)
Shrink	4147	4147
Contomin	652	873
??	51	357
Splay	170	325
Warp	0	210
Scratch	6	156
Short	88	150
Void	68	88
Flash	73	73
Sink	0	70
Color	0	65
Dimen	0	0
Gas	0	0

Scrap Entry

PCMIU (01)

Process Alarm Login Scrap Entry Down Time Call For Help Extended Functions 01

01/25/2012 Scrap Entry 10:07

Scrap Pareto (Shift)

Shift: 01, Job: CAP Lot B3, Part: SBC-221277 Red, Tool: SBC-1115, Shift: 06/08/2006, Sh

Scrap Reason	Amount (Shift)	Cumulative %
Shrink	4147	79%
Contomin	652	91%
Splay	170	95%
Short	88	96%
Flash	73	98%
Void	68	99%
??	51	100%
Scratch	6	100%
Color	0	100%
Warp	0	100%
Sink	0	100%
Dimen	0	100%
Gas	0	100%

Scrap Entry Report Shift Pareto Job Pareto Print Packed

输入停机原因

PCMIU (01)

Process Alarm Login Scrap Entry Down Time Call For Help Extended Functions 01

01/25/2012 Downtime Selection 10:09

None No Op Idle **Material** Mach PM Tool PM QC Water Oil Leak 预热

PM Aux

Job Number CAP Lot B3 - SBC-221 Down Time Reason Material

Part Number SBC-221277 Red

Acknowledge Voice

Reason	Shift		Job	
	Hours	Count	Hours	Count

Navigation icons: Up, Down, Print, Calendar, Bar Chart

寻求帮助

The screenshot shows a software window titled "PCMIU (01)". The interface features a top navigation bar with several icons: a warning sign for "Process Alarm", a person with a clock for "Login", a recycling symbol for "Scrap Entry", a red X for "Down Time", a question mark in a speech bubble for "Call For Help" (which is highlighted with a blue dashed border), a list icon for "Extended Functions", and a factory icon for "01".

Below the navigation bar, a yellow header bar displays the date "01/25/2012", the title "Call For Help", and the time "10:11".

The main content area contains a grid of buttons for requesting assistance:

Cancel	Supervisor	Maintenance	Relief Oper	Parts Pickup
模具維修	QC	Material	Foreman	

操作员还能做...

The screenshot displays the PCMIU (01) operator interface. The central window shows a 'Process Alarm' screen for 'CAP Lot B3 - SBC-221277 Red'. The status is 'Running OK'. Key data points include: Good Prod. 2953, Run Time 4:15, Scrap Prod. 5255, Down Time 0:00, and Prod. To Go 689579. A table of process parameters is shown below, with columns for Parameter, Last Value, LSL, Nominal, USL, X-LCL, X-Bar, and X-UCL.

Parameter	Last Value	LSL	Nominal	USL	X-LCL	X-Bar	X-UCL
Cycle Tm	24.0	20.0	24.2	26.0	24.0	24.0	24.0
Hold Tm	5.9	5.5	6.0	6.5	5.7	6.1	6.5
Fill Tm	2.1	2.0	2.5	3.0	2.2	2.6	3.0
Inj Time	7.7	7.5	7.8	7.9	7.6	7.8	7.9
Recovery	6.6	6.0	7.0	8.0	6.4	7.2	7.9
Nozzle	44.07	44.00	45.00	46.00	44.40	45.17	45.94
InjPres	1289.2	1275.0	1300.0	1400.0	1276.2	1331.1	1386.0
HoldPres	813.5	800.0	875.0	900.0	832.9	870.6	908.3
BackPres	428.6	415.0	435.0	450.0	422.9	436.8	450.7

Surrounding windows show additional interface elements: a 'Process Alarm' indicator, a date of '01/25/2012', a 'Machine Number' field, a 'Total Prod.' field, a 'Cycle Tm' dropdown menu with limits (High: 26.0, Low: 20.0, Standard: 24.2), and a 'Hold Tm' dropdown menu with limits (High: 6.5, Low: 5.5, Standard: 6.0) and a statistical summary table.

Statistic	Value
Minimum	5.51
Maximum	6.50
Mean	6.08
Median	6.12
Mode	6.50
Standard	0.00

Real-Time Display (Mattec MES® Server) - [Real-Time Display]

File View Application Help

Machine Status

Machine Number: 01

Job Number: CAP Lot B3 - Shampoo Bottle Cap

Part Number: SBC-221277 Red

Tool Number: SBC-1115

Customer: Calmar

Machine Number: 01, 1,000 Ton Last Update: 06/08/2006, 8:14:56

Job Number: CAP Lot B3 - Shampoo Bottle Cap

Part Number: SBC-221277 Red, Red Bottle Cap Forecasted End: 02/24/2012, 16:40

Tool Number: SBC-1115, Shampoo Bottle Cap Tear-Down Time: 0:00

Customer: Calmar

Overview | Process Alarm | Material | Setup Sheets | Next Job

Production

	Shift	Job	To Go
Total Production :	8208	1366935	692881
Good Production :	2953	1360421	689579
Scrap Production :	5255	6514	
Packed Production :	8100	1379100	670900
Machine Cycles :	684	122305	
Setup Cycles :	0	45	
Non-Production Cycles :	0	0	
Cycles Out-Of-Spec :	0	158	
Run Time :	4:15	568:32	535:04
Down Time :	0:00	38:31	
Down Count :	0	7	
Part Qualification :	0	0	

Machine Status

Status: Running OK.

Time In Status: 66:52

Help Call:

Help Start Time:

Efficiency

	Shift	Job
Cycle Efficiency :	105.4%	105.7%
Yield Efficiency :	37.8%	121.9%

Cavities: 12 Std 8 Act

Last Cycle Time: 24.0000 Seconds

OK Refresh Options Select Down Calc. Limits Voice/Email

远程监控



基于WEB

Browser: http://localhost/prohelp/realtime/

Navigation: All Machines | Out-of-Spec | Any Down Reason | Any Help Call | Refresh

Machine Number	S H	Job Number	H P	Good Production	Good Prod To Go	Hours To Go	Standard Speed	Actual Speed	Yield Eff	STD CAV	ACT CAV
AUTOMOTIVE - AUTOMOTIVE MANUFACTURING											
01	1	CAP Lot B3		2953	6895						
02	1	S1-0609		162	175						
02	1	S2-0609		244	50						
02	1	S3-0609		976	101						
02	1	S4-0609		244	49						
03	1	S1-0215		244	57						
03	1	S2-0215		256	57						
03	1	S3-0215		256	57						
ASM-M1	1	AssemD1-234		100	999						
AUTO-1	1	SOU112-B	*	501	155						
AUTO-2	1	MANIFOLD-0123	*	1466	135						
AUTO-3	1	CAP Lot A978	*	501	489						
AUTO-4	1	30760.42B	* 5	2659	47						
AUTO-5	1	321-0986B		13383	182						

iPad 5:23 PM 94%

Navigation: All Machines | Out-of-Spec | Any Down Reason | Any Help Call | Refresh

Machine Number	S H	Job Number	H P	Good Production	Good Prod To Go	Hours To Go	Standard Speed	Actual Speed	Yield Eff	STD CAV	ACT CAV
AUTOMOTIVE - AUTOMOTIVE MANUFACTURING											
01	1	CAP Lot B3		2953	689579	535:04	23.50	24.0	37.8 %	12	8
02	1	S1-0609		162	175573	2265:24	58.60	59.7	65.9 %	1	1
02	1	S2-0609		244	50284	767:29	58.60	59.7	116.7 %	1	1
02	1	S3-0609		976	101349	625:32	59.20	59.7	97.0 %	4	2
02	1	S4-0609		244	49414	634:22	61.00	59.7	98.0 %	1	1
03	1	S1-0215		244	57682	379:58	60.00	60.00	81.3 %	2	2
03	1	S2-0215		256	57604	758:15	60.00	60.00	105.3 %	1	1
03	1	S3-0215		256	57604	758:15	60.00	60.00	105.3 %	1	1
ASM-M1	1	AssemD1-234		100	999900	10194:01	30.00		76.6 %	1	1
AUTO-1	1	SOU112-B	*	501	155819	135:45	5.00	10.00	83.5 %	6	2
AUTO-2	1	MANIFOLD-0123	*	1466	135803	220:53	12.00	11.88	97.7 %	2	2
AUTO-3	1	CAP Lot A978	*	501	489788	347:16	3.30	0.00	11.2 %	1	1
AUTO-4	1	30760.42B	* 5	2659	47587	139:29	10.00	10.66	104.5 %	1	1
AUTO-5	1	321-0986B		13383	182142	536:14	10.00	11.26	83.1 %	1	1
EXT-15	1	32616.56	*	129.0	3321309.0	1215:16	15.00	100.00	0.2 %	4	4
EXT-16	1	洗发塑料瓶盖A19型	*	1466	4401106	114:20	1.40	10.50	97.7 %	20	19
NORTH3	1	B-0850	*	4008	108472	76:27	20.10	20.6	100.0 %	8	8
STAMP1	2	AG7 Lot 3		36	65758	153:11	7.00	7.58	122.5 %	1.000	1.000
BLOW - BLOW MOLDING & FILM											
BLOW1	1	WR-0210		2306	59197	176:26	8.00	11.8	96.6 %	1	1
BLOW2	1	B-1514		2459	467545	1512:18	10.00	10.2	103.1 %	1	1

图形化车间布局图显示



生产看板 - 白板

RealTimeDisplay - [白板]

文件(F) 查看(v) 应用程序(A) 帮助(H)

部门: Automotive - Automotive Manufacturing

部门: 所有部门

部门	OEE	周期效率	生产效率	平均周期	报废 %	停工率
Automotive	96.1 %	79.1 %	29.7 %	19.37	15.8 %	13.2 %

OEE: 96.1% (Green bar)

周期效率: 79.1% (Red LED display)

96.1

机器	时间	描述
EXT-15	0:00	Unknown / In Prod
AUTO-1	0:01	Mach Maintenance
AUTO-3	0:01	Material Problem

设备01 13:40计划性停机

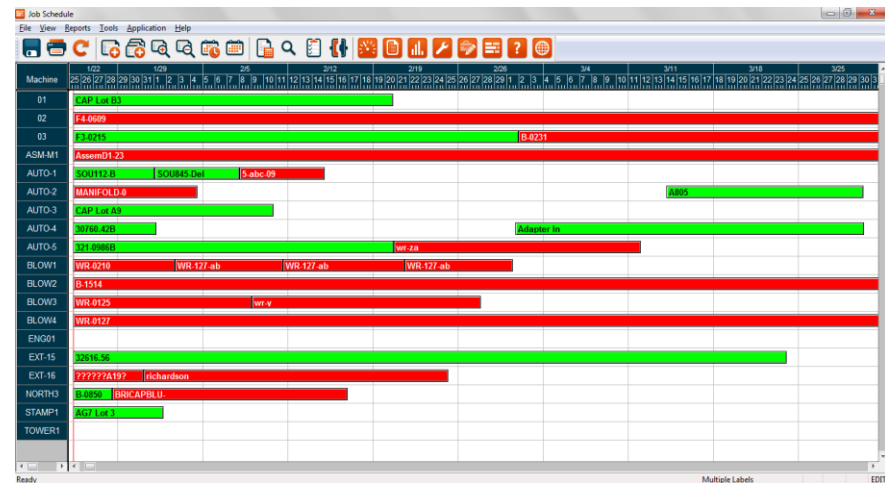
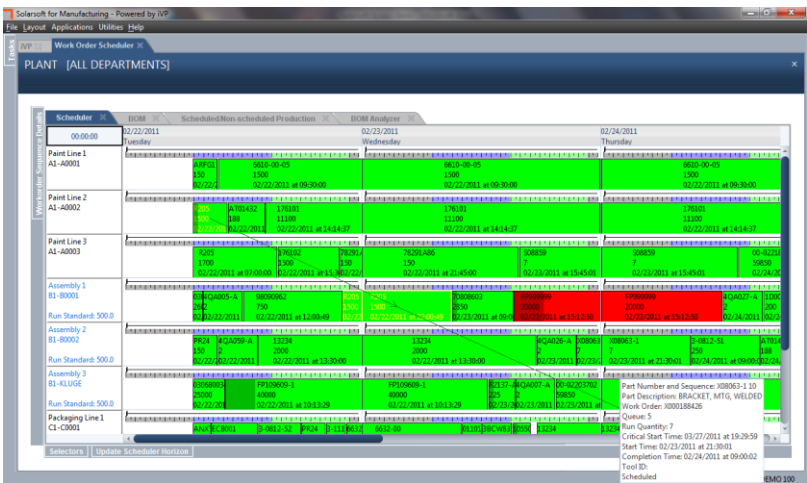
实时显示 车间 白板

一体化的企业



ERP

MES



1

2

运行 MRP 生成生产计划

作业排程并且运行

4

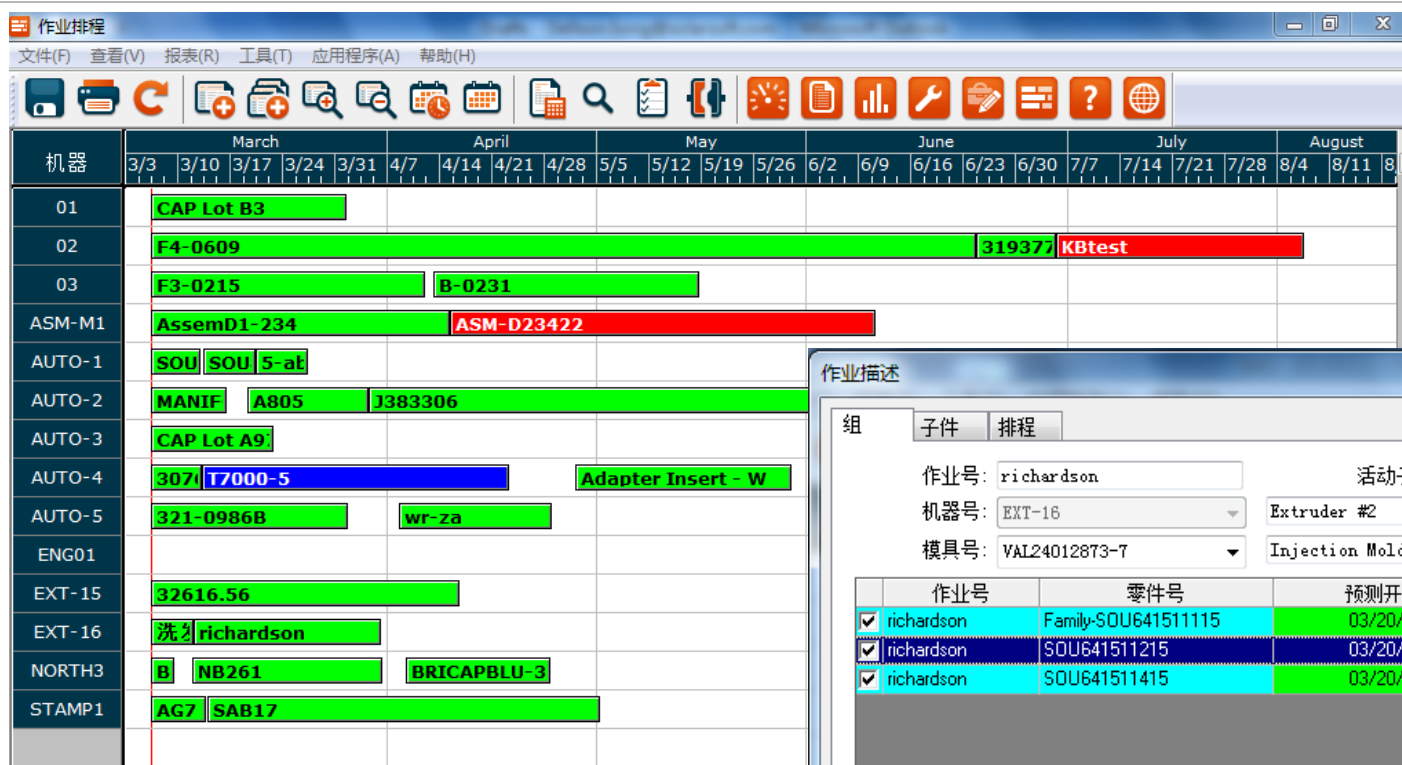
3

整个企业都清楚最新的状况
客户服务、采购

全天候发送生产数据回ERP



实时排程



作业描述

组: 子件 排程

作业号: richardson 活动子件: 3 预测开始: 预测结束:

机器号: EXT-16 Extruder #2 03-20-2013 04-15-2013

模具号: VAL24012873-7 Injection Mold 11:37 12:55

组	作业号	零件号	预测开始	预测结束	状态
<input checked="" type="checkbox"/>	richardson	Family-SOU641511115	03/20/2013 14:37	04/02/2013 13:46	PEND
<input checked="" type="checkbox"/>	richardson	SOU641511215	03/20/2013 14:37	04/15/2013 12:55	PEND
<input checked="" type="checkbox"/>	richardson	SOU641511415	03/20/2013 14:37	04/15/2013 12:55	PEND

确定 取消 应用(A)

- 依据当前生产实际排产
- 可视、拖拉、高亮
- 直观的预期是否满足交付期
- 工艺兼容提醒
- 支持组工单、试验工单模式

Maintenance Manager (Mattec MES® Server) - [Machine PM Codes]

File Configuration Material Logs Application Help

Machine PM Codes

- BANDS
- BAREL
- BCKPR
- BZON1
- BZON2
- BZON3
- call for maintenance
- CHILL
- CLEAN
- CLMPR
- CNVYR
- COOL
- DCMPR
- EJCTR
- EJPIN
- EXMTR
- EXTRN
- FILL
- FILTR
- First off Bad
- First off Good
- FRINJ
- GATE
- GOPTM
- GRIND
- HLDPR
- HLDTM
- HTRBN
- HYDRA
- HYDVL
- INJPR

Edit
New
Copy
Delete
Setup
Save
Cancel
Print

Browse Record

Number : 10
PM Code : BANDS
Description : Check Heater Bands

General | Material List | Overrides

Perform maintenance by run time
Run Time Interval : 400 Hours

Perform maintenance by calendar time
Calendar Time Interval : 0 Days

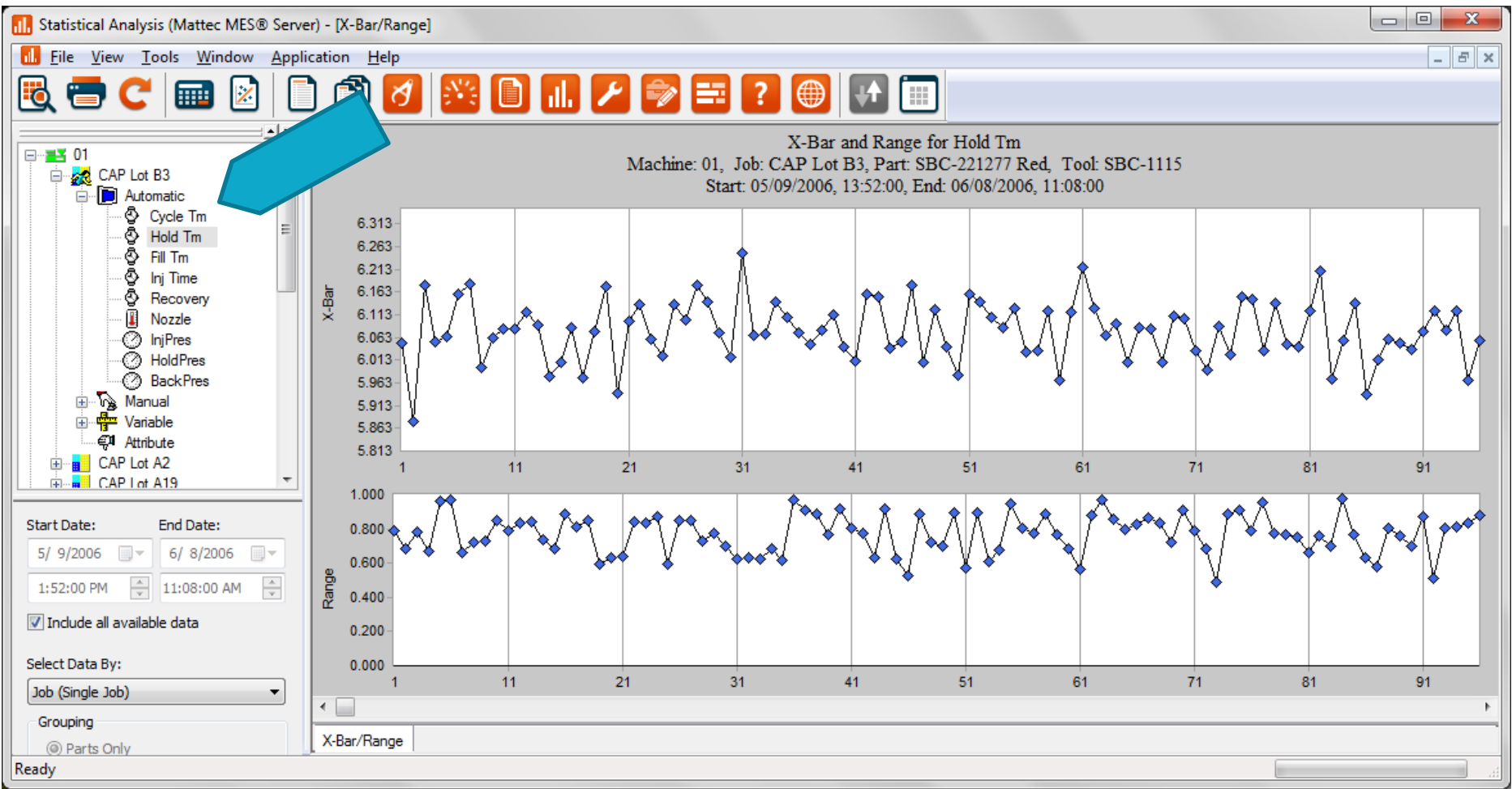
Perform maintenance by machine cycles
Machine Cycles Interval : 35000 Cycles

Personnel Required : 0
Labor Cost (\$/Hour) : 0
Time To Perform : 0 Minutes

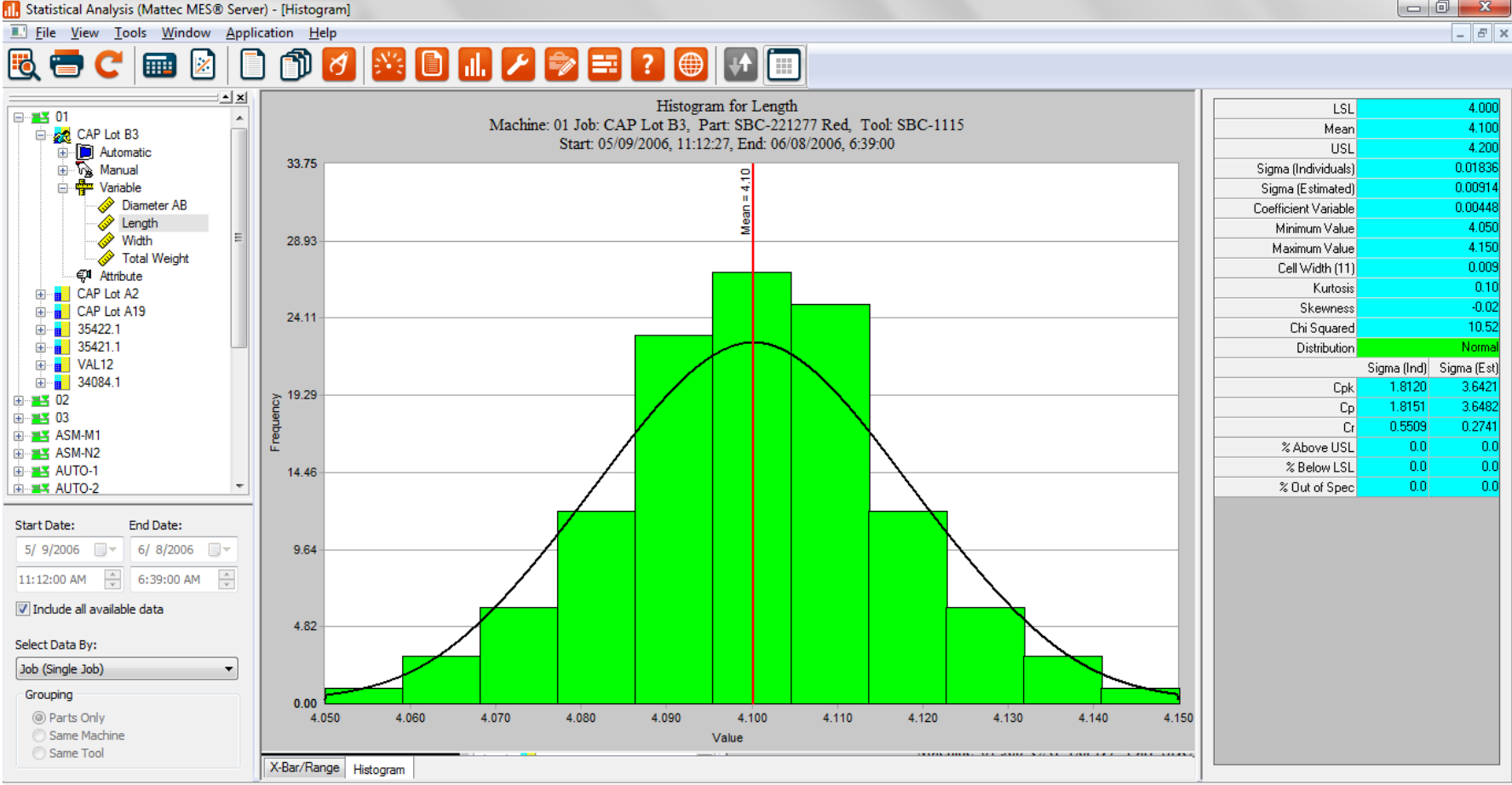
Machine is required to be offline

Machine PM Codes

SPC/SQC - X-Bar/Range



SPC/SQC – 直方图



Ready

能源监控

报告

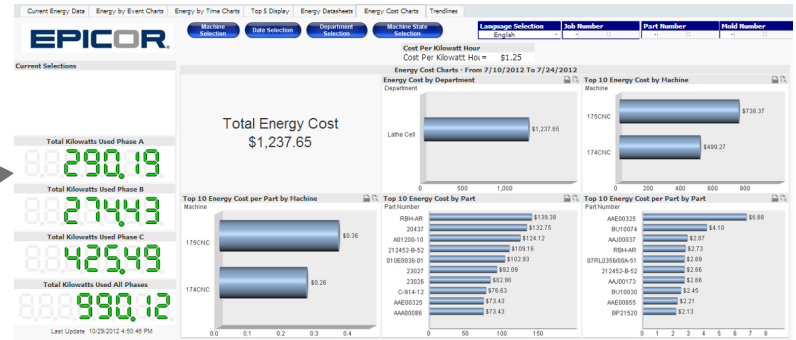
实时记分板和历史报表可以提供能源用量的监控、趋势分析、统计分析等

Machine Number	S/H	Job Number	H/P	Production	Good Prod To Go	Hours To Go	Standard Speed	Actual Speed	Yield Eff	STD CAV	ACT CAV
Automotive - Automotive Manufacturing											
01	1	CAP Lot 83		2953	489791	333:04	23.50	24.0	37.5%	12	8
02	1	S1-0609		1621	173372	225:24	38.60	39.7	65.5%	1	1
02	1	S2-0609		244	50264	767:29	58.60	59.7	116.7%	1	1
02	1	S3-0609		976	101349	625:32	99.20	99.7	97.0%	4	2
02	1	S4-0609		244	49414	634:22	61.00	59.7	98.0%	1	1
09	1	S1-0215		244	57682	379:58	60.00	60.00	81.3%	2	2
09	1	S2-0215		256	57604	738:15	60.00	60.00	105.3%	1	1
09	1	S3-0215		256	57604	738:15	60.00	60.00	105.3%	1	1
ASMA41	1	Assem01_254		100	999900	10194:01	30.00		76.6%	1	1
AUTO-1	1	SOU112-B	*	501	153819	135:45	5.00	10.00	83.5%	6	2
AUTO-2	1	MANFOLD-0123	*	1466	135003	220:53	12.00	11.00	97.7%	2	2
AUTO-3	1	CAP Lot 4978	*	501	489798	347:16	3.50	0.00	81.2%	1	1
AUTO-4	1	SOU101-A2	*	3559	47523	139:29	10.00	10.60	104.5%	1	1
AUTO-5	1	S21-09968	*	1393	182142	536:14	10.00	11.26	83.1%	1	1
EXT-15	1	S2616.56	*	129.0	332309.0	1215:16	15.00	100.00	0.2%	4	4
EXT-16	1	TTTTTTA197	*	1466	4401106	114:20	1.40	10.50	97.7%	20	19
NORTH3	1	E-0850	*	400	106472	76:27	20.10	20.6	100.0%	8	8
STAMP3	1	A571.04.3	*	36	13264	153:41	7.00	7.50	123.5%	1,000	1,000
Blow - Blow Molding & Film											
BLOW1	1	WR-0218		2386	59197	176:36	8.00	11.8	96.6%	1	1
BLOW2	1	B-1314		2439	467545	151:23	10.00	10.2	103.1%	1	1
BLOW3	1	WR-0125		4927	188392	304:51	10.00	12.0	103.2%	2	2
BLOW4	1	WR-0127		2470	694296	2248:51	10.00	11.5	103.5%	1	1
TOWERS											

采集

通过OPC方式，能源的用量被发送并存储在Mattec的数据库中

Mattec MES



监控

安装在设备上的能源监控设备可以监控电力、气体等用量



Current Energy Data | Energy by Event Charts | Energy by Time Charts | Top 5 Display | Energy Datasheets | Energy Cost Charts | Trendlines



Machine Selection | Date Selection | Department Selection | Machine State Selection | Language Selection (English) | Job Number | Part Number | Mold Number

Cost Per Kilowatt Hour
 Cost Per Kilowatt Hour = \$1.25

Current Selections

Total Kilowatts Used Phase A
290.19

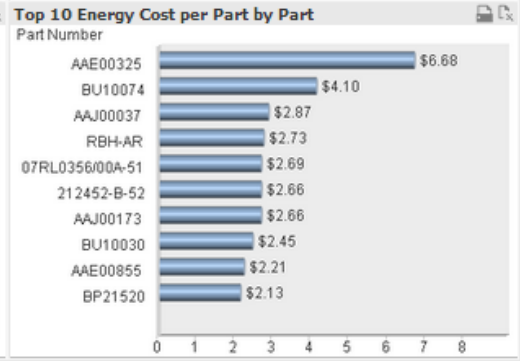
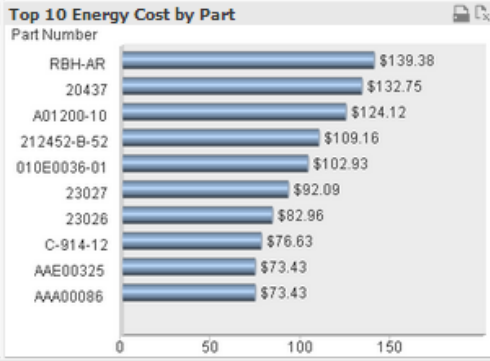
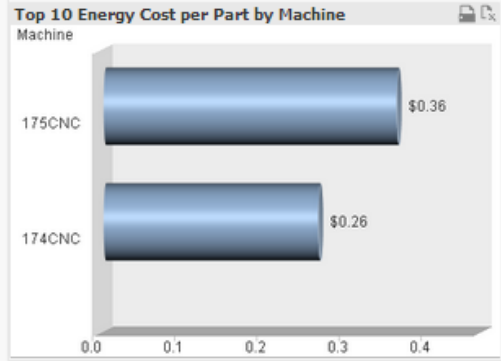
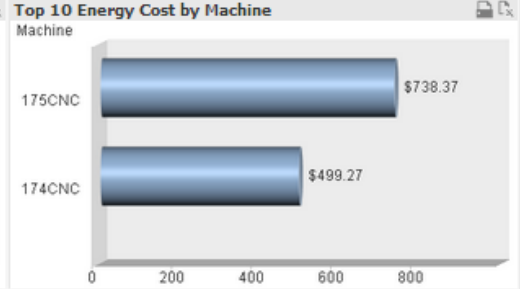
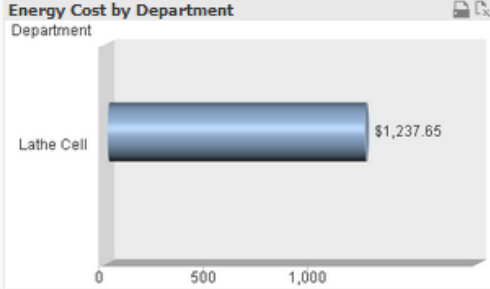
Total Kilowatts Used Phase B
274.43

Total Kilowatts Used Phase C
425.49

Total Kilowatts Used All Phases
990.12

Last Update 10/29/2012 4:50:48 PM

Energy Cost Charts - From 7/10/2012 To 7/24/2012



客户调研

我们向100家制造商询问 Epicor MES 如何帮助改进他们的业务：

节省周期时间

10.8%

调度时间节省

12.6%

总工厂生产率提高

9.3%

机器停机时间减少

9.8%

谢谢！

电话： **021-6391 2808**

电邮： **asiamarketing@epicor.com**

www.epicor.com