

Improving Color Consistency Through Supplier Quality Management and Objective Process Control

Executive Summary

Color consistency is a critical quality requirement in architectural facade, railing, and building envelope manufacturing. Variations between touch-up paints, powder-coated components, and approved customer samples can result in customer complaints, site NCRs, costly rework, and project delays.

I led the development and implementation of a standardized color management process that transformed color approval from a subjective visual assessment into a controlled, data-driven quality system. Through supplier collaboration, Incoming Quality Control (IQC), X-Rite spectrophotometer validation, and standardized approval workflows, the organization improved color consistency, strengthened supplier accountability, and contributed to an approximately 40% reduction in appearance-related NCRs and customer complaints.

Business Environment

- Architectural facade and railing manufacturing
 - Commercial and residential construction projects
 - Multiple paint and coating suppliers
 - Strict customer appearance requirements
 - High cost of field corrections and replacements
 - Cross-functional coordination between Quality, Production, Engineering, Purchasing, Suppliers, and Customers
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Business Challenge

The organization experienced recurring challenges related to color matching between:

- Powder-coated components
- Touch-up paints
- Customer-approved samples
- Supplier production batches

These inconsistencies created:

- Customer complaints
- Appearance-related NCRs
- Product rejection risk
- Repainting requirements
- Supplier disputes
- Project delays
- Increased operational costs

Color approval relied primarily on visual assessment, making decisions subjective and inconsistent between departments. Different individuals often reached different conclusions regarding acceptance criteria, creating uncertainty and inconsistent quality outcomes.

Root Cause Analysis

A structured review of historical complaints, supplier processes, customer feedback, and internal quality controls identified several contributing factors.

Investigation Methods

- Complaint Trend Analysis
- Supplier Batch Reviews
- Process Mapping
- Gemba Observations
- Incoming Material Assessment
- Quality System Review

Key Findings

No Standardized Incoming Quality Control Process

Touch-up paints and color-sensitive materials were accepted without formal verification requirements.

Subjective Evaluation Methods

Color acceptance relied heavily on human judgment rather than measurable standards.

Supplier Variation

Differences between production batches created inconsistent color performance.

Limited Accountability

No structured process existed to monitor and evaluate supplier color consistency.

Inconsistent Sample Preparation

Testing methods varied between evaluations, reducing repeatability and increasing decision variability.

Improvement Strategy

The objective was to create a repeatable, measurable, and supplier-controlled color management system.

The strategy focused on:

1. Standardizing color verification procedures.
2. Eliminating subjective approval methods.
3. Introducing objective measurement technology.
4. Improving supplier accountability.
5. Preventing appearance-related defects before production release.
6. Creating a documented customer approval workflow.

Solution Implemented

1. Incoming Quality Control (IQC) Process

Developed and implemented a structured Incoming Quality Control procedure for all touch-up paints and color-sensitive materials.

Materials could not be released until quality verification requirements were successfully completed.

2. Standardized Sample Preparation

Created documented procedures covering:

- Surface preparation
- Spray application methods
- Drying requirements
- Environmental conditions
- Testing standards
- Evaluation criteria

This ensured repeatable and consistent evaluations.

3. X-Rite Spectrophotometer Validation

Implemented objective color measurement using X-Rite spectrophotometer technology.

Benefits included:

- Digital color verification
- Repeatable measurement standards
- Reduced human bias
- Objective pass/fail decisions
- Improved traceability
- Improved supplier accountability

Color performance was validated against approved standards using measurable acceptance criteria.

4. Supplier Quality Governance

Established supplier performance monitoring and approval controls including:

- Batch verification
- Supplier performance reviews
- Corrective action requirements
- Escalation procedures

- Supplier accountability measures

This significantly improved supplier ownership of quality performance.

5. Customer Approval Workflow

Developed a structured approval process involving:

- Supplier sample submission
- Internal quality review
- Customer sign-off
- Documentation retention
- Production release authorization

This improved communication, reduced approval delays, and minimized disputes.

Quantified Business Impact

Performance Area	Before	After
Color Verification	Subjective Visual Assessment	Objective & Measurable
Supplier Accountability	Limited	Structured Governance
Inspection Consistency	Variable	Standardized
Appearance-Related NCRs	Recurring	Reduced by Approximately 40%
Customer Complaints	Frequent	Significantly Reduced
Rework Risk	High	Reduced
Production Release Confidence	Limited	Increased

Business Benefits

Improved Product Quality

Objective measurement improved consistency across suppliers and production batches, contributing to an approximately 40% reduction in appearance-related NCRs.

Reduced Rework Costs

Potential color mismatches were identified before production release, minimizing repainting, replacement requirements, and field corrections.

Stronger Supplier Performance

Data-driven evaluation improved supplier accountability, responsiveness, and overall quality ownership.

Better Customer Experience

Standardized approvals reduced disputes, improved confidence in delivered products, and significantly reduced customer complaints related to color consistency.

Improved Operational Efficiency

Objective acceptance criteria reduced uncertainty and accelerated decision-making.

Cross-Functional Leadership

This initiative required coordination across:

- Quality Assurance
- Production
- Engineering
- Purchasing
- Supplier Representatives
- Operations Management
- Customers

The project successfully aligned internal requirements, supplier expectations, and customer approval standards while creating a sustainable quality management framework.

Sustainability Measures

To ensure long-term success, the following controls were implemented:

- Incoming Quality Control procedures
 - Standardized testing methods
 - X-Rite verification standards
 - Supplier performance monitoring
 - Quality release gates
 - Corrective action requirements
 - Documented approval workflows
 - Periodic quality audits
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Leadership Lessons Learned

Science Outperforms Subjectivity

Objective measurement systems provide significantly greater reliability than visual assessment alone.

Quality Must Begin at the Source

Supplier quality verification is most effective when performed before materials enter production.

Data Drives Accountability

Measured performance creates stronger supplier ownership and faster resolution of quality concerns.

Prevention Is More Effective Than Correction

Identifying quality concerns before production release eliminates costly downstream failures.

Conclusion

This project transformed the organization's color management process from a subjective approval system into a standardized, data-driven supplier quality framework. Through Incoming Quality Control, X-Rite validation, supplier governance, and structured approval controls, the organization improved color consistency, strengthened supplier accountability, reduced appearance-related NCRs by approximately 40%, and enhanced customer satisfaction.

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Supplier Quality Management | Quality Systems | Process Control | Continuous Improvement | Operational Excellence