



NS

18

**NIAGARA
SUMMIT**

**CONNECTING
THE WORLD**

Introduction

Introduction

Agenda

- Introduction
- Case study
- Solution deep dive
 - HW
 - Integration
 - SW
- Q&A

Moderator

- Mike Dennehy, Tridium

Presenters

- Greg Barnes, ActiveLogix
- Andres Suazo, Phoenix Contact
- Sajaad Chaudry, lotDots
- Mark Reitzel, Tridium

Real projects, real savings

In process

Projects	3	1	1
Processes	7	13	27
Savings	\$1.2M	\$3.1M	\$1.2M

Completed

Projects	11
Processes	15
Savings	\$7.3M



North America 8
Europe 2
Asia 1

Case Study

In process

Projects	3	1	1
Processes	7	13	27
Savings	\$1.2M	\$3.1M	\$1.2M

Completed

Projects	11
Processes	15
Savings	\$7.3M



Greg Barnes
ActiveLogix

Solution deep dive

In process

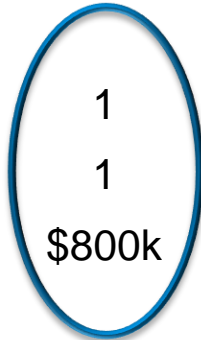
Projects	3	1	1
Processes	7	13	27
Savings	\$1.2M	\$3.1M	\$1.2M



Andres Suazo
Phoenix Contact

Completed

Projects	11	1
Processes	15	1
Savings	\$7.3M	\$800k



Sajaad Chaudry
lotDots



Mark Reitzel
Tridium



Thinking Outside the Box: Niagara Case Study

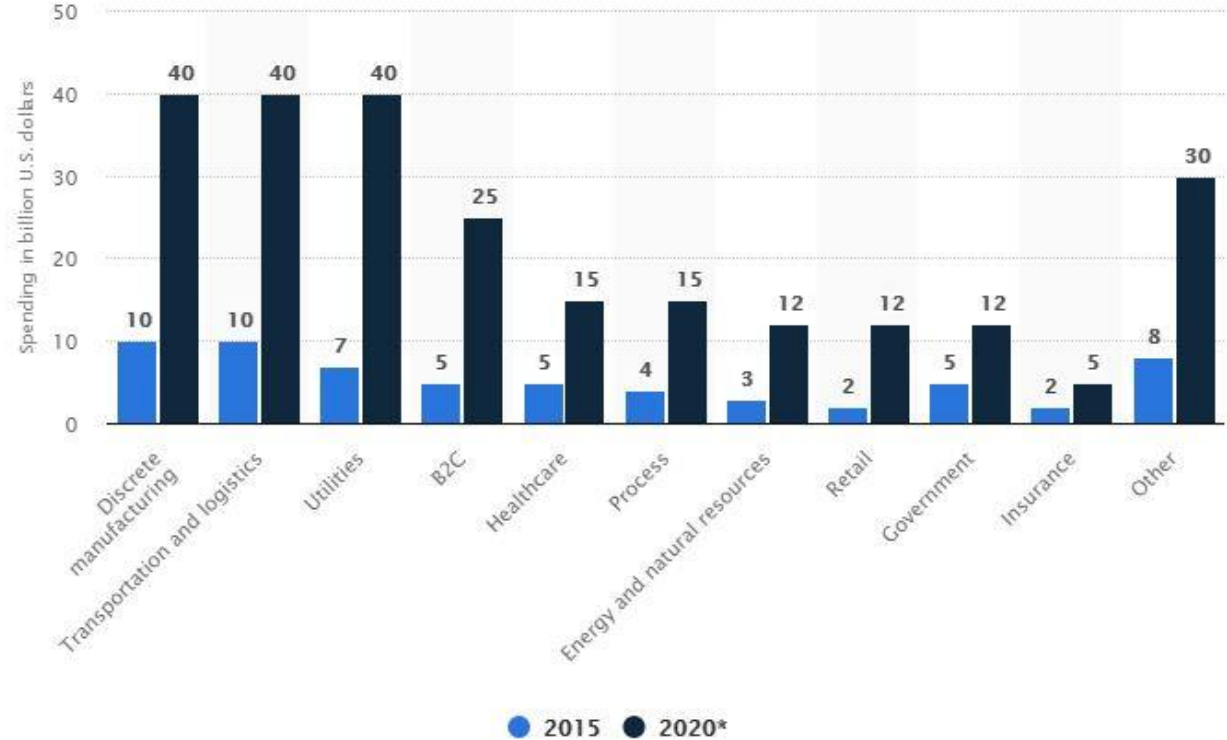
Greg Barnes – Activelogix, LLC

Thinking Outside the Box:

Niagara Case Study - Industrial IoT Systems

IloT is here... and Niagara is an Enabler!

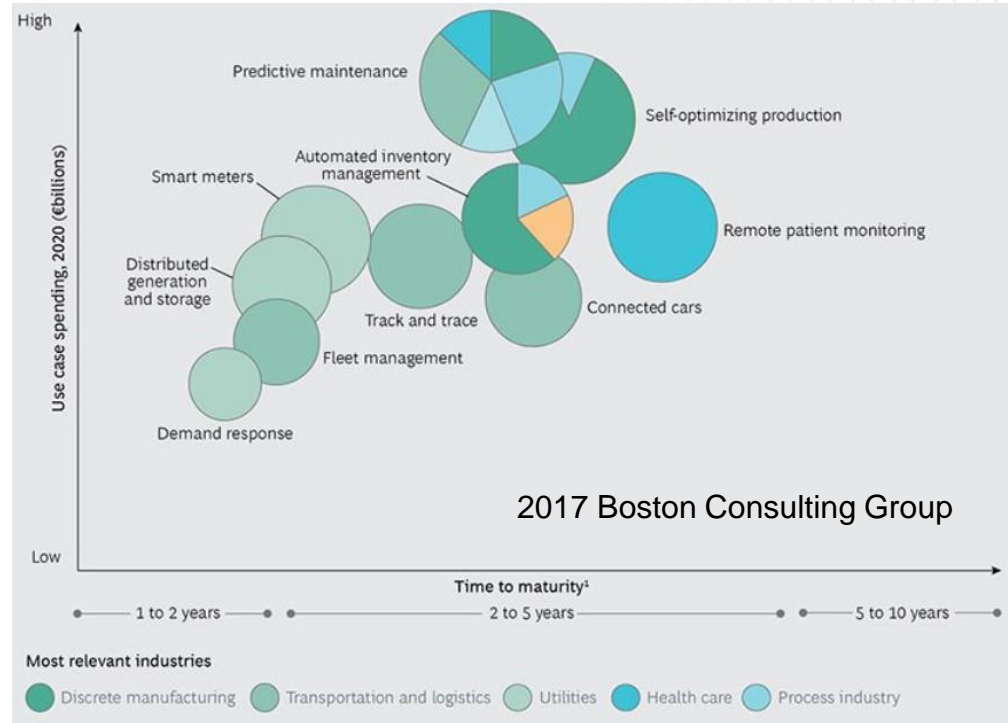
Spending on IloT worldwide by vertical in 2015 and 2020 ...
(*2020 projected in billion U.S. dollars ...Forbes)



Manufacturing Opportunities

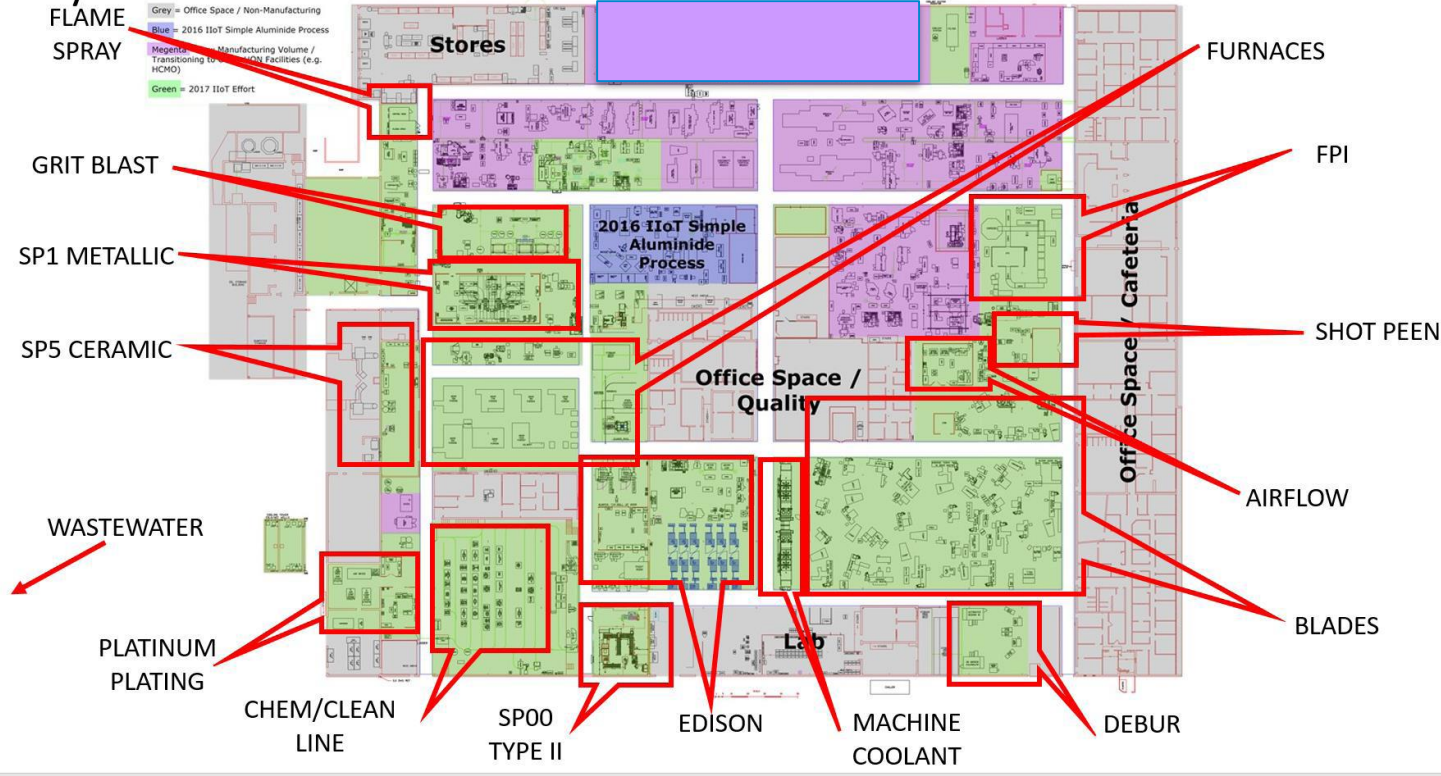
Discrete Manufacturing will take advantage of:

- Predictive Maintenance
- Self-Optimizing Production
- Automated Inventory Mgmt.

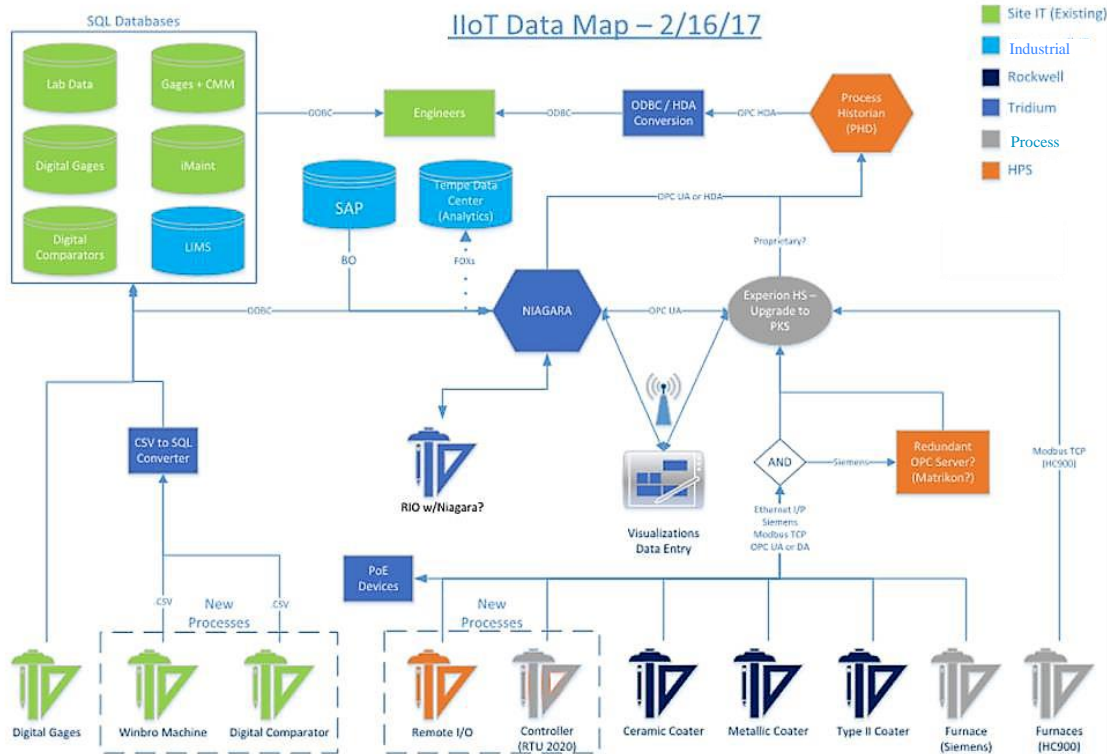


Industrial Case Study

Layout

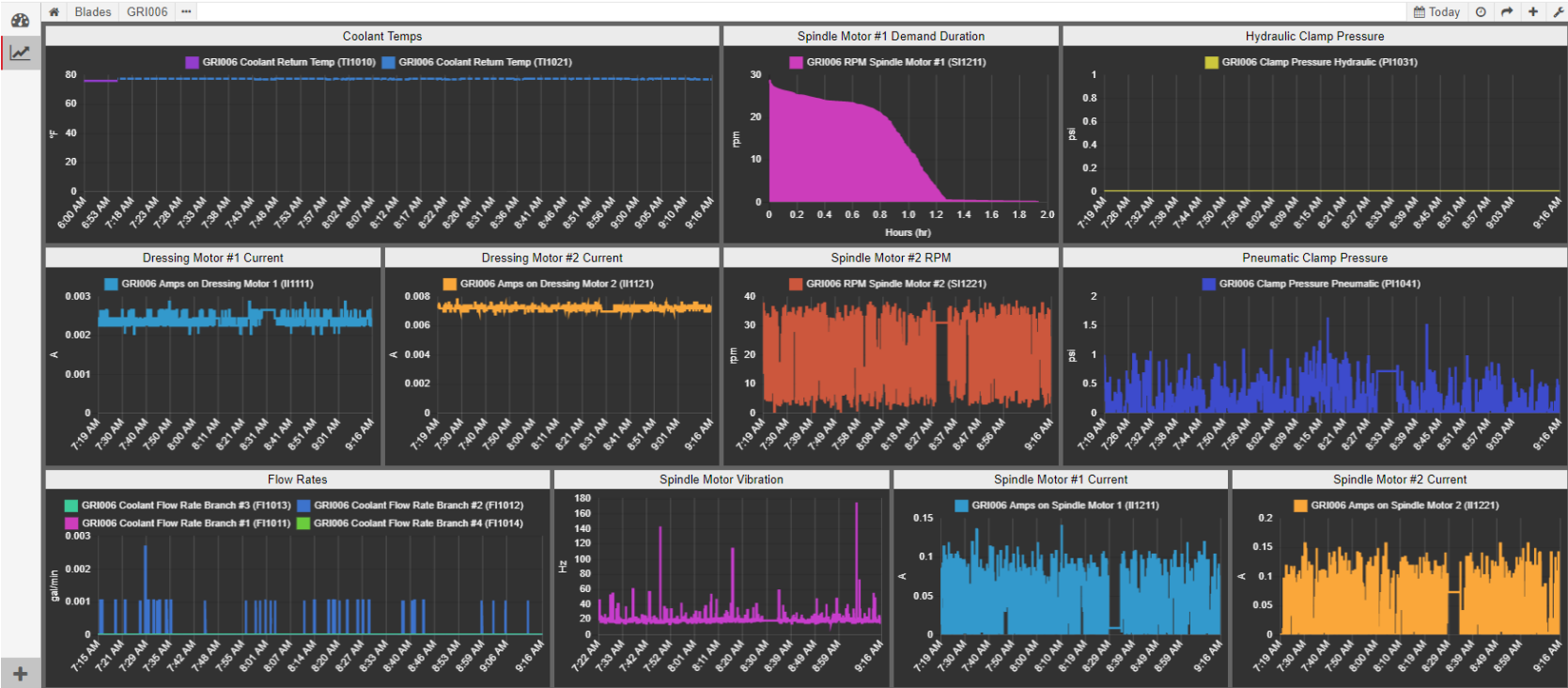


Architecture



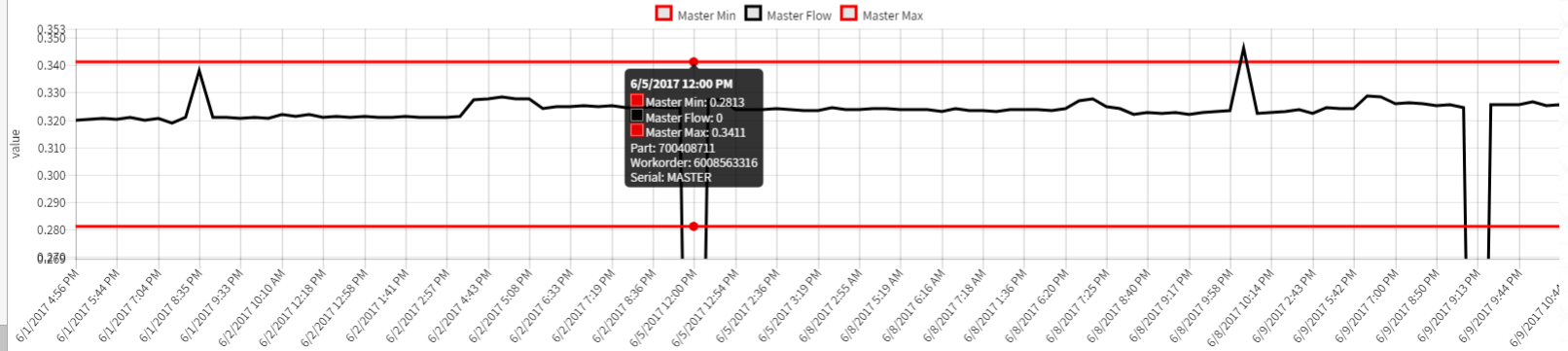
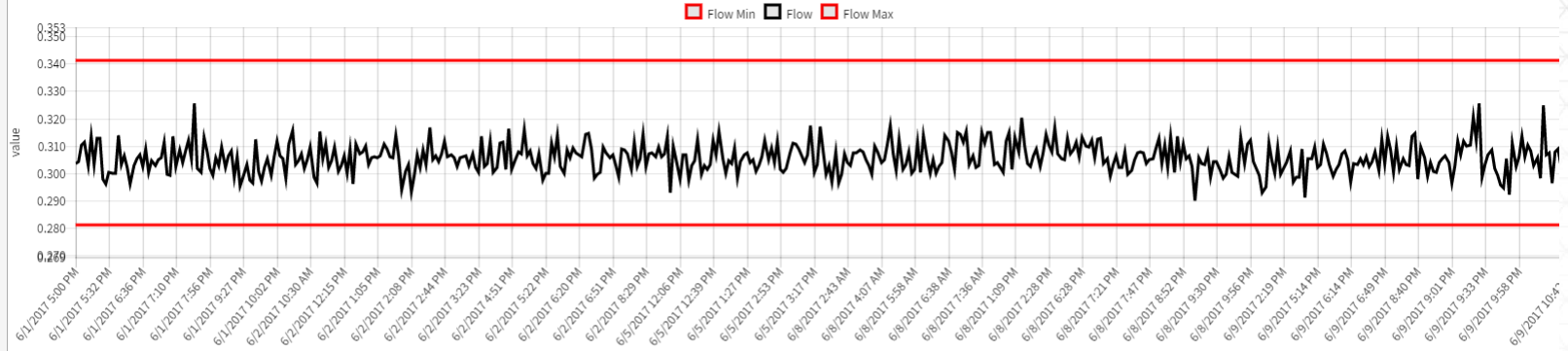
Niagara can be a Key Component in the Solution

- **Measure** – Place sensors in the machines around the plant to gather data
- **Record, Store and Structure/Tag** – Tag machine data to prepare for analytical rules and allow for historical analysis
- **Display** – Deploy Touch screen monitors with Periscope to allow machine operators to monitor real-time variables, operational metrics and machine performance compared to goal
- **Analyze** – Improve process with advanced analytics and correlate with failures to reduce waste and improve performance



Part Number: 700408711

Work Order: None



Thank You!

www.ActiveLogix.com
www.PeriscopeDashboard.com

Solution Deep Dive



Organize and store the data



Management UI



Gather new sensor data



Gather data from existing software



Gather data from existing machines



Niagara Digital Forms



Operator UI

Solution components

- Gather new data
 - new sensors
- Gather existing data
 - existing machines
 - existing software
- Organize and store data
- Digitize manual forms
- Display the data
 - Operator UI
 - Management UI

Hardware

Integration

Software: Digital Forms

Software: User Interface

Hardware

Gather new data

What is currently being used?



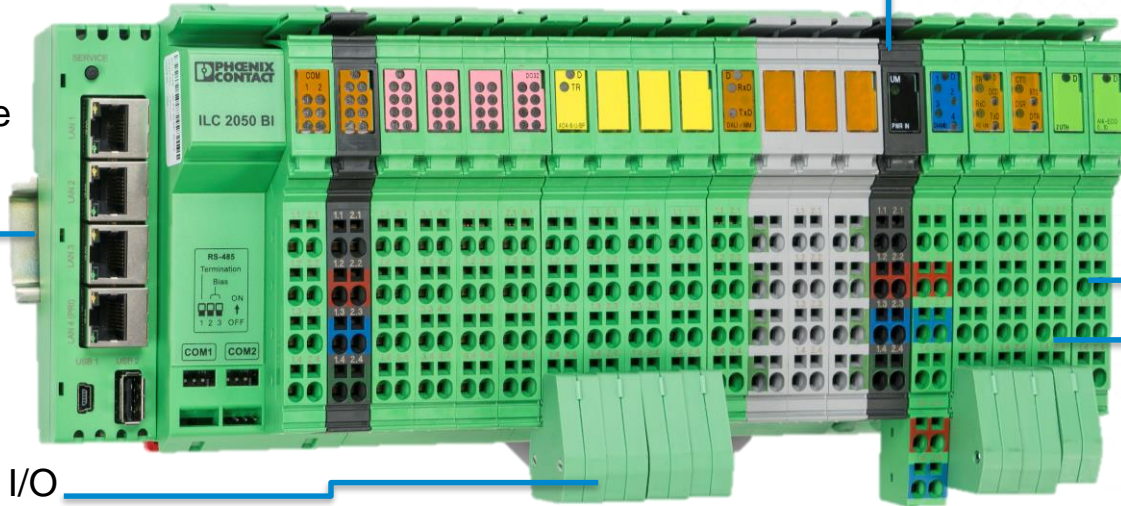
Why is PLC Hardware different?

- Where is the most expensive real estate in the world?
 - Real estate in a control cabinet is expensive and dedicated IO is important
- Industrial environments are considered in testing:
 - More stringent UL testing
 - More concern for signal integrity due to noise constraints
 - Shielding as well as grounding for I/O signals
- Shock and vibration testing for industrial applications

Example of Industrial Hardware

Shield connection
to Din Rail for noise

Bus protection available via
isolation modules for 24 V
and 110 V circuits



Spring cage terminal
for easier installation

I/O terminals are
isolated for noise
reduction

Strain relief and
markings for easier I/O
management

Integration

Gather existing data

Gather data from existing systems

Existing machines

- Controllers: Rockwell, Honeywell
- Databases: SQL, Mongo DB
- SCADA: Ignition, FactoryTalk
- Siemens, Fanuc
- Oracle and SQL/Oracle (encrypted)
- LabVIEW, WinCC

Existing Software

- ERP: SAP, BO3, BO4
- Quality: LIMS
- Maintenance: iMaint
- Historians: PHD
- OPC Servers: Kepware, Matrikon
- SAP MES, POMSNet
- Plex
- Maximo
- FactoryTalk

Protocols

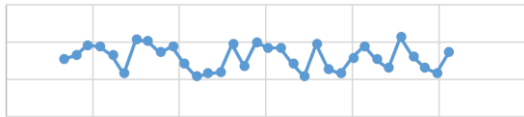
- Modbus native
- Ethernet/IP native
- OPC UA C/S DA/HAD
- File driver
- RDBMS
- Siemens S7 driver
- FANUC FOCAS driver
- OPC Classic Client
- MTConnect Agent

Organize and store the data

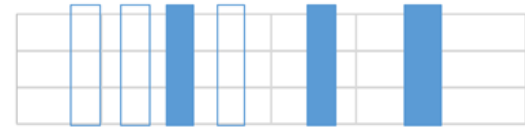
- What parts are good?
 - Data sources: Quality system

Good	Scrap
SN1	SN3
SN2	SN5
SN4	SN6

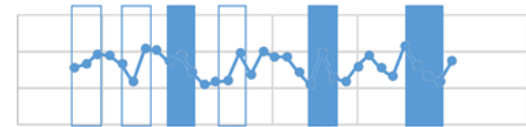
- What were the machine conditions?
 - Sensors: time series data



- When were the parts in the machine?
 - Event data



- Combine the data
 - Identify relationships between sensors and part quality



Software


Digitize manual forms

Niagara Forms

- Data entry tool for Niagara and relational databases
- Replaces Excel and clipboard for manual data collection on mfg floor
- Niagara Add on
 - Form Builder
 - WYSIWYG web form builder
 - Self service, runtime web forms authoring tool
 - Integrated version control
 - No coding needed to build web forms.
 - Form Runner
 - Web server for form data entry
 - HTML5 based – runs on any browser



Simple form example

 Chemical Processing Static Rinse Conductivity Log 1

Important Note

Daily - Measure the PPM TDS of Static Rinses. Calibrate the Ultrameter || 4P or 6P Conductivity Meter using 84 uS/cm Std. (50.5 PPM TDS) before use.
Enter X in D/R column when Dumping and Refilling a tank: to be done when either the rinse is turbid, max. TDS is exceeded, or sooner.

Analyst & Chemist

* Date	* Analyst	Chemist/SCA	Select Calibrate B-4	DI Water
<input type="text"/>	Please select: <input type="text"/>	Please select: <input type="text"/>	<input type="checkbox"/> Calibrate B-4 use x = 84 uS/cm std	<input type="radio"/> G <input type="radio"/> R

Missing or incorrect value


#31 DI Rinse Cad Plating

Gals	Temp Range	3,000 PPM TDS	Select D / R
148 x 2	Ambient	<input type="text"/>	<input type="checkbox"/> D / R

#108 City Water Rns Acid/Descale

Gals	Temp Range	Monitor PPM TDS	Select D / R
104	Ambient	<input type="text"/>	<input type="checkbox"/> D / R


Populate forms with Niagara points

 Bright Anodizing on Aluminum (Reflectors) ✓

Operator Details

Operator Name	Operator ID	Date	
<input type="text" value="Please select:"/>	<input type="text"/>	<input type="text" value=""/>	<input type="text" value=""/>
Room Set Point Value	Temperature Value	<input type="button" value="Read N4 vaues"/>	
<input type="text" value="79.86 {ok} @ 10"/>	<input type="text" value="73.71 {ok} @ 16"/>		

Multi page form example

 Paint ✓

Prep Process

Cleaning Process
Primer Mixing
Primer Application
Rework/Process Sanding
Paint Mixing
Paint Application
Primer/Paint Testing
Demask/Visual Inspection

1 of 9

Prep Process

Operator Badge # Work Order #

Date Window Start Time Stop Time

Part # Order Quantity Accepted Quantity

AOG EXP DP

Rework? Yes No

Pre-Mask Yes No

Comments

Summary Clear PDF Save Finalize Review Send to Niagara

Hand drawn graphic example

4 Paint ✓

Prep Process

Cleaning Process
Primer Mixing
Primer Application
Rework/Process Sanding

1 of 9


Operator Badge #

Work Order #

Date Start Time Stop Time

Part # Order Quantity Accepted Quantity

Pre-Mask Yes No



Summary Clear PDF Save Finalize Review **Send to Niagara**

View submitted forms

The screenshot shows a web browser window with the following details:

- Browser tab: Conformal Coating Primer: X
- Address bar: <https://172.31.66.211:9090/nforms/fr/urbana/Conformal-Coating-Primer-Mixing/summary>
- Page title: Conformal Coating Primer Mixing
- Search bar: Search forms [Show search options](#)
- Table of submitted forms:

	Created	Modified	Operator Badge #
<input type="checkbox"/>	Mar 27	4:03 pm	123123
<input type="checkbox"/>	Mar 27	Mar 27	12334

Navigation and Action Buttons:

- Page navigation: 1 to 2 of 2
- Home:
- Review:
- PDF:
- Duplicate:
- New:

List of available forms

	Status	Modified	Application	Form	Title
<input type="checkbox"/>	Available	9:29 am	Urbana	Form-CP-BrassORCopper-09-04-017	Cadmium Plating on Brass / Copper per Procedure 09-03-016
<input type="checkbox"/>	Available	8:51 am	Urbana	Forms-CP-Bright-Anodizing-09-04-030	Bright Anodizing on Aluminum (Reflectors) - per Procedure 09-03-018, Seq. II
<input type="checkbox"/>	Available	2:04 am	Urbana	Forms-CP-Tin-Plating-on-Steel-09-04-047	Tin Plating on Steel per Procedure 09-03-022
<input type="checkbox"/>	Available	4:08 pm	Urbana	Forms-CP-Bright-Anodizing-09-04-030	Bright Anodizing on Aluminum (Reflectors) - per Procedure 09-03-018, Seq. II
<input type="checkbox"/>	Available	Mar 30	Urbana	Forms-CP-Tin-Plating-on-Brass-Copper-09-04-046	Tin Plating on Brass/Copper per Procedure 09-03-022
<input type="checkbox"/>	Available	Mar 30	Urbana	Forms-CP-Nickel-Plating-on-Steel-09-04-025	Nickel Plating on Steel per Procedure 09-03-021
<input type="checkbox"/>	Available	Mar 30	Urbana	Forms-CP-Nickel-Plating-on-Brass-Copper-09-04-024	Nickel Plating on Brass/Copper per Procedure 09-03-021
<input type="checkbox"/>	Available	Mar 30	Urbana	Forms-CP-Cadmium-Plating-09-04-020	Cadmium Plating on Steel per Procedure 09-03-016
<input type="checkbox"/>	Available	Mar 30	Urbana	Forms-CP-Cadmium-Plating-09-04-019	Cadmium Plating on Steel per Procedure 09-03-016
<input type="checkbox"/>	Available	Mar 30	Urbana	Form-CP-BrassORCopper-09-04-018	Cadmium Plating on Brass / Copper per Procedure 09-03-016
<input type="checkbox"/>	Available	Mar 30	Urbana	Forms-CP-Passivation-of-Stain-Steel-09-04-026	Passivation of Stainless Steel per Procedure 09-03-020
<input type="checkbox"/>	Available	Mar 30	Urbana	Forms-CP-Chemical-Conversion-Coatings-on-Aluminium-09-04-110	Trivalent Chromate Coating per Procedure 09-03-017
<input type="checkbox"/>	Available	Mar 30	Urbana	Forms-CP-Black-Oxide-on-Brass-Copper-09-04-057	Black Oxide on Brass Copper per Procedure 09-03-019
<input type="checkbox"/>	Available	Mar 30	Urbana	Forms-CP-Black-Oxide-on-Brass-Copper-09-04-049	Black Oxide on Brass/Copper per Procedure 09-03-019

Niagara Form Builder

The screenshot shows the Niagara Form Builder web application. The browser window title is "Form Builder" and the URL is "https://172.31.66.211:9090/nforms/fr/builder/edit/001b9d539972fbfc05df7de04b97b6629aaa4dc6". The application header includes the Niagara Framework logo, the text "Form Builder", and links for "Form Builder User Guide" and "English".

The main interface is titled "Bright Anodizing on Aluminum (Reflectors) - per Procedure 09-03-018, Seq. II". It features a left-hand navigation pane with the following sections:

- Form Structure:** New Section, New Grid, New Repeated Grid
- Text Controls:** Text Field, Plain Text Area, Formatted Text Area, Password Field
- Output Controls:** Explanatory Text, Calculated Value
- Typed Controls:** Number, Email Address, Currency, US Phone Number

The main workspace displays a form section titled "Sulfuric Acid Anodize & Hot Water Seal". It contains a "Process Start Time" field with a calendar icon, a "Form 09-04-030 Rev. 36 Date: 3/19/18" label, and a text instruction: "Click on SAP Op Text for fixtures & other instructions".

Below the instruction is a table with four columns: Part Number, Order Number, Qty, and Fixture Number. Each column has a dropdown arrow and an input field.

* Part Number	* Order Number	* Qty	* Fixture Number
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

At the bottom of the workspace is a table with the following content:

Step	Description	Tank	Temp	Time	Bright Anodizing Process
					Clean rack hooks to ensure good

The footer of the application contains buttons for "Summary", "New", "Test", "Publish", and "Finalize".

Niagara credentials

Niagara Forms

powered by
niagara
framework*

Username

Password

Login

version 2.43

Niagara Users and Roles

The image displays two overlapping screenshots of the Niagara Workbench interface. The top screenshot shows the 'Role Manager' window, which contains a table of roles and their permissions. The bottom screenshot shows the 'User Service' configuration for a user named 'mark', with an 'Edit Roles' dialog box open to assign permissions.

Role Manager Table:

Name	Permissions
FormOperator	None
FormBuilder	None
FormUser	None
FormAdmin	None
PCNDataTransferRole	PCNDataTransferC
PointReadRole	PointAccess+rR
HistoryReadRole	ReadDataCategory

User Service Configuration (User: mark):

- Full Name: Mark Reitzel
- Enabled: true
- Expiration: Never Expires
- Lock Out: []
- Language: []
- Email: []
- Authenticator: []
- Facets: []
- Nav File: []
- Prototype Name: []

Edit Roles Dialog (Assigned Roles):

- FormOperator
- PointReadRole
- admin
- FormBuilder
- FormUser
- FormAdmin
- PCNDataTransferRole
- HistoryReadRole

Software

Display the data

User Interface

- Management
 - Decisions impact this month, this quarter
 - Aggregated data from factory floor
 - Performance trends
 - First level of analytics for machines, parts, operators
- Operator
 - Real time
 - Immediate action
 - Alerts, alarms
 - Situational awareness
 - Ease of data entry

OVERVIEW PROCESS OPERATOR DATA DEFECT DATA RANKING

Batch Number

Index Number

Batch Number In **08742228**

Part Number **3194W1**

Batch Index **8**

DATA AVAILABILITY



PRESS / SUMMARY

PASS

Ramp Up Temp	●
Ramp Up Time	●
Dwell Temp	●
Dwell Time	●
Ramp Down Temp	●
Ramp Down Time	●
Hyd. Pressure	●

MOULD / SUMMARY

PASS

Mould Fill	●
Mould Material	●
Mould Process	●
Mould Tooling	●

INSPECTION STATION 1 - TRIM / SUMMARY

PASS

Trim Status	●
-------------	---

OVEN / SUMMARY

PASS

Temperature	●
Time	●

INSPECTION STATION 3 - FINAL INSPECTION / SUMMARY

PASS

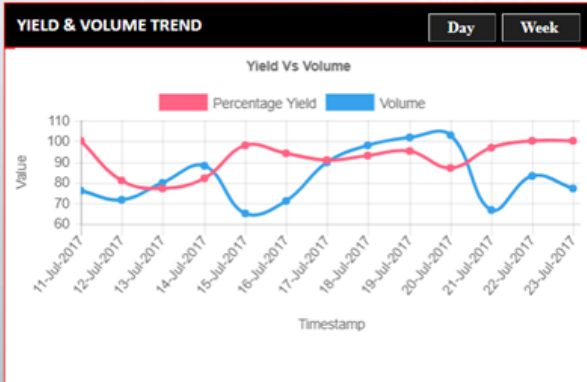
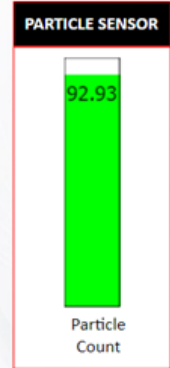
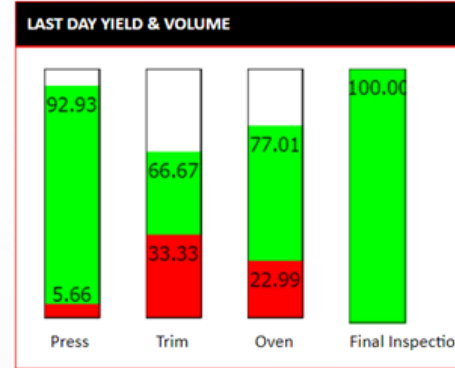
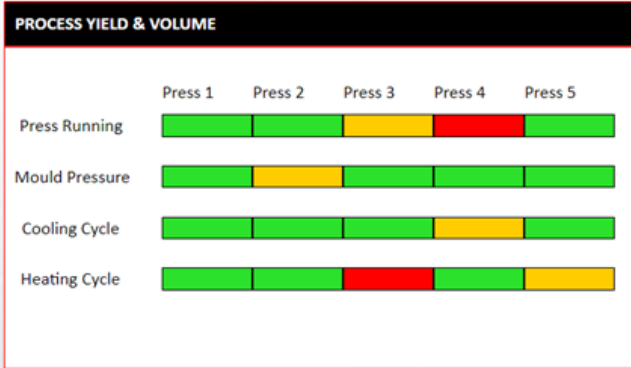
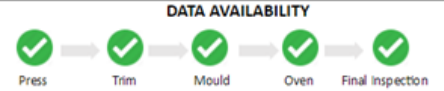
Final Inspection Status	●
-------------------------	---

BLUE LIGHT INSPECTION / SUMMARY

FAIL

Visual	●
Dimensions	●

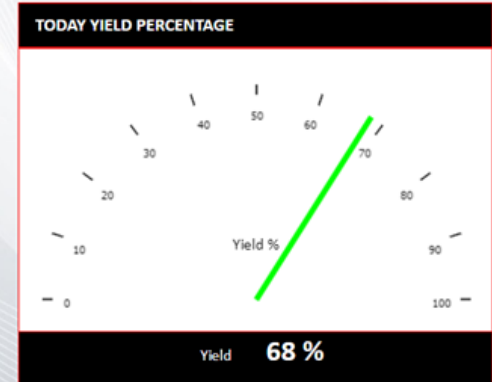
OVERVIEW **PROCESS** OPERATOR DATA DEFECT DATA RANKING



PART NUMBER RANK

CSV

Sl.No	Part Num...	Pass	Fail	Count
1	W7741592	1163	53	1219
2	W2333163	1008	35	1046
3	W0143009	907	8	916
4	W0733194	790	40	831
5	W4473194	704	37	743
6	W1931592	681	32	715
7	W1201592	681	37	719
8	W4233009	361	2	366
9	W3083194	373	7	380



OVERVIEW PROCESS **OPERATOR DATA** DEFECT DATA RANKING

Yield & Volume

Analysis

DATA AVAILABILITY



OPERATOR V/S PART NUMBER WITH HIGH YIELD

CSV

Operator	Best Part Numbers
E342	302009W1
H819	316494W1
H219	151492W0
h111	153392W2
H134	W3073194
H654	W3453169
E453	W3453169
E321	W3453169
e355	W3073194

OPERATOR RANK

CSV

Sl.No	Operator	Pass	Fail	Count
1	H109	2359	61	2425
2	E676	2048	81	2136
3	H208	1994	117	2115
4	H208	780	14	796
5	H134	710	29	740
6	H151	426	21	449
7	H109	448	28	476
8	E837	108	1	109
9	H219	121	3	124

OPERATOR TRAINING BOARD

CSV

Operator	Post Tri...	Not to ...	Gel Spots	Time Te...	Deform...	Mouled...	Tears	Trim	Pin Holes	Damage	Uncure...	Burst Te...	Discolor...	Flow Li...	Fold Ma...	Leaking	Pre Tri...	Total	Percent...
H219	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	124	2.4 %
H122	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	17	100 %
h109	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	100 %
H134	2	0	0	27	1	0	1	0	0	1	0	0	0	1	0	1	2	570	6.7 %
E676	0	0	0	59	0	0	0	0	0	0	0	0	0	0	0	0	0	1583	3.7 %
e856	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	6	66.7 %
H208	0	0	0	108	0	0	0	0	0	0	0	0	0	0	0	0	0	1743	6.2 %

OVERVIEW PROCESS OPERATOR DATA **DEFECT DATA** RANKING

Profile

Analysis

Summary

DATA AVAILABILITY



DEFECT DATA OVER TIME - PAYNTER CHART

Day

Week

Previous

Next

Categories	23-Jul-2017	22-Jul-2017	21-Jul-2017	20-Jul-2017	19-Jul-2017	18-Jul-2017	17-Jul-2017	16-Jul-2017	15-Jul-2017	14-Jul-2017	13-Jul-2017	12-Jul-2017	11-Jul-2017
Post Trim Contamination	0	0	0	0	0	0	0	0	0	0	0	0	0
Not to drawing requirements	0	0	0	0	0	0	0	0	0	0	0	0	0
Gel Spots	0	0	0	0	0	0	0	0	0	0	0	0	0
Time/Temperature	0	0	2	10	2	3	4	4	1	15	6	10	0
Deformation	0	0	0	0	0	0	0	0	0	0	0	0	0
Moulded Forr	0	0	0	0	0	0	0	0	0	0	0	0	0
Tears	0	0	0	0	0	0	0	0	0	0	0	0	0
Trim	0	0	0	0	0	0	0	0	0	0	0	0	0
Pin Holes	0	0	0	0	0	0	0	0	0	0	0	0	0
Damage	0	0	0	0	0	0	0	0	0	0	0	0	0
Uncured Elastomer	0	0	0	0	0	0	0	0	0	0	0	0	0
Burst Test	0	0	0	0	0	0	0	0	0	0	0	0	0
Discolor Staining	0	0	0	0	0	0	0	0	0	0	0	0	0
Flow lines	0	0	0	0	0	0	0	0	0	0	0	0	0
Fold marks	0	0	0	0	0	0	0	0	0	0	0	0	0
Leaking	0	0	0	0	0	0	0	0	0	0	0	0	0
Pre-trim Contaminator	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Inspected	77	83	67	103	102	98	90	71	65	88	80	72	76
Total Passed	0	0	0	0	0	0	0	0	0	0	0	0	0
Percentage Yield	100.00	100.00	97.01	87.38	95.10	93.88	91.11	94.37	98.46	82.95	77.50	81.94	100.00

OVERVIEW PROCESS OPERATOR DATA **DEFECT DATA** RANKING

Profile

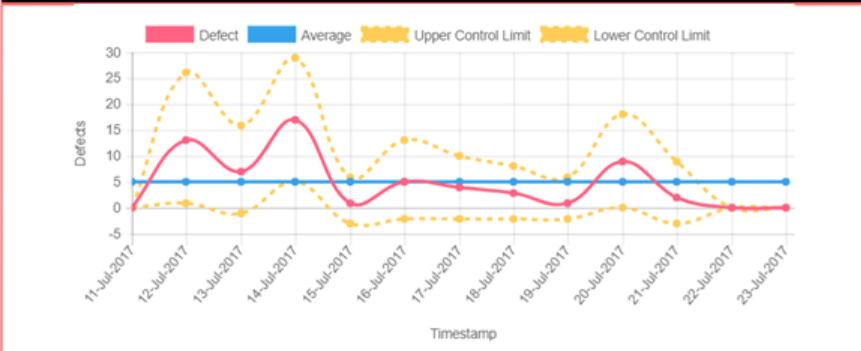
Analysis

Summary

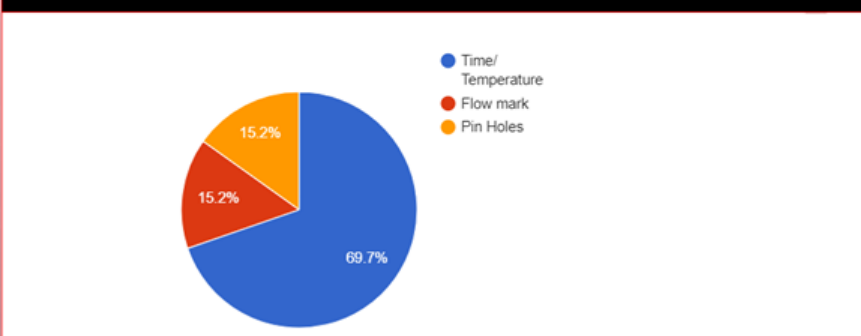


DEFECT ANALYSIS - P CHART

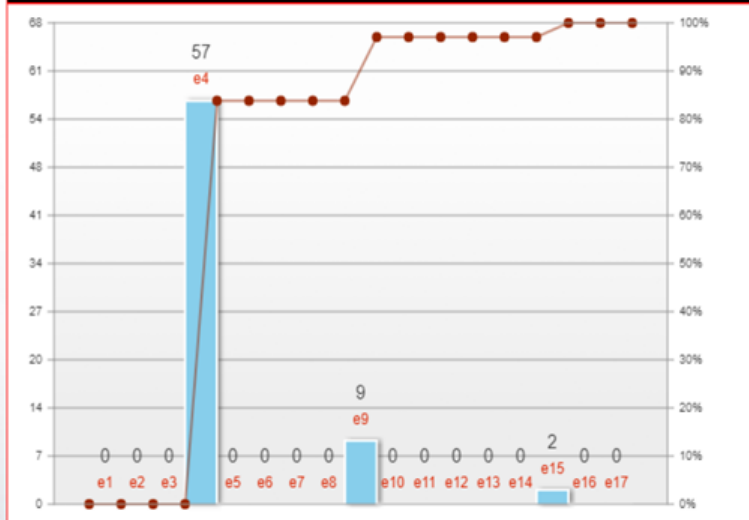
Day Week Previous Next



LEAD DEFECTS



DEFECT CATEGORY - PARETO CHART



- Legend**
- e1 : Post Trim Contamination
 - e2 : Not to drawing requirements
 - e3 : Gel Spots
 - e4 : Time/Temperature
 - e5 : Deformation
 - e6 : Moulded Forr
 - e7 : Tears
 - e8 : Trim
 - e9 : Pin Holes
 - e10 : Damage
 - e11 : Uncured Elastomer
 - e12 : Burst Test
 - e13 : Discolor Staining
 - e14 : Flow lines
 - e15 : Fold marks
 - e16 : Leaking
 - e17 : Pre-trim Contaminator

OVERVIEW PROCESS OPERATOR DATA **DEFECT DATA** RANKING

Profile

Analysis

Summary

DATA AVAILABILITY



Press



Trim



Mould



Oven



Final Inspection

BY BATCH NUMBER

ENTER DATE RANGE

FROM

01 ▾ Aug ▾ 2017

TO

04 ▾ 00 ▾ 30 ▾ Aug ▾ 2017 06 ▾ 00 ▾

Save

Refresh

CSV

Date	Batch...	Rub S...	Opera...	Batch...	Batch...	Post T...	Not to...	Gel S...	Time ...	Defor...	Mould...	Tears	Trim	Pin H...	Dama...	Uncur...	Burst ...	Discol...	Flow ...	Fold ...	Leaking	Pre Tr...	No of ...
03-08-...	60087...	393/947	H2089...	17	20	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
06-08-...	60087...	393/947	H1349...	3 6	20	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2
02-08-...	60086...	393/947	H1095...	12	20	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
08-08-...	60087...	393/946	H1114...	15 20	20	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2
09-08-...	60087...	393/947	H1095...	8	20	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
10-08-...	60087...	393/947	H2132...	5	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
07-08-...	60087...	393/947	H1095...	19	20	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
06-08-...	60087...	393/947	H1095...	7	20	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1

BY PART NUMBER

CSV

Part No	Post T...	Not to...	Gel Sp...	Time T...	Defor...	Mould...	Tears	Trim	Pin Ho...	Dama...	Uncur...	Burst ...	Discol...	Flow L...	Fold M...	Leaking	Pre Tri...	Total ...	Total ...	Yield	Bench...	Trend
4W319...	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0.0 %	75.0 %	-
9W300...	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0.0 %	75.0 %	-
9W316...	0	0	0	19	0	0	0	0	0	0	0	0	0	0	0	0	0	19	60	68.333...	75.0 %	-
9W300...	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	3	60	95.0 %	75.0 %	+
3009W...	0	0	0	19	0	0	0	0	0	0	0	0	0	0	0	0	0	19	110	82.727...	75.0 %	+
3163W...	0	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	12	90	86.666...	75.0 %	+
3194W...	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0.0 %	75.0 %	-
1592W...	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	10	60	83.333...	75.0 %	+
1592W...	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	5	180	97.777	75.0 %	+

[OVERVIEW](#)
[PROCESS](#)
[OPERATOR DATA](#)
[DEFECT DATA](#)
[RANKING](#)

DATA AVAILABILITY



RANKING BY PART NUMBER

Getdata

CSV

Sl.No	Part Number	Pass	Fail	Count
1	94W	1163	53	1219
2	92W	1008	35	1046
3	92W	907	8	916
4	09W	790	40	831
5	92W	704	37	743
6	63W	681	32	715
7	09W	681	37	719
8	94W	361	2	366
9	94W	373	7	380

RANKING BY OPERATOR NUMBER

Getdata

CSV

Sl.No	Operator	Pass	Fail	Count
1	H109	2359	61	2425
2	E676	2048	81	2136
3	H208	1994	117	2115
4	H208	780	14	796
5	H134	710	29	740
6	H151	426	21	449
7	H109	448	28	476
8	E837	108	1	109
9	H219	121	3	124

HomePage

Press 1 ● | Press 2 ● | Press 3 ● | Press 4 ● | Press 5 ●

- Alarm
- Reports
- Recipe
- Press 1
- Press 2
- Press 3
- Press 4
- Press 5
- Labview
- Post Curing
- Oven
- Particle Counter

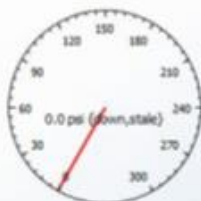
STEAM

Temperature



UL
LL

Pressure



UL
LL

Save

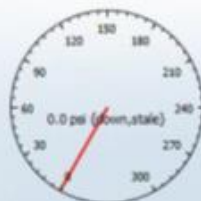
WATER

Temperature



UL
LL

Pressure

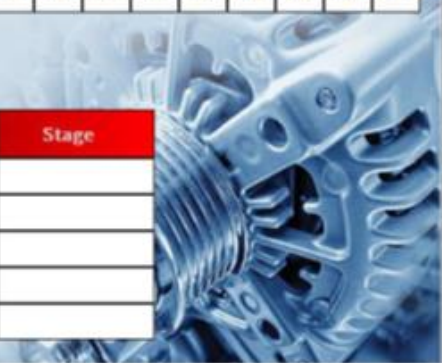


UL
LL

Hour	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Utilization	17.2	32.4	10.4	7.6	12.3	16.0	12.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Press Live Data

Press	Batch Number	Part Number	Batch Index	Stage
Press 1	-	-	0.0	
Press 2	-	-	0.0	
Press 3	-	-	0.0	
Press 4	-	-	0.0	
Press 5	-	-	0.0	



Press 1  |
 Press 2  |
 Press 3  |
 Press 4  |
 Press 5 

Recipe Management

Activity Log

Search Recipe:

General

Material Name: Part No.: Diameter: Description: NGPS: HeatingOnTime:

Temperature

LL (-)	Actual (°C)	UL (+)
145.00	150.00	155.00

Time

LL (-)	Actual (s)	UL (+)
80.00	300.00	1999.00

Pressure

LL (-)	Actual (s)	UL (+)
0.80	2.00	3.00

Dwell

LL (-)	Actual (°C)	UL (+)
145.00	150.00	155.00

LL (-)	Actual (s)	UL (+)
100.00	200.00	300.00

Ramp Down

LL (-)	Actual (°C)	UL (+)
45.00	48.00	50.00

LL (-)	Actual (s)	UL (+)
60.00	60.00	1999.00

LL - Lower Limit | UL - Upper Limit

Oven Specifications

Temperature





LL (-)	UL (+)
0.00	0.00

Time

LL (-)	UL (+)
+00000h 00m 00s	+00000h 00m 00s

Recipe Manager

252 objects

Name	Material Name	Part No	Diameter	Description	Steam Cut Off Time	Pressure Multiplier	Ramp up Temperature upper limit	Ramp up Temperature	Ramp u
 Rec_3009W120	Cat U2000570	3009W120	4.00	NGPS 127	137.00	0.00	155.00	150.00	145.00
 Rec_3331W090	Cat U2700610	3331W090	5.00	NGPS 127	137.00	0.00	155.00	150.00	145.00
 Rec_3194W774	Cat U2000570	3194W774	4.00	NGPS 127	137.00	0.00	155.00	150.00	145.00
 Rec_77300861_4001	NGPS1145	77300861-4001	6.00	NGPS1145	95.00	0.00	120.00	115.00	105.00

Alarm

Reports

Recipe

Press 1

Press 2

Press 3

Press 4

Press 5

Labview

Post Curing

Oven

Particle Counter

Reports

Batch Number | **Part Number**

 Part No.

1592W233

 Time

 Start Date


 End Date


Sl No	Timestamp	Part Number	Batch Number	Batch Index	Press Number	Pass Fail	Notes	Export
3	07-Mar-17 5:16:26 AM GST	1592W233	6007984669	19	1	PASS		OE12826/00
4	07-Mar-17 9:09:21 AM GST	1592W233	6007988196	4	1	PASS		OE12826/00
5	07-Mar-17 8:15:47 PM GST	1592W233	6007988196	7	1	PASS		OE12826/00
6	07-Mar-17 9:05:37 PM GST	1592W233	6007988196	8	1	PASS		OE12826/00
7	07-Mar-17 9:53:25 PM GST	1592W233	6007988196	9	1	PASS		OE12826/00
8	07-Mar-17 10:30:45 PM GST	1592W233	6007988196	10	1	PASS		OE12826/00
9	07-Mar-17 10:56:01 PM GST	1592W233	6007988196	11	1	PASS		OE12826/00
10	08-Mar-17 1:20:18 AM GST	1592W233	6007988196	14	1	PASS		OE12826/00
11	08-Mar-17 1:52:31 AM GST	1592W233	6007988196	15	1	PASS		OE12826/00
12	08-Mar-17 3:59:35 AM GST	1592W233	6007988196	18	1	PASS		OE12826/00
13	08-Mar-17 6:14:44 AM GST	1592W233	6008021806	1	1	PASS		OE12826/00
14	08-Mar-17 6:38:28 AM GST	1592W233	6008021806	2	1	PASS		OE12826/00
15	08-Mar-17 7:30:02 AM GST	1592W233	6008021806	4	1	PASS		OE12826/00
16	08-Mar-17 7:57:14 AM GST	1592W233	6008021806	5	1	PASS		OE12826/00
17	08-Mar-17 9:02:50 AM GST	1592W233	6008021806	6	1	PASS		OE12826/00
18	08-Mar-17 1:42:45 PM GST	1592W233	6008021806	10	1	PASS		OE12826/00
19	08-Mar-17 2:21:22 PM GST	1592W233	6008021806	11	1	PASS		OE12826/00

Station 3 - Final Inspection

Operator Data Entry

Alarm

Reports

Station 1

Station 2

Station 3

Oven

Operator No. Part Number Batch Number Batch Index Cage Number Notes BATCH COMPLETE

Defects

- | | |
|--|---|
| <input checked="" type="checkbox"/> Pin Holes | <input checked="" type="checkbox"/> Damage |
| <input checked="" type="checkbox"/> Pre-Trim Contamination | <input checked="" type="checkbox"/> Tears |
| <input checked="" type="checkbox"/> Indentation marks / Porosity | <input checked="" type="checkbox"/> Fold Lines |
| <input checked="" type="checkbox"/> Post Trim Contamination | <input checked="" type="checkbox"/> Leaking |
| <input checked="" type="checkbox"/> Burst Test | <input checked="" type="checkbox"/> Deformation |
| <input checked="" type="checkbox"/> Gelspots | <input checked="" type="checkbox"/> Not to Drawing Requirements |
| <input checked="" type="checkbox"/> Moulded Form | <input checked="" type="checkbox"/> Uncured Elastomer |
| <input checked="" type="checkbox"/> Trim | <input checked="" type="checkbox"/> Discolorstaining |
| <input checked="" type="checkbox"/> Fold Marks | |

Result

Data Submitted..

Save Data

Clear

Clear All

Timestamp	Part No	Batch Index	Gelspots	Notdrawingreq	Batchcomplete	Refresh
20-Sep-17 12:44:03 PM GST	3194W340	8	false	false	true	
26-Sep-17 1:11:14 PM GST	3194W340	8	true	true	true	
26-Sep-17 1:13:59 PM GST	3194W340	1	false	false	false	
26-Sep-17 2:16:35 PM GST	3194W340	1	false	false	false	

Process Plant Automation

🏠 | 🔔 | 02-Oct-17 7:03 PM GST

Station 1 🟢 | Station 2 🟢 | Station 3 🟢

Oven

Alarm

Reports

Station 1

Station 2

Station 3

Oven

Oven 1 🔴

Alarm Time

Temperature
203.3

Oven Running

Oven 2 🔴

Alarm Time

Temperature
0.0

Oven Off

Oven 3 🔴

Alarm Time

Temperature
0.0

Oven Off

Oven 4 🔴

Alarm Time

Temperature
0.0

Oven Off

Operator No.

Part No.

Batch No.

Cage No.

START

STOP

Actual Time

0.0

Save Data

Reset Oven

Clear

Recipe Limits

	MIN	MAX
Spec Time	+000000h 01m 05s ⚙️	+000000h 02m 00s ⚙️
Temperature	<input type="text" value="195.00"/>	<input type="text" value="205.00"/>

Save

Summary

Solution Summary

- Discrete manufacturing plants are similar to buildings
 - Lots of diverse data sources
- Niagara community's offerings fit in manufacturing plants
 - Hardware
 - Integration
 - Forms
 - UI



Q&A

Niagara Framework Supporting Industry 4.0

- It's one of the largest IoT markets and presents immediate growth opportunities for Niagara partners
- Our experience has delivered significant savings for industrial customers
- We need you to scale out what we've incubated
- We're here to help you get started.

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- sajaad@iotdots.net