NOVA Chemicals
Polyethylene

Improving Rotomolded Part Performance Through Effective Quality Programs

For the Association of Rotational Molders, 2017

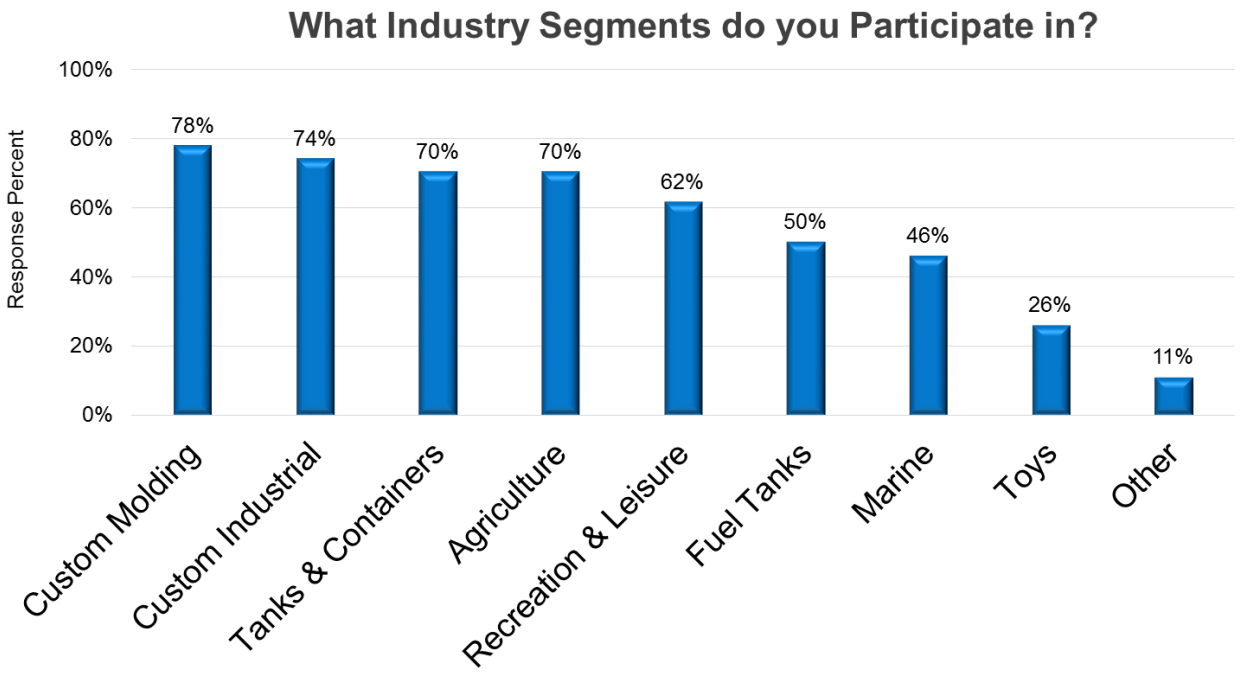
Céline Bellehumeur

September 26-28, 2017

Chicago, IL

First Things First…

… Thank you to all who participated to the survey (26 respondents)



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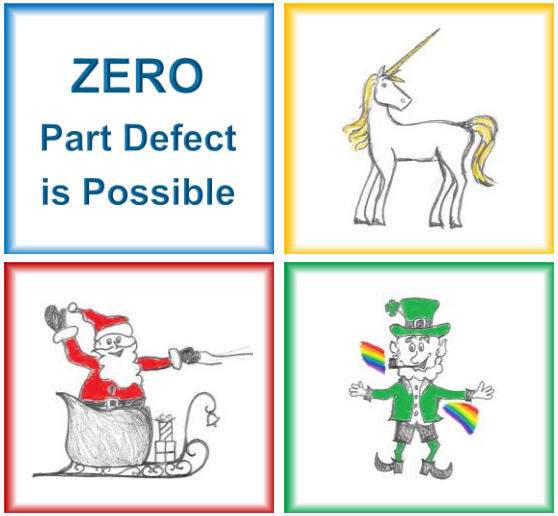
TOPICS

1. **Why Invest in Quality?**
2. **Principles and Methodologies**
3. **Using Quality Data in Problem Solving**
4. **Case Studies**
   - *Quality Story from a Custom Rotational Molder*
   - *Most Frequent & Costly Problems*



Only ONE is REAL…

Why Invest in Quality?

Benefits of a Quality Program

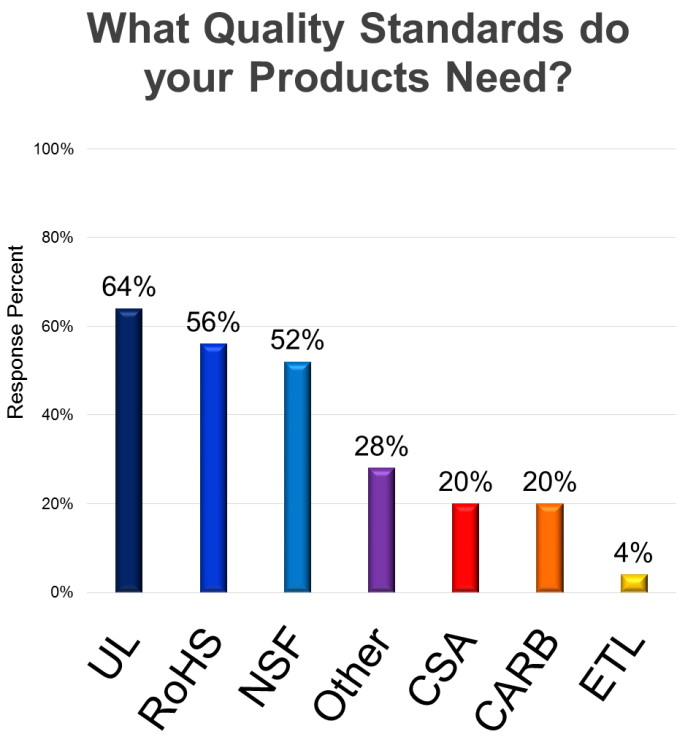
Meet customer requirements

Meet necessary **statutory and regulatory requirements**

Work in a **more efficient way**

Identify and address risks associated with your organization

Expand into new markets



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Cost of Quality

TOPICS

1. Why Invest in Quality?
2. **Principles and Methodologies**
3. Using Quality Data in Problem Solving
4. Case Studies

ISO Quality management Principles (2015)
ISBN 978092-67-10650-2

Principles and Methodologies

1. **Customer focus**
   - Identify and understand customer needs
   - Communicate needs throughout your organization

   Plan, ***Design***, ***Develop***, ***Produce***, and ***Deliver*** towards these needs

2. **Leadership**
   - Establish unity of purpose and direction at <u>all levels</u> in the organization

3. **Employee Engagement**
   - Importance of contribution and collaboration
   - Empower to take initiatives without fear
   - Recognize learning and improvement

Principles and Methodologies

4. Improvement Objectives

- Establish objectives at all levels of the organization
- Implement improvement projects
- Track, review and audit

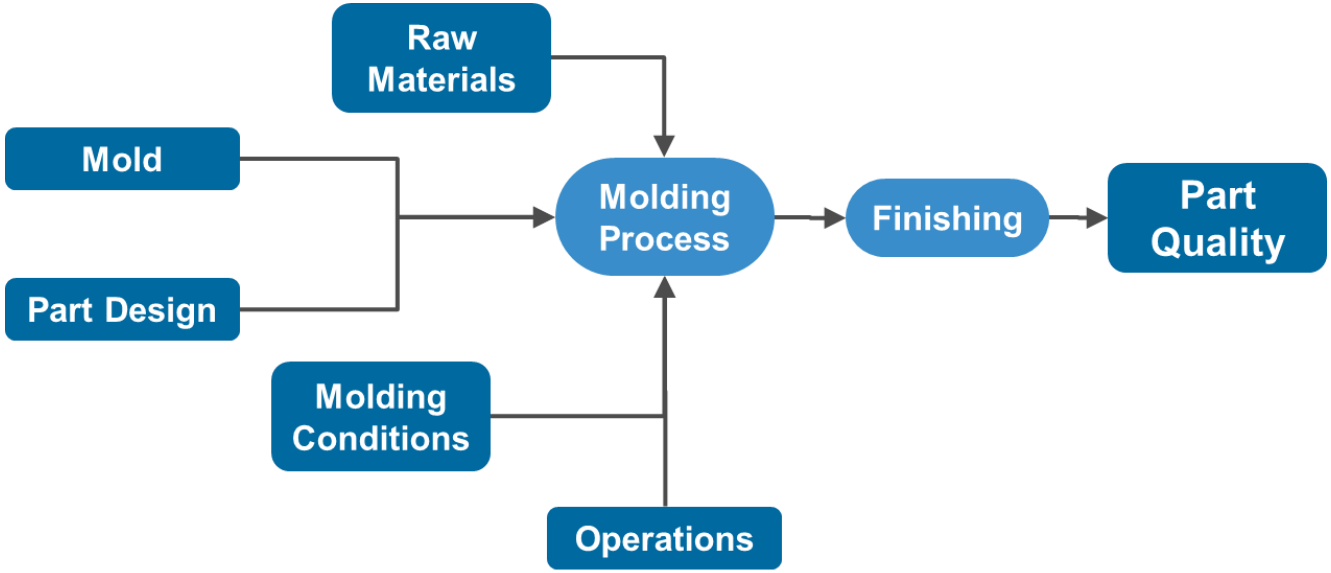
Quality Principles and Methodologies

5. Process Approach

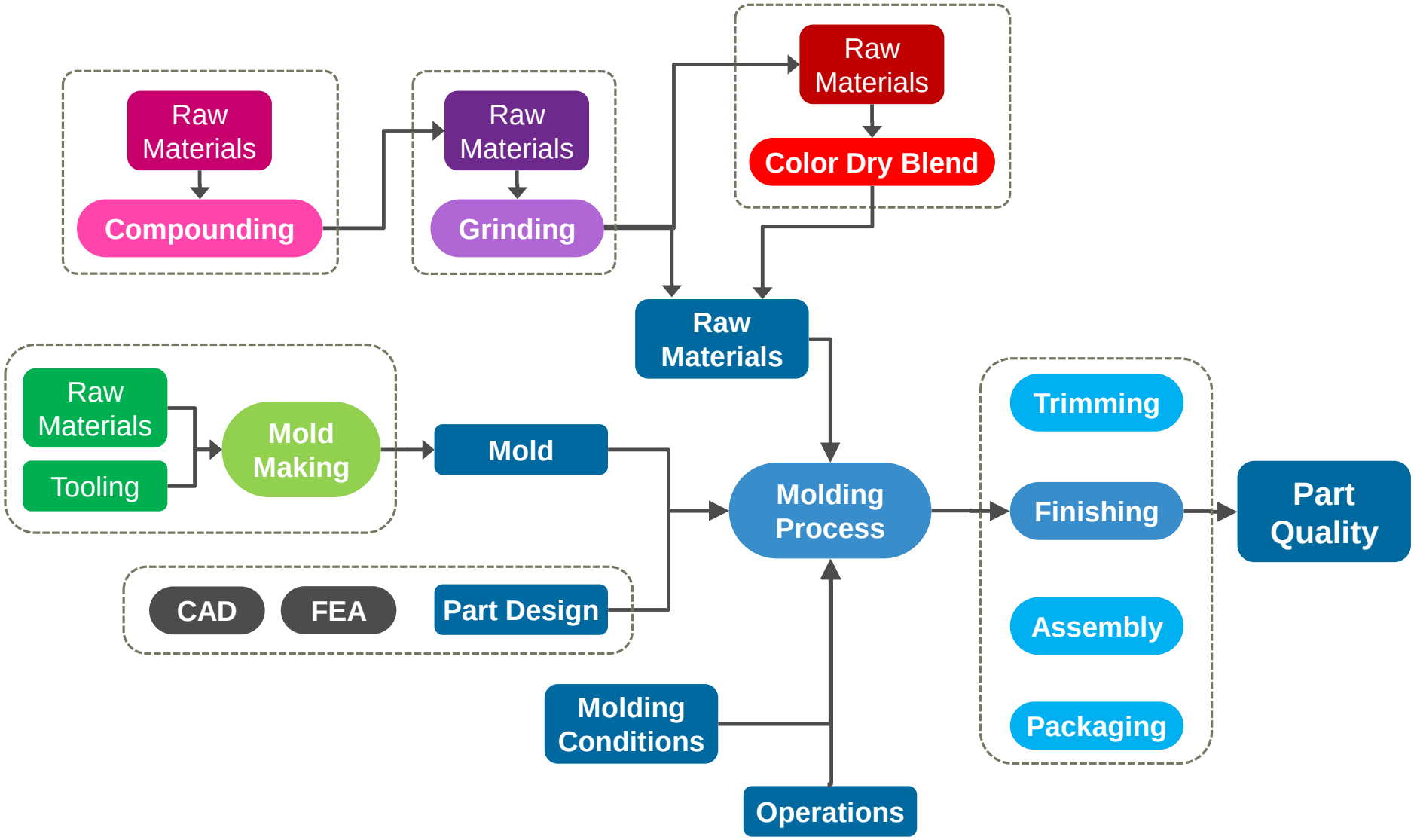
A quality management system consists of inter-related processes

- Determine process inter-dependencies
- Ensure information is available to operate and improve processes

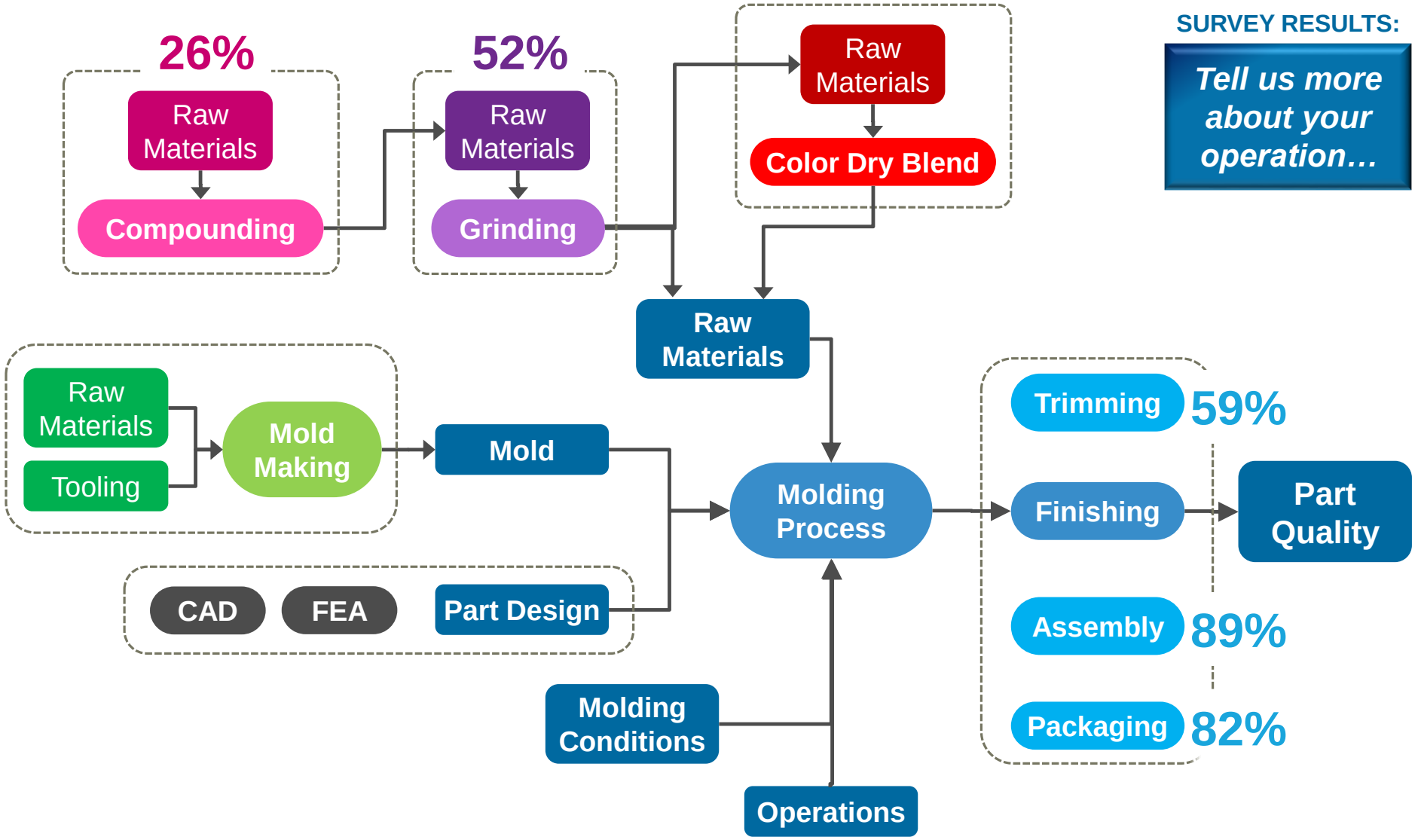
  Monitor**, **Analyze** and **Evaluate Performance



Quality Principles and Methodologies

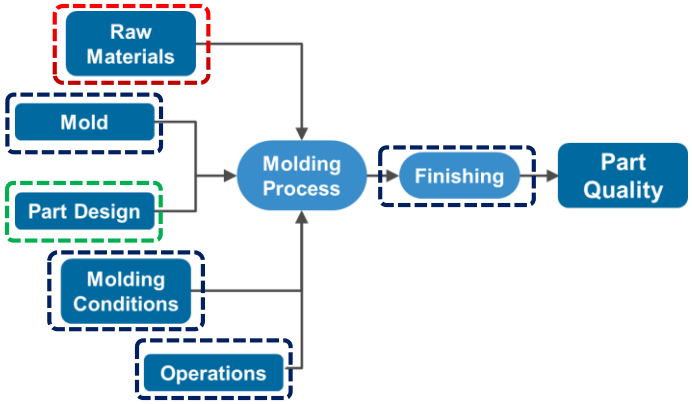


Quality Principles and Methodologies



Quality Principles and Methodologies
SURVEY RESULTS

Aspects of the process that are most important for part quality:



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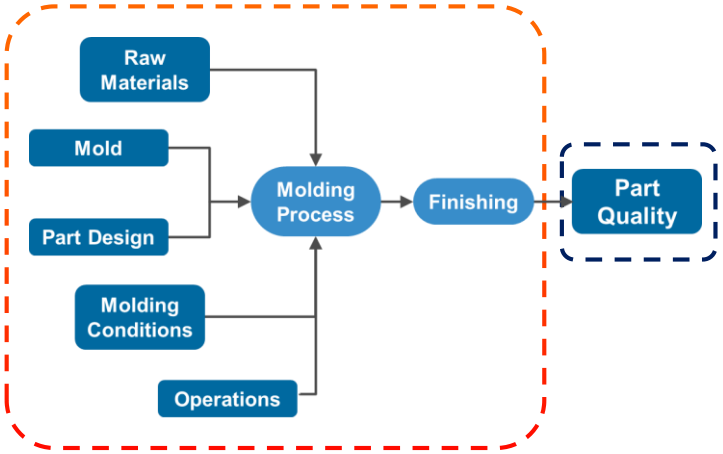
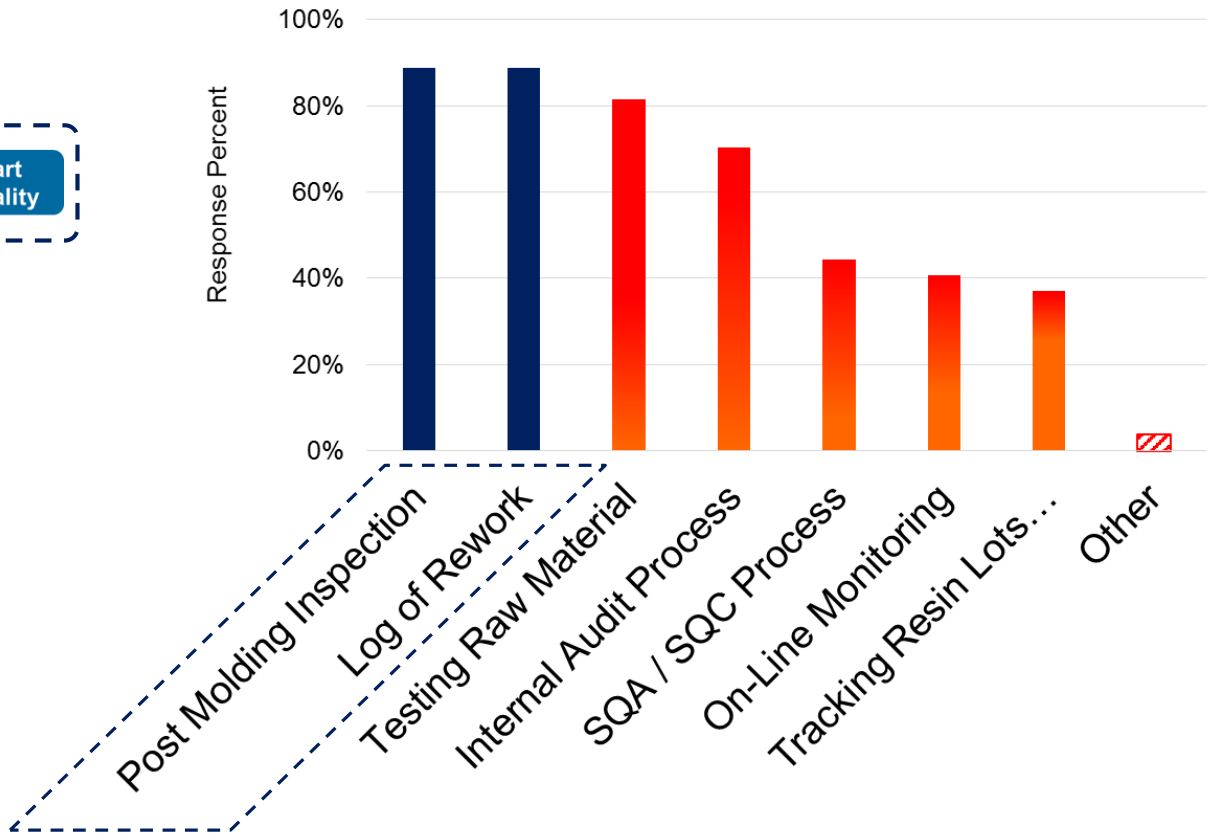
Quality Principles and Methodologies
SURVEY RESULTS

How do you track quality of products and processes?

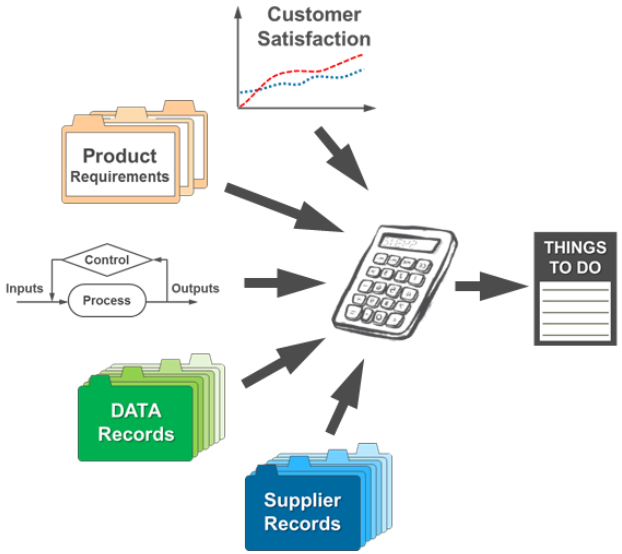




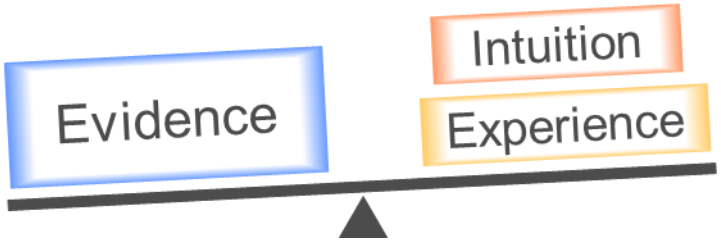
Quality Principles and Methodologies

6. Evidence-Based Decision Making

- ***Identify***, ***Measure*** and ***Monitor*** key quality indicators
- Ensure that data is sufficiently accurate, reliable and secure
- Analyze and evaluate data using suitable methods



Decisions and Actions:

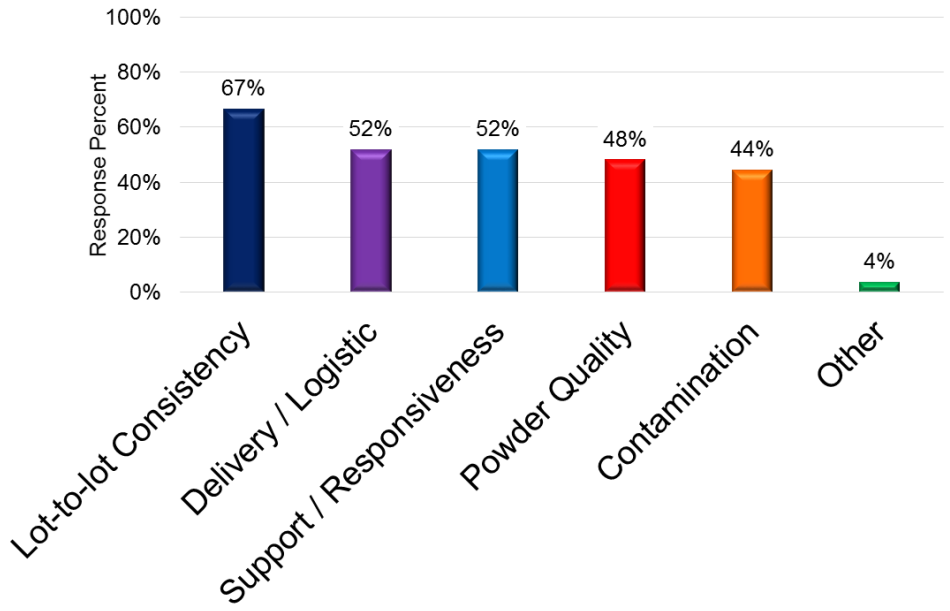


Quality Principles and Methodologies

7. Relationship Management

- Establish collaborative development activities
- Share resources, competence and quality related risks
- Prioritize relationships: short-term versus long term considerations

Most Important Issues when dealing with Resin Suppliers:



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3. **Using Quality Data in Problem Solving**
4. Case Studies

Using Quality Data in Problem Solving

Data Analysis Tools

- Cause and Effect Analysis
- Pareto Diagrams
- Statistical Quality Analysis / Control

Using Quality Data in Problem Solving

Data Analysis Tools

- **Cause and Effect Analysis**
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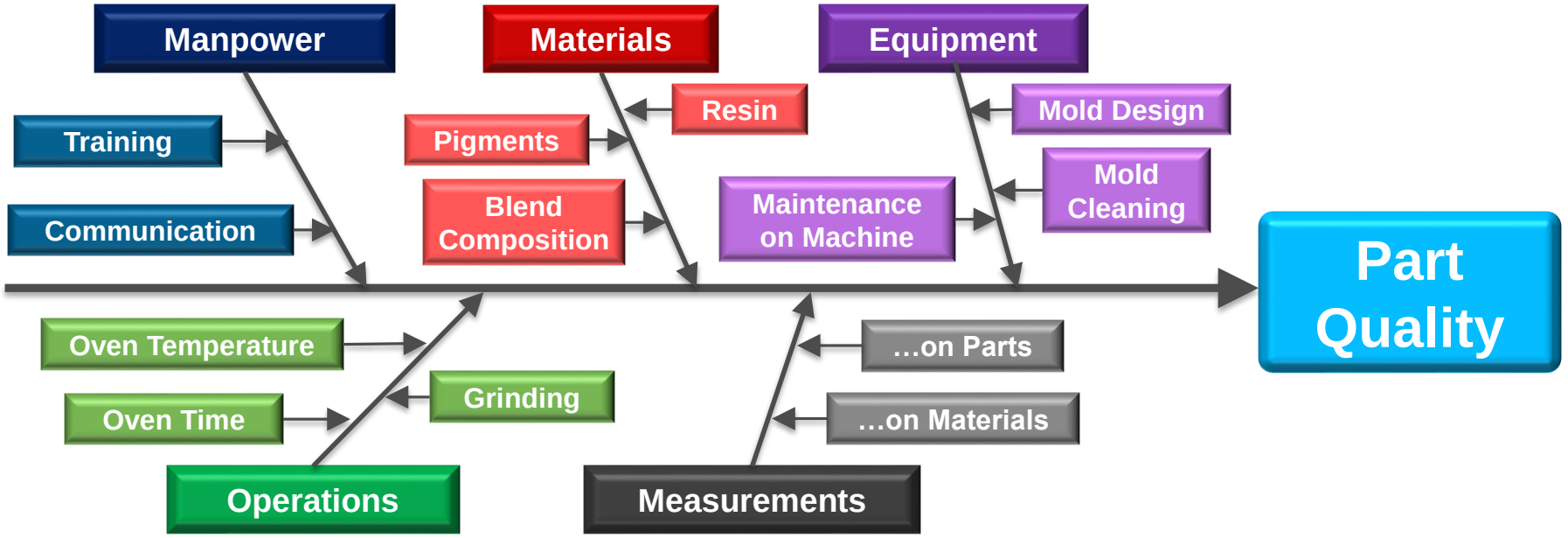

Using Quality Data in Problem Solving

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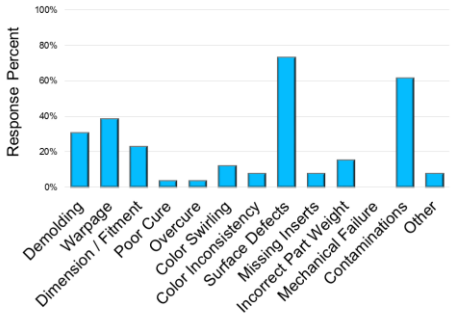
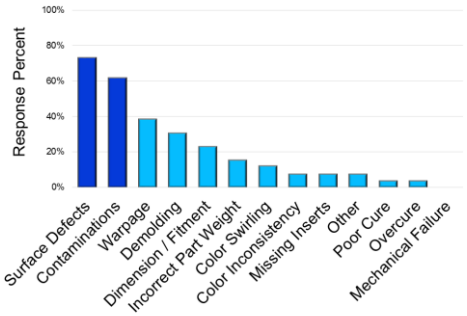
- Statistical Quality Analysis / Control



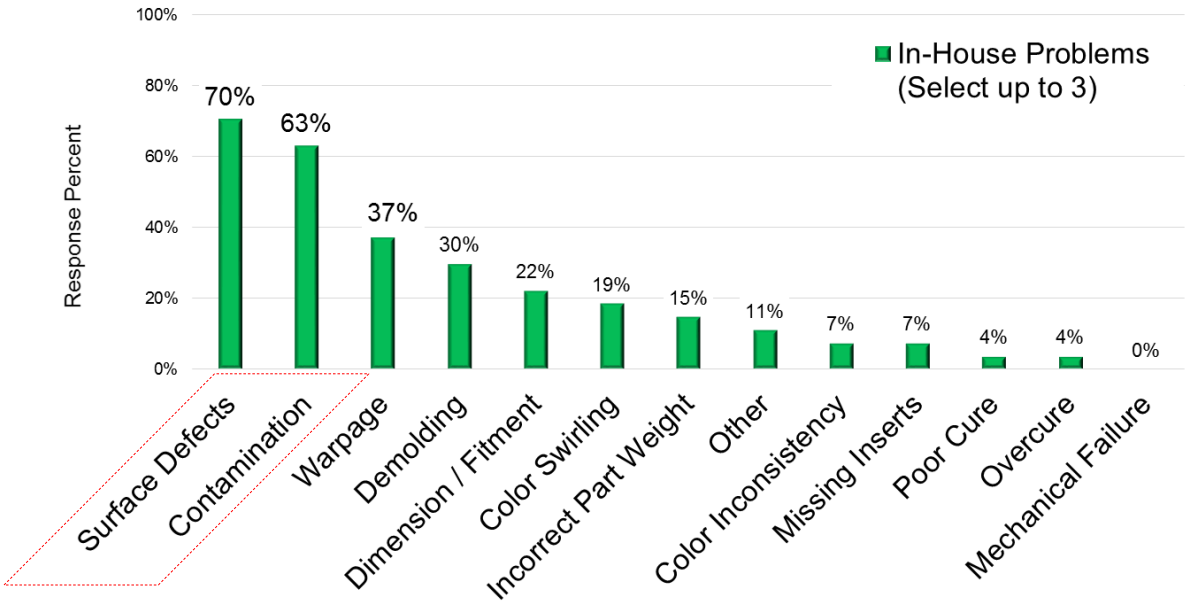
SORT DATA

Cost
Frequency



Using Quality Data in Problem Solving
SURVEY RESULTS

Problems Most Commonly Faced with your Products:

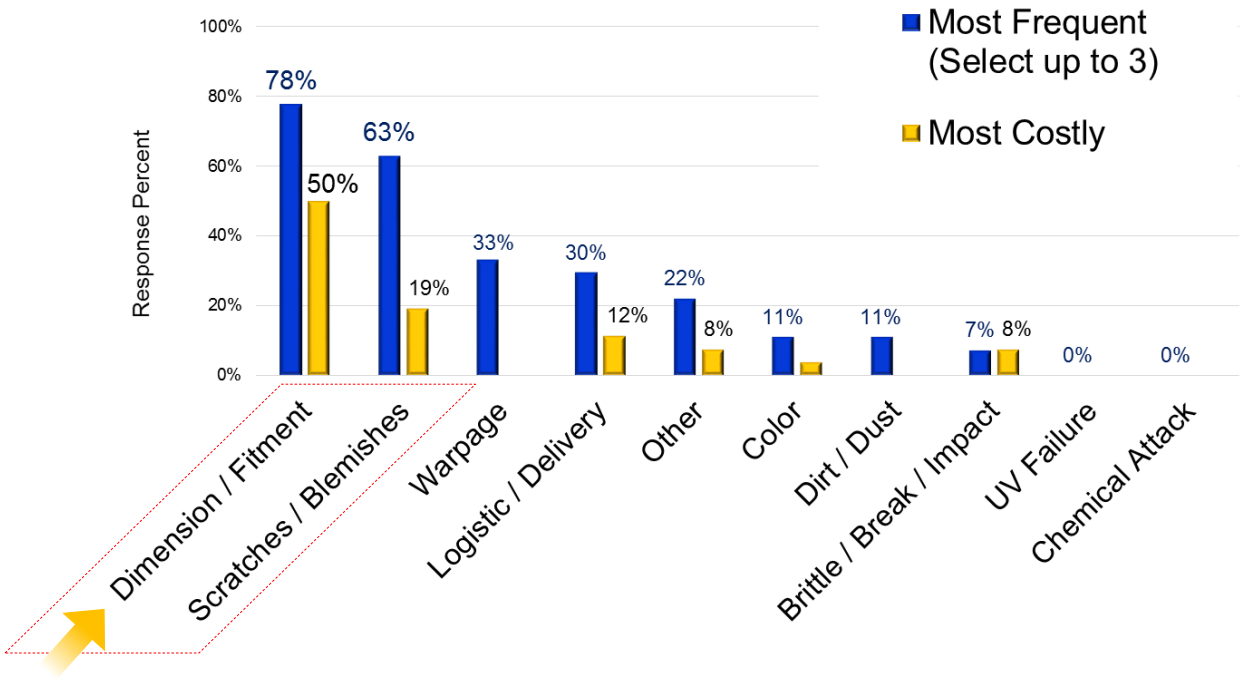


Most Common Problems:

- Surface Defects
- Contamination

Using Quality Data in Problem Solving
SURVEY RESULTS

Complaints you get from your Customers:



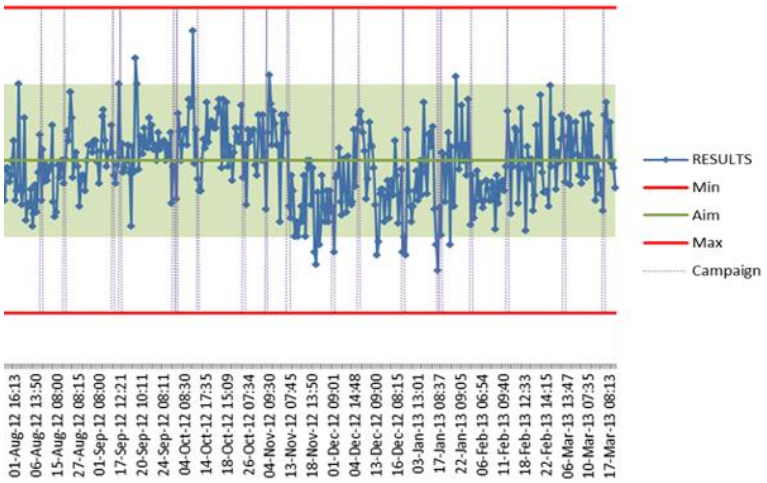
Most Frequent and Costly Complaints:

- Dimension / Fitment
- Scratches / Blemishes

Using Quality Data in Problem Solving

Data Analysis Tools

- Cause and Effect Analysis
- Pareto Diagrams
- **Statistical Quality Analysis / Control**



Systematic cause of error

Scatter data points outside control limits

- Design
- Choice of material
- Operating conditions

Special cause of error

Numerous data points outside control limits

- Lack of training
- Poor lot of incoming material
- Equipment out of order

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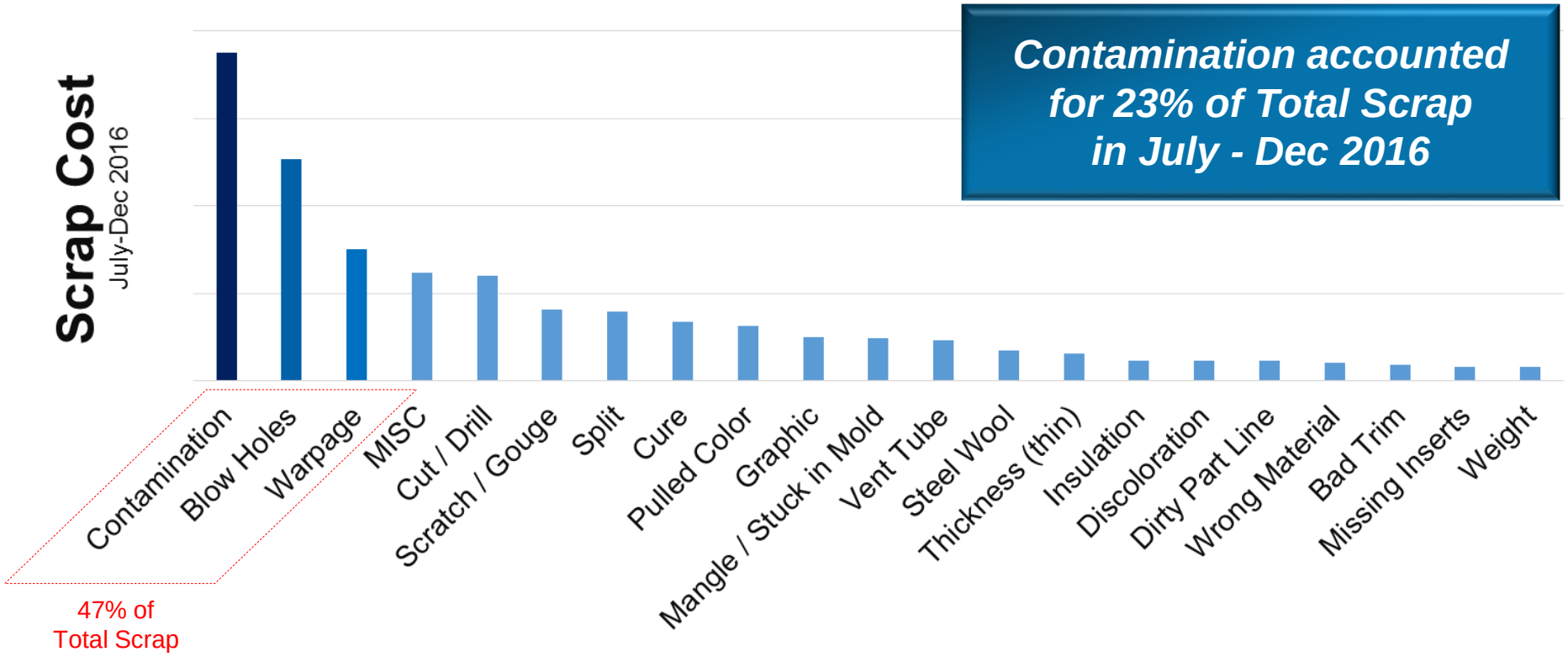
Quality Story on Contamination (Forté Products)

Discussion on Most Frequent & Costly Problems

Case Study on Contamination

1. Problem Statement
2. Key Factor Identification
3. Counter-Measure Activities

Forté Products



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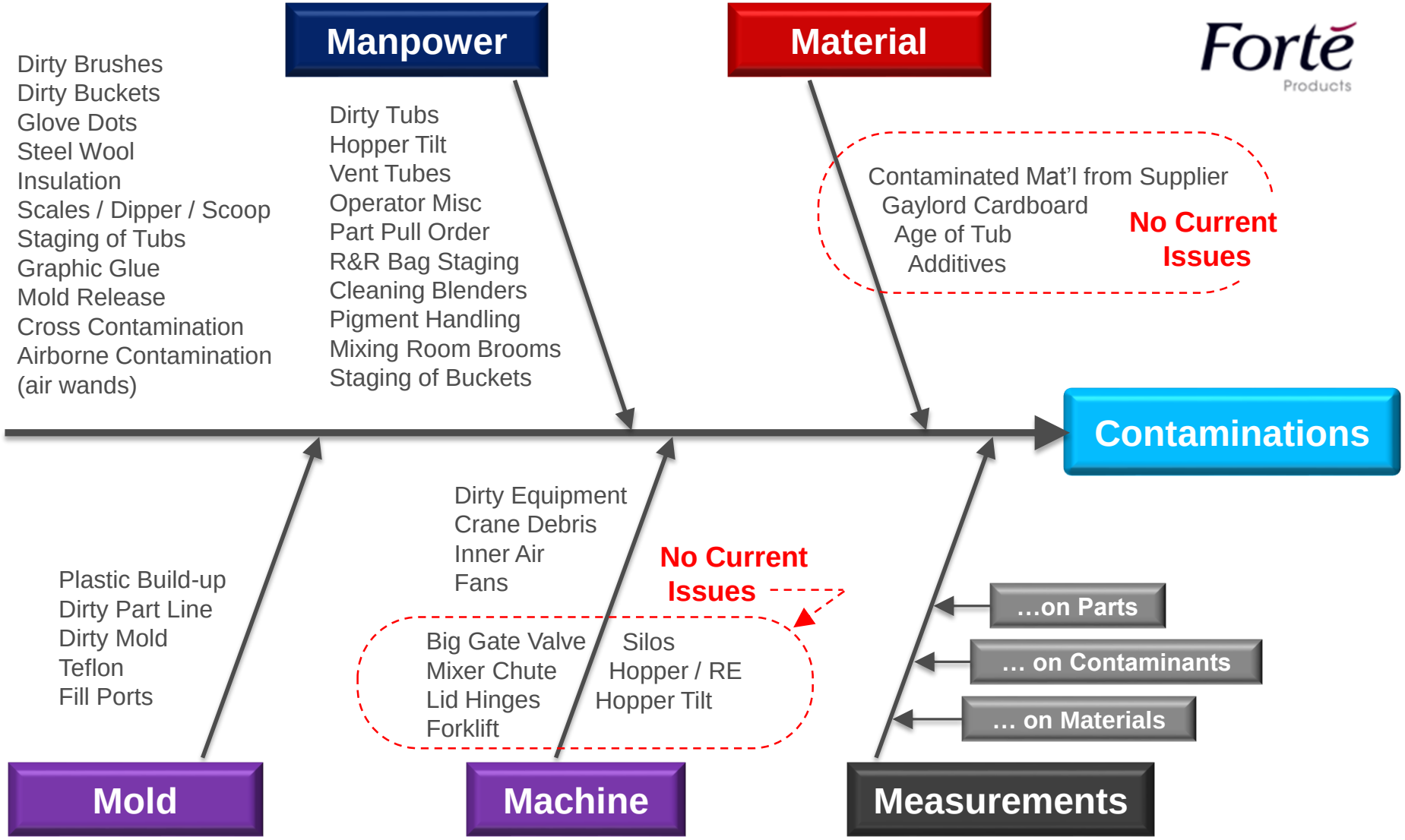
Case Study on Contamination
KEY FACTOR IDENTIFICATION



Case Study on Contamination
COUNTER-MEASURE ACTIVITIES

Forté Products

Housekeeping

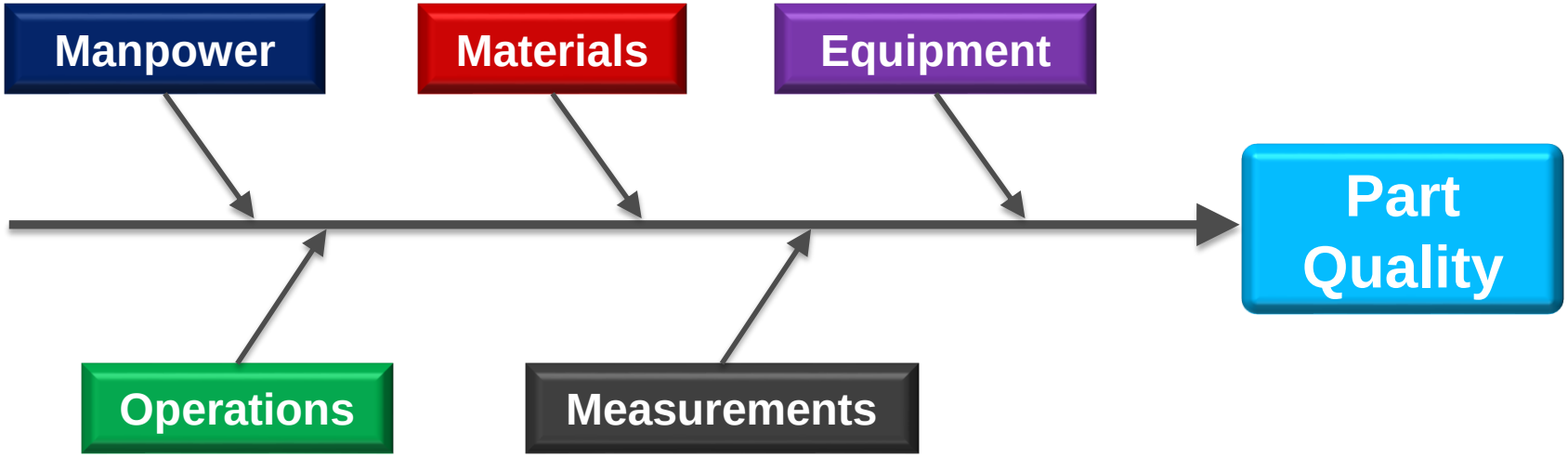
- Review 5S Checklists
  Deck, Assembly, Materials
- Review Deck Audits
- Review Maintenance PM Schedule
- Review Blow Down Schedule
- 5S of Equipment
  Impacts, Tools, Air Lines, Saws, Fixtures

Processes

- Material Staging
- Bucket Staging
- Part Pull Order
- Graphic Application
- Steel Wool / Insulation Vent Tube Packing
- Mold Release Application
- Review Roto 101 Training (Process Related Items)
- Review New Hire Orientation (Housekeeping)

Case Studies – DISCUSSION

1. Possible Causes
2. What to Monitor, How and How Frequently
3. Counter-Measure Activities



Concluding Remarks

Why Focus on Quality?

Meet customer requirements

Reduce costs

Drive growth (price advantage, market share)

Inspection, while necessary, is not the answer to quality improvement.

Quality programs require organization-wide effort, long-term commitment, and investment in training.

Involvement and leadership of top management are essential to establish a culture of quality.

Quality comes first… Schedules are secondary.

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