Development of Real-time Information Management System(RIMS) to Continuous Galvanizing Line(CGL) at the Asan Bay Works, Dongbu Steel Co., Ltd.

May 11-14, 2003 2003 OSIsoft Users Conference



Dongbu Steel Co., Ltd.

www.dongbusteel.co.kr

Contents

- Who are we?
- Motivation
- The Goal
- What is new?
- The results
- Developed applications: #1~#4

Products

Cold Rolled



Galvanized



Prepainted



TP / TFS



Pipe



H Beam



CHQ Wire



P.E.B



CD Bar



Works & Offices

Inchon Works



Asan Bay Works







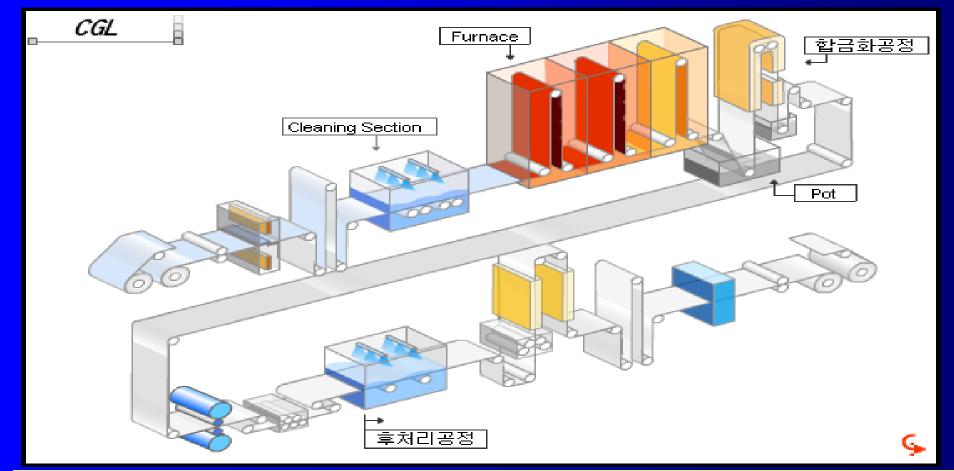
Pohang Works



Motivation

What does the CGL (Continuous Galvanizing Line) make?

By utilizing the "sacrifice anode effects" of zinc layer over steel it gives steel the corrosion resistance capability with lower production cost



For what and ...?

- Improvement of Quality
 - Low Production Cost



By What and How?

Motivation

What we need?

Data type

Large amount of real-time data

Application

Unrestricted for operator, maintenance and technical members

Data reliability

Challenge

Real-time monitoring

Storage

On-line storage over 3 years

Accessibility

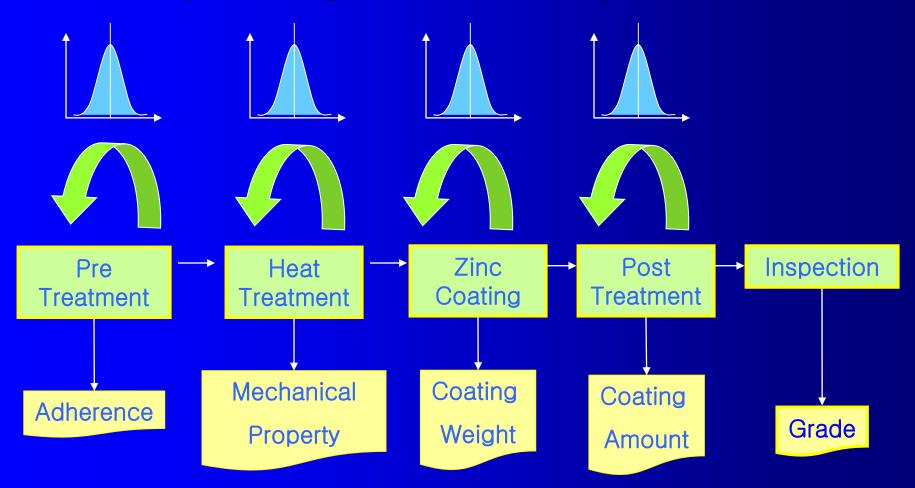
Intranet / Internet Korean Language

Analysis tools

In-house control



Improving Process Capabilities



What is new? LEVEL 3 The Legacy system Coil Data, Production Result LEVEL 2 RIMS Server LEVEL 1 (PLC, DCS) Real-time Data **TOSHIBA** SIEMENS IRMS RIMS User Real-time measurement Thickness Temp. Coating Current Tension Pressure ...



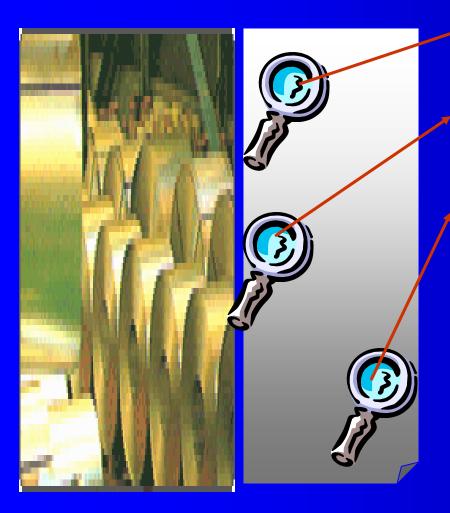
RIMS Architecture AP/WEB Server RIMS Server OS: Windows 2000 S/W: VB, ASP, Oracle **RIMS Clients** OS: Win 2000 Server OS: Win 98/ME/NT/2000 S/W: PI Server S/W(Tags) S/W : Web based PI Clients RIMS Clients Package OS: Win 98/ME/NT/2000 S/W: PI Clients Package, REARCOLD PI Applications RTDB wIN2000 Server LAN(TCP/IP 인터넷 OS: Win NT/2000 S/W : PIAPI, PI Interface CP-1613(PC唯告CP-1413(ISA) H1 Industrial Ethernet SiemensPLC SiemensPLC Siemen PLC SiemensPLC Siemen PLC Siemen PLC

1st Stage Development Results

Tag	820ea (Sensors : 270ea Coil Length Tracking : 550ea)							
Development	Retrieval of archived Real-time Data							
	Coil based data handling (from time based)							
	Process Book and WEB Environment with VB and ASP							
	Inquiry and Analyzing of Production Coils							
System Access	Process Book and WEB with ASP							
OS	Windows 2000							
Service	Process Book with Application Program ✓ Real-time Coil Inspection, Inquiry – 1 screens 6 charts ✓ Real-time Trend Data chart - 10 screens with 93 charts							
	WEB with ASP ✓ The same as Process Book ✓ Inquiry and Analyzing of Production Coils 10 screen with 108 charts							

Main Task: Real-time Coil Inspection

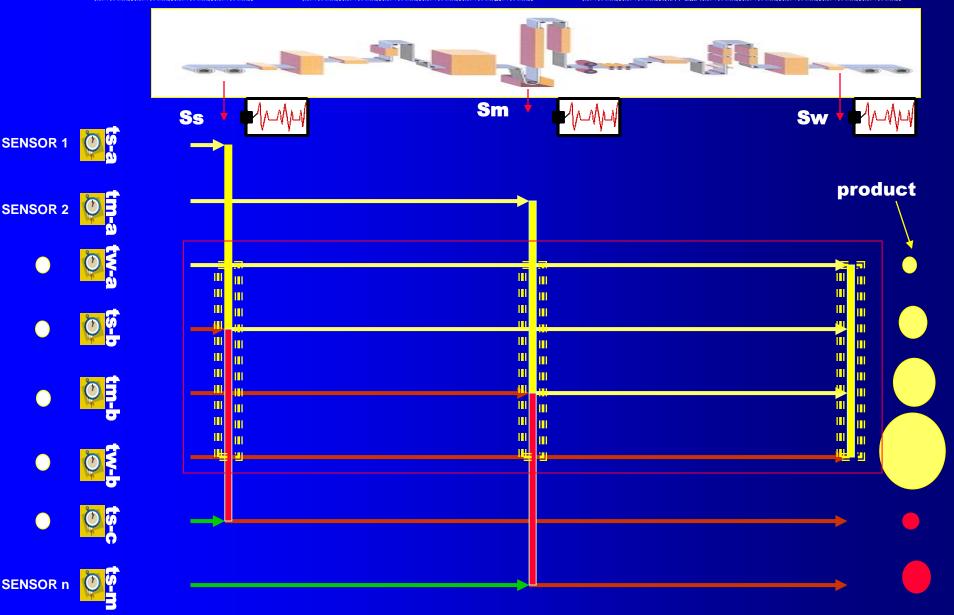
Customers are expecting no-defects.



On every point,
what is the history?
Thickness, Pre-treatment,
Heat treatment, Bath temp.,
Coating amount, Roll force,
Elongation, Amount of oil etc.



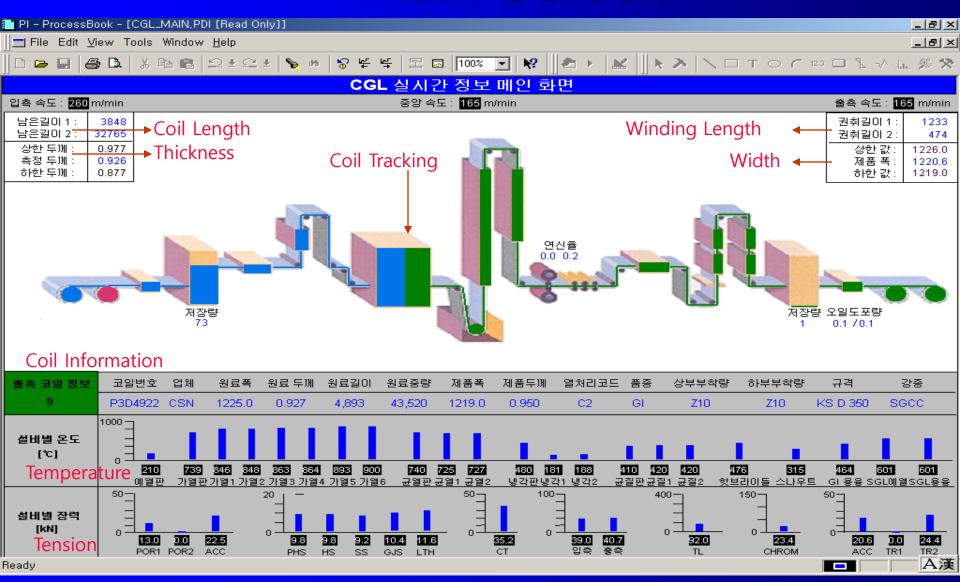
COIL LENGTH TRACKING







Main Screen







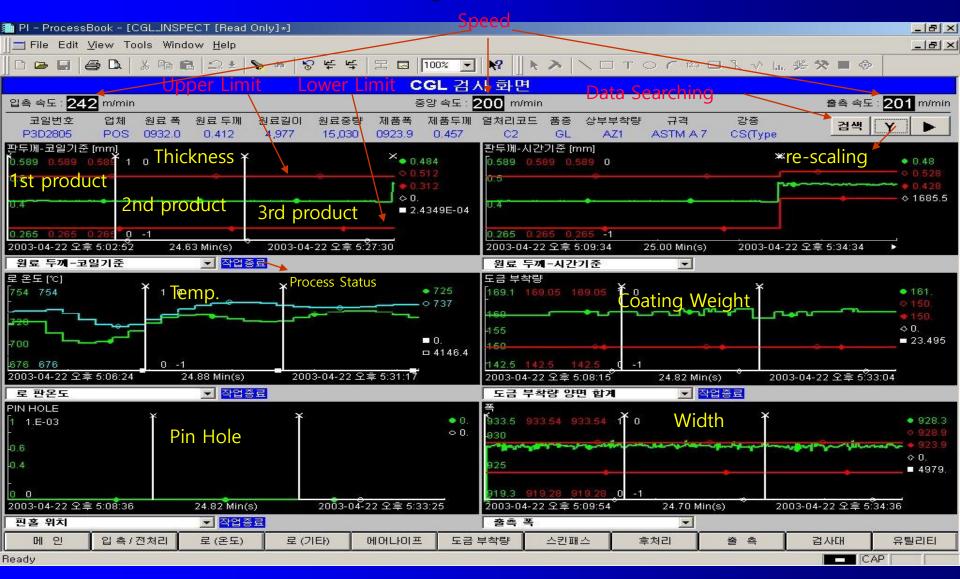
Entry







Inspection







즐겨찾기

DONGBU STEEL ASAN BAY WORKS CGL RIMS (Ver 3.0)

조회날짜 2002/04/07 ~ 2002/04/08 ⓒ 소재 P2D0657

🗿 동부제강 아산만공장 RIMS CGL - Microsoft Internet Explorer

주소(D) 🞒 http://rimsappl/ver3/main.htm

도금/SP >> 아연부착량진후면(평균합계)

ⓒ 현재 P2D0707

파일(F) 편집(E) 보기(V) 즐겨찾기(A) 도구(T) 도움말(H)

Chart

냉각

○ 제품 P2D0657

코일번호 조히

WEB version

Sheet 🛄 🗗 🔀 등부제강 아산만공장 RIMS CGL - Microsoft Internet Explorer 파일(F) 편집(E) 보기(V) 즐겨찾기(A) 도구(T) 도움말(H) ▼ 🔗이동 연결 » ▼ 🔗 이동 연결 » 주소(D) 🗗 http://rimsappl/ver3/main.htm P2D0657 P2D0657 DONGBU STEEL ASAN BAY WORKS CGL RIMS (Ver 3.0) 도금/SP >> 아연부착량전후면(평균합계) 코일번호 조회 코일번호조회 데이타갱신 ⑥ 현재 P2D0707 조회날짜 2002/04/07 ~ 2002/04/08 ② 소재 P2D0657 ○ 제품 P2D0657 코일번호조회 데이타갱신 소재코일정보 P2D0657 제품코일정보 P2D0657 업체KWS 열처리코드 D1 작업개시시각 42.470(kg) 품종GA 작업완료시각 상부부착량F12 규격KS D 350 중량(계산) 1,227,0(mm) 하부부착량F12 강종 SGCD 1 차트정보 P2D0657 차트정보 P2D0657 차트 P2D0657 ABCD CHART | SHEET 길이(m) 길이(m) 3,703 Microsoft Office Spreadsheet 표준편차 표준편차 1.275 | ν | λ 🖺 🖺 | Σ | રૂ | રૂ | 🥞 💆 💽 소재하/상한(g/m2) 소재하/상한(a/m2) 제품하/상한(g/m2) 120.0/120.0 제품하/상한(g/m2) 120.0/120.0 측정값 출측 CUT 수 출측 CUT M 출측 CUT 길이 최대값(g/m2) 최대값(g/m2) 123.4







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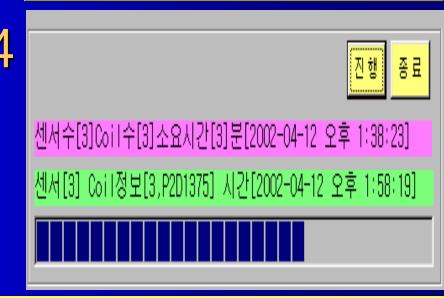
Appl. #1: Retrieval of Operation Data

Menu

🔞 CGL RIMS 검색 화면 _ 🗆 × 선택된 센서: D D 시작시간 2002-4-11 12:00:00 ▼ D D 종료시간 2002-4-11 13:30:54 ▼ ALL DEL D 센서 선택 입측 센서 중앙1 센서 중앙2센서 출측 센서 **v** • • 조회 Group 종료 검색

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날짜 선택	선택된 센서			
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종료시간 2002-4-11 13:30:54 🔻	_D 중앙	아연 분착량 양면평균	D	
	D		ALL DEL	
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입측 센서	중앙1 센서	중앙2 센서	출측 센서	
<u> </u>	<u></u>	양면평균 합계-g/m2	<u> </u>	¥
- 조회 Group				
	검색	종료		
				//

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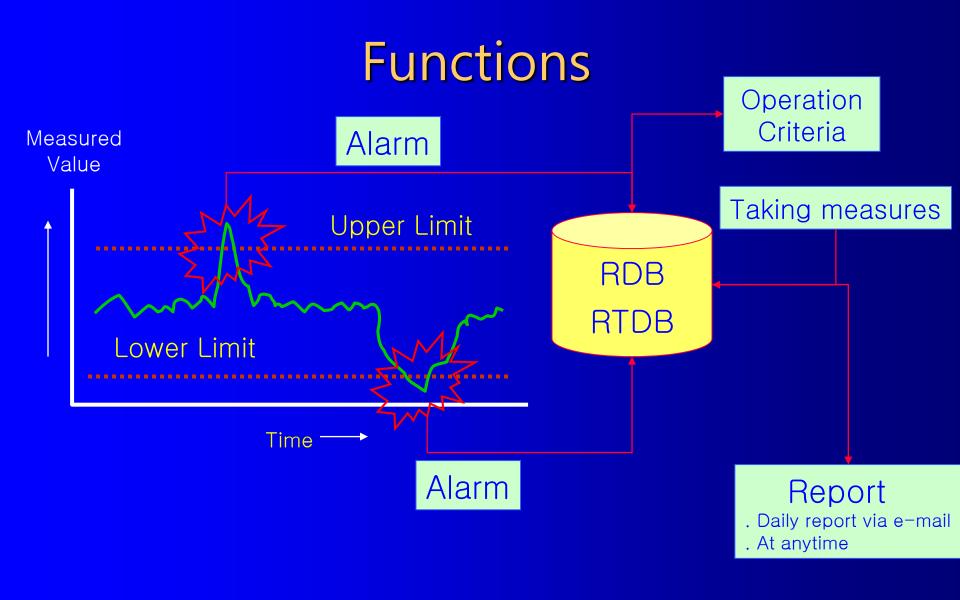


Export to Excel

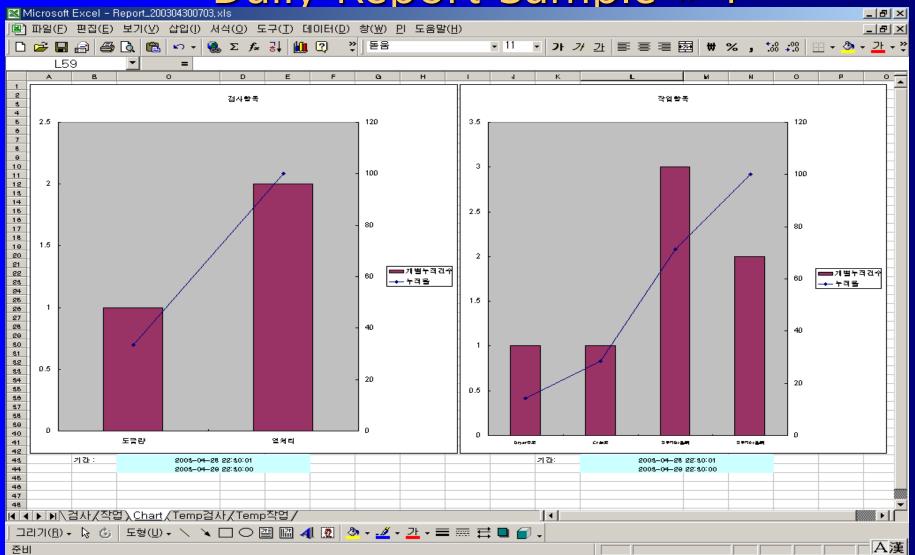
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17	P2D1373	2002-0)4-11	12:05:35	1020	120,0)		109,98	P2D1373	2002-04-11	12:05:34	98,0	119,90		109,98	P2D1373	2002
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22	P2D1373			12:05:49]			P2D1373	2002-04-11			120,60			P2D1373	2002
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24 25	P2D1373 P2D1373			12:05:58			0			P2D1373	2002-04-11		146,0	119,90			P2D1373	2002
26	P2D1373			12:05:59	153.0)			P2D1373 P2D1373	2002-04-11		153,0 157,0	119,90 119,70			P2D1373 P2D1373	2002
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29	P2D1373			12:06:23)		114,95999		2002-04-11			119,80		114,95999		2002
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34	P2D1373			12:06:39)			P2D1373	2002-04-11		211,0	126,60		114,95999		2002
35	P2D1373	2002-0	4-11	12:06:42	226,0	126,5)		114,95999	P2D1373	2002-04-11	12:06:35	215,0	126,30		114,95999	P2D1373	2002
36	P2D1373	2002-0	4-11	12:06:43)		114,95999		2002-04-11	12:06:38		126,30		114,95999	P2D1373	2002
37	P2D1373			12:06:48)		114,95999		2002-04-11		222,0	125,70		114,95999		2002
38	P2D1373			12:06:49)		114,95999		2002-04-11			125,70		114,95999		2002
39	P2D1373			12:06:53)			P2D1373	2002-04-11			125,30		114,95999		2002
40	P2D1373			12:06:57	257,0)		114,95999		2002-04-11		249,0	125,30		114,95999		2002
41	P2D1373			12:07:08)			P2D1373	2002-04-11		257,0	125,20		114,95999		2002
42	P2D1373			12:07:09]		114,95999		2002-04-11		268,0	125,10		114,95999		2002
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Appl. #2: Monitoring and Daily Report System - Line Operation and Quality Related Items



Daily Report Sample #\1



Daily Report Sample #2

國 파일(E) 편집(E) 보기(V) 삽입(I) 서식(Q) 도구(T) 데이터(D) 챵(W) 인 도움말(H) · **ル** ル ユ 軍 軍 國 #3 CGL 품질이상 Report-검사-작업 2003-04-28 22:30 2003-04-29 22:30 Coil 기본정보 Coil No 생산시작시간 생산종료시간 길이 1 P3D4431 2003-04-28 22:44:56 2003-04-28 23:07:16 0,495 1209 SGCC 4005 8 P3D4431 2003-04-28 22:44:56 2003-04-28 23:07:16 0.495 1209 SGCC Z18 4005 1209 SGCC P3D4431 2003-04-28 22:44:56 2003-04-28 23:07:16 0.495 Z18 Z18 4005 10 P3D4431 2003-04-28 22:44:56 1209 SGCC 2003-04-28 23:07:16 0.495 4005 11 12 Alarm내 역 13 작업항목 관리상한 시작시간 종료시간 바본회수 Alarm내용 Duration 14 2003-04-28 22:49:07 2003-04-28 22:49:17 4 정류기A(쿨롱) 10 15 2003-04-28 22:49:07 4 정류기B(쿨롱) 2003-04-28 22:49:17 Ω 10 2003-04-28 22:39:21 2003-04-28 23:08:43 999 16 29 1 Dryer온도 17 2003-04-28 22:37:51 2003-04-28 23:08:43 31 1 | Cr 농도 30 18 20 21 관리하한 시작길이 종료길이 1367 1397 22 5 1366 1396 30 100 36.3 4077 4093 24 4093 4077 25 26 27 28 29 30 ◀Î◀ ▶ ▶ N 검사 › 작업 《Chart 《Temp검사 《Temp작업 / 그리기(8) - 🗟 🖒 | 도형(1) - 🔪 🗀 🗁 🖾 📾 🚮 🙋 | 🧆 - 🚜 - 🍱 - = 🚃 🛱

E-mail

Sheet

🙈 2003/04/30 #3CGL Daily Report - 한국어(자동 선택) _ | _ | × 파일(F) 편집(E) 보기(V) 도구(エ) 메시지(<u>M</u>) 도움말(H) **9** 20 ₩Q. 4 ◡ 회신 전체 회신 전달 인쇄 삭제 이전 다음 주소 보낸 사람: 3cglrims@dbstl,co,kr 날짜: 2003년 4월 30일 수요일 07:03 받는 사람: bristle@dbstl,co,kr; kabang@dbstl,co,kr; yuneun@dkacs,co,kr; byeong@dbstl,co,kr; bristle_hm@hotmail,com/galvaboy@dbstl,co,kr/enduro21@hanmail,net/ljmk@dbstl,co,kr/ |leedj@dbstl,co,kr; ss<mark>c@dbstl,co,kr; hjl@dbstl,co,kr; stldream@dbstl,co,kr; wichun@dbstl,co,kr</mark> j_bond@dbstl,co,kr; kgb@dbstl,co,kr; dinjang@dbstl,co,kr; skpark@dbstl,co,kr; bomb@dbstl,co,kr; 제목: 2003/04/30 #3CGL Daily Report Report_200304300703,xls (95,4KB) 첨부: #3CGL 일일 품질/작업 보고서입니다. 첨부를 참조하십시요.



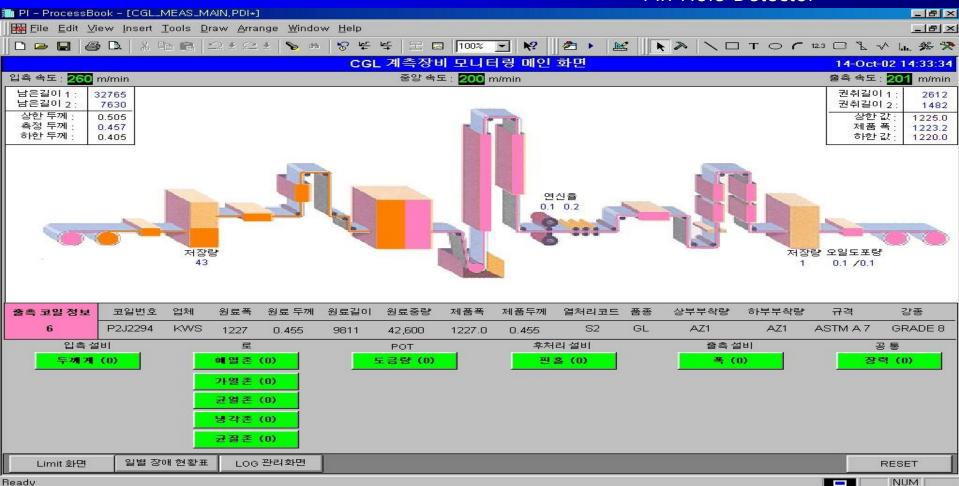


Appl. #3 : Analysis of Measuring Devices

Main Screen

Major Measuring Devices

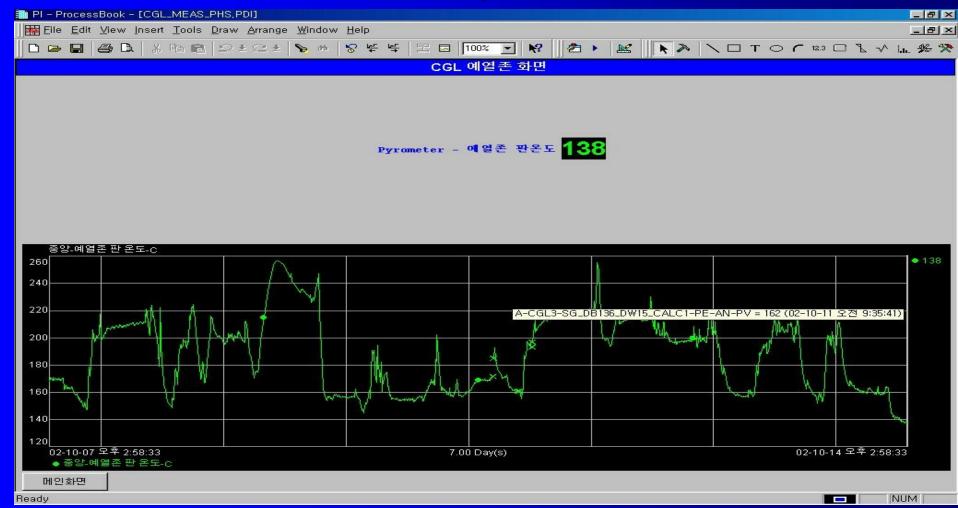
- * Thickness Gauge
- * Furnace Thermometers
- * Zinc Coating Weight
- * Tension Meters
- * Pin Hole Detector







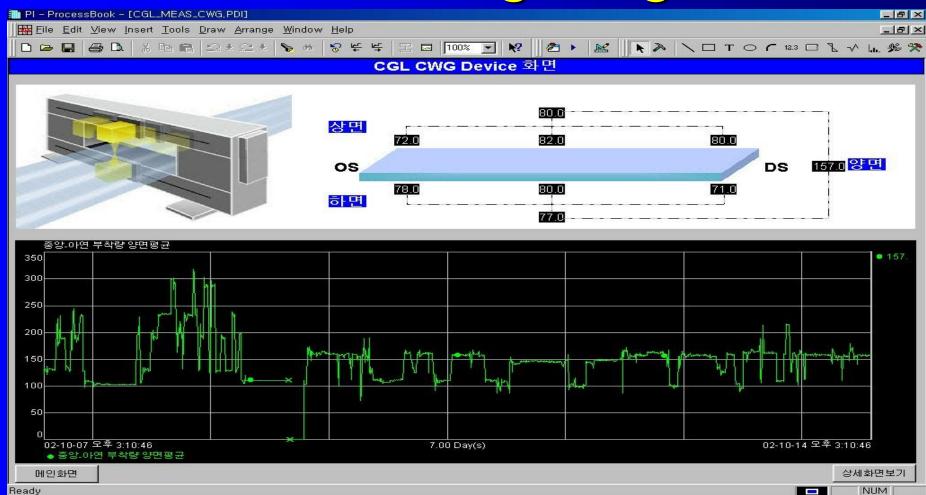
Furnace Temperature



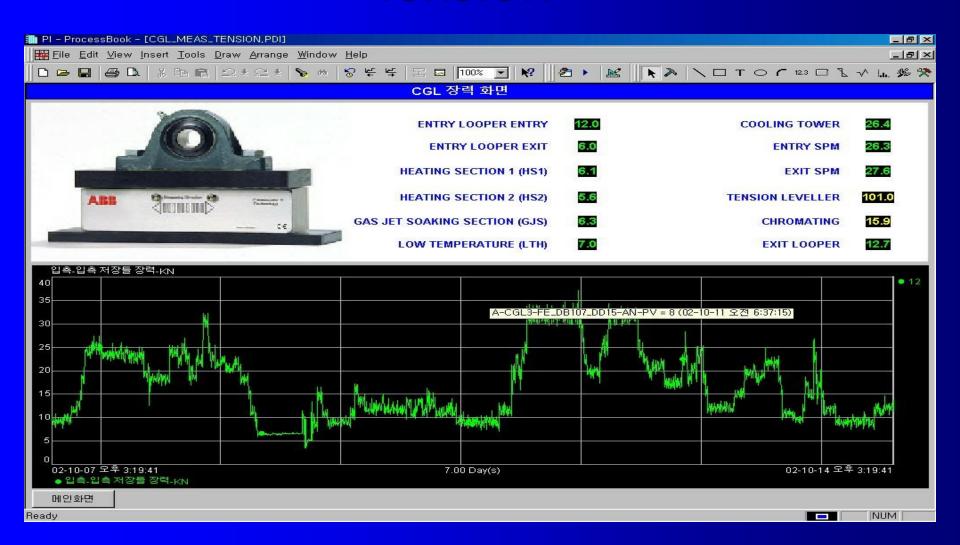




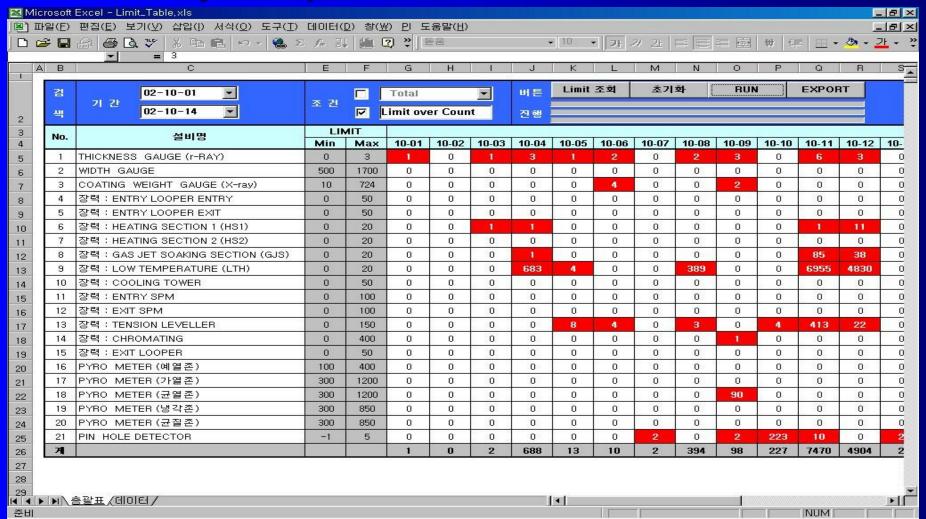
Zinc Coating Weight



Tension



Daily Report – Sensor Trouble



Logging

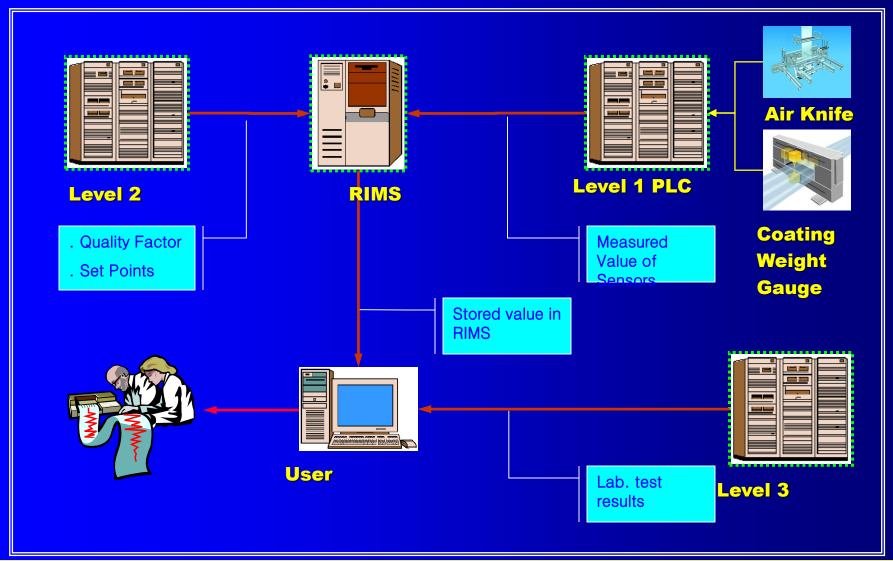




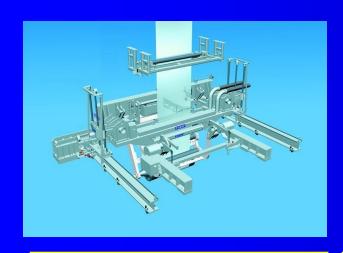


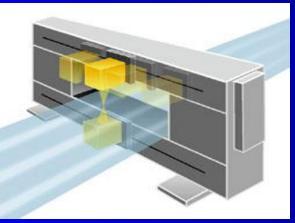
Appl. #4: Analyzing Zinc Coating Weight

Analysis System Configuration



Data Sources





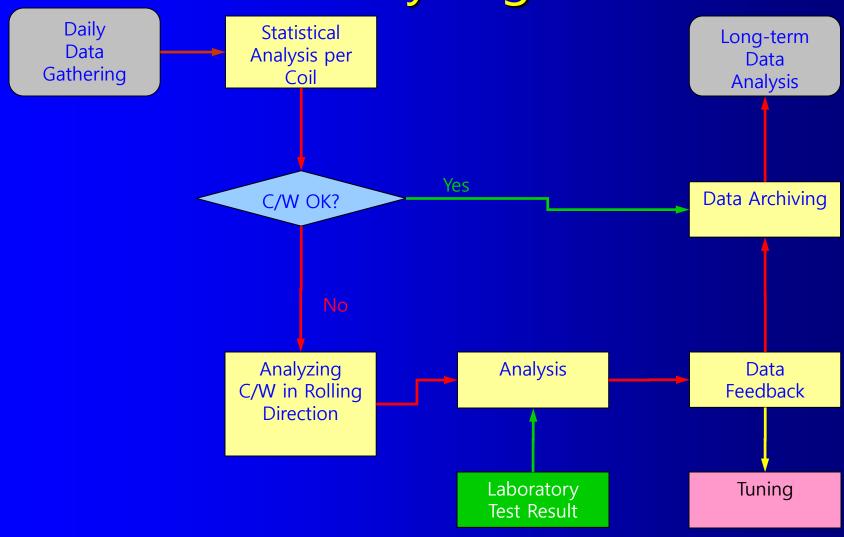


Air Knife

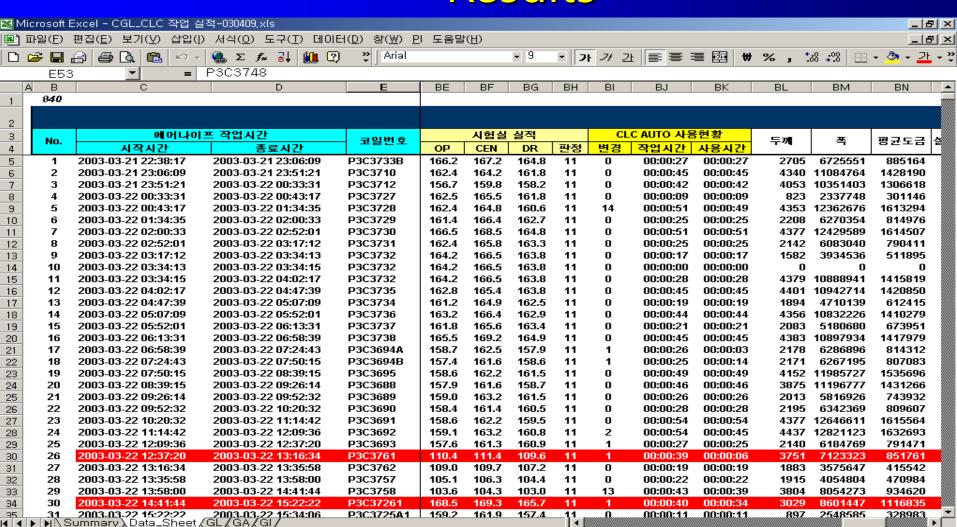
Coating Weight Gauge

Laboratory Test Results





Results





준비



Α漢

□ ○ 酉 Ⅲ 4 ②

¿ Questions

