



A Division of **DORALCO** - *Architectural Metal Solutions*

Quality Control Guidelines

(Supplier Evaluation Procurement Control)

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Quality Manual

The purpose of this Quality Control Guideline Manual is to define the structure and operation of Doralco Company's quality control system for the fabrication of their products.

Doralco
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Intertec Division Manager
Project Manager
Quality Control Technician
Plant Division Supervisor

About

Doralco Architectural Metal Solutions specializes in innovative sunshade, grille and composite panel designs. Doralco's COMPOSITEcore and Intertec divisions create specialty façades and components to meet the needs of custom design and specific LEED requirements. Our design team has been helping Architects design their dream buildings for over 23 years with our free design assist service.

COMPOSITEcore Architectural Cladding Systems

- Rainscreen Systems
- Wet Joint Systems
- Composite and Plate Panels

Intertec Sunshades

- Vertical Sunshades
- Airfoil Sunshades
- Eggcrate Grille Sunshades
- Perforated Sunshades
- Radiused Sunshades
- Lightshelves
- Trellises

Intertec Grilles

- Airfoil Screenwall Grilles
- Architectural Incline Grilles
- Straightline/Eggcrate Grilles
- Lattice Grilles
- Medallion Grilles
- Perforated Grilles

All of Doralco's products are designed to meet the most stringent design criteria and are a 100% recyclable. Our exterior architectural systems and accessories are designed create a bold and unique look every time. It's the reason why the world's greatest architects and designers call on us to fabricate their masterpieces.

Responsibility, Personnel and Authority

All work will be performed in accordance with the contract requirements. Intertec, a division of Doralco, will maintain an inspection system which assures compliance with the contract requirements. Any indication of system deficiencies whether discovered as a result of the subcontractor/supplier's checks and tests, will result in modifications to the system to correct these deficiencies.

This QCP does not endeavor to repeat or summarize contract requirements. It describes the process which Intertec will use to assure compliance with those requirements. The QCP documents broad categories of contract work in accordance with the specification section for Contract's Quality Control. Necessary details dealing with minor items that may be overlooked in this plan will be addressed informally between the Intertec's Quality Control Technician (QCT), installer / subcontractor's Project Manager / QCT and the Project Engineer (PE), as the work progresses; and will be documented in writing if so requested by the PE. It is understood that the level of QC accountability and control exercised by Intertec on these items will be consistent with the details of this plan.

It is the responsibility of the Division Manager to provide education to the plant and field of unfamiliar or new sunshades or grillework. This is very important to marry the design intent to fabrication, assembly and installation. Doralco's pre-installation meetings are also required to kick off new installation projects. This will be an opportunity to discuss surrounding substrate conditions and interfacing with other systems.

The Project Manager has overall responsibility for the successful completion of the project work. The project manager has had similar responsibilities on all Intertec projects.

The responsibility and authority for Doralco's Quality Management System is the Quality Control Technician - QCT. In this role he is responsible for:

- Ensuring that the processes are established, implemented, maintained and continually improved
- Overseeing day-to-day procurement and fabrication operations from a QC standpoint.
- Assure that all required fabrication and documentation are completed, and that the results are furnished to the Customer in the time frame required
- Reporting and resolving quality assurance issues from customers and third parties
- On quality assurance issues this individual reports directly to top management

(Quality Control Technician) is empowered to suspend any operations which he deems to be in noncompliance with the contract, and/or order corrective measures to assure compliance.

The (Plant Division Supervisor) reports to the (Project Manager) and (Division Manager) is responsible for the daily production operation at Doralco / Intertec.

There is a designated Lead Fabricator that report directly to the (Plant Division Supervisor) and are responsible for performing and recording quality checks. Records of these checks are recorded and maintained in the Job File.

There is also a Shipping and Receiving Supervisor that checks all finished goods, this individual also reports to the (Plant Division Supervisor).

Fabricators are responsible for performing in-process inspection checks to ensure that the product is within the acceptable standards as identified on the product specification sheets. The Receiving Handler inspects incoming materials for quantity and quality, including surface defects, proper size, and functionality where applicable. Upon inspection, discrepancies are reported immediately to the (Plant Division Supervisor) for his/her inspection. Rejected materials provided by vendors will be photographed and sent back to the vendor.

As the number of operations or their dispersion on the project starts to overextend the (Quality Control Technician), QC responsibilities will specifically be assigned to Doralco / Intertec's supervisory personnel specifically responsible for given operations.

Intertec has an experienced and highly professional staff that is used to the responsibility entailed by the QC requirements. We therefore do not anticipate any personnel or training problems in complying with them. If any such problems occur, Doralco / Intertec will take whatever actions are necessary to correct them including retraining, providing more supervision or removal of poorly functioning personnel.

Documentation Requirements

This Quality Manual, Job Shop Drawings, Cut Sheets, Fabrication Tickets and Installation Drawings are considered controlled documents within Doralco. The Quality Manual is reviewed at least annually to ensure it is current and reflects the best practices of Doralco.

Doralco has a document control system to ensure that all quality assurance documents used:

- Have been reviewed and approved prior to use
- Changes to documents are also reviewed and approved
- All obsolete documents are destroyed, or clearly marked, to prevent unintentional use

Identification and Traceability

Once the units have begun fabrication they are identified with the job register number, elevation identification as per the fabrication tickets and installation drawings. This permits traceability back to the fabrication tickets, which is retained in the job file. In addition, the job file also contains all purchase orders associated with the job, which allows traceability for all components used. If it were necessary, from the purchase order, a vendor could also trace their production.

Each unit produced by Doralco has a fabrication tickets including quality control affixed to the unit by the assembling employee. This ticket indicates the unit information of: job name, register number, and elevation, along with the QC checks, system data, vertical & horizontal sizes, with their initials.

Each job has an approved Fabrication Ticket, which follow the job throughout the production process. These documents are all retained in the job file.

Quality Audits and Inspection

Daily Quality Control audits are performed by (Quality Control Technician - OCT) to ensure all production is in accordance with the Doralco job specific Quality Control Check Sheet. Company policy states that these audits are performed randomly on 1 out of every 50 units produced. Also each unit is individually captured in a digital photograph with the identification number for a visual review.

Corrective Action Program

The Corrective Action Program established by Doralco / Intertec incorporates an immediate and intensive investigation of any and all Quality Control issues. These problems include internal issues (quality, product, or manufacturing) and customer concerns.

Upon the first detection of a quality control failure the shop employee is to notify the (QCT). The (QCT) will notify (Project Manager) and (Division Manger) for an immediate investigation will begin. Production will be brought to a halt, until a unanimous decision is made on the reason / location of the failure. At this time production can resume on prior processes to the point of the error. The five previous unit units produced will incur the same quality control review, upon which the failed unit experienced.

Quality control issues that involve a vendor or product manufacturer will be immediately be reported to the (Quality Control Supervisor). Rejected materials provided by vendors will be photographed and sent back to the vendor. The (Quality Control Supervisor) will contact (Project Manager), upon which the findings will be resolved with that vendor or product manufacturer.

Material Inspection

Extrusions

1. Verify received material to purchase order.
2. Verify material's quantity, size, shape and color.
3. Straightness of 1/16" is required within 48".
4. Dents and scratches are not acceptable.

Sheetmetal

1. Verify received material to purchase order.
2. Verify material's quantity, size, thickness, finish.
3. Dents, dings and scratches are not acceptable.
4. Visually verify materials flatness.
5. Verify strippable film masking.
6. Verify skid packaging, shipping and handling.

Fasteners

1. Validate hardware for compliance with contract documents and drawings, including engineering documents.
2. Confirm quantity, size, and type against purchase order and fabrication documents.

Production Procedure

Once Intertec has guaranteed dimensions or field dimensions, the procurement of fabrication tickets begins. The drafting department takes the shop drawings and modifies them to the approved dimensions, adds unit tags and method of installation, and these documents become "installation drawings." From these installation drawings, each individual unit receives a fabrication ticket graphically showing the method of assembly. Each person that performs a task in the "process" column must initial in the "checked by" column. The responsibilities are as follows:

Programming:

- CADD Dimensions: The specific drafting department personal assigned to the project isolates individual units from approved shop drawings and creates an independent drawing based on the attachment details, engineering, and dimensions of the units.
 - Confirm brackets, outriggers and/or banding bar type. (Machined Parts)
 - Confirm infill and fascia quantity, size and type.
 - Confirm authorization to commence fabrication sign-off.
 - Confirm production release with PM.
 - Verify plant material.
- Shop/ Fab Release: Project Manager reviews and approves all fabrication tickets to assure that all relevant information to the fabrication of the individual unit is noted on the fabrication ticket. The machine programmer / operator then inputs the required programs to the CNC machine. The PM delivers the fabrication ticket(s) to the shop for production.
 - Verify fabrication tickets with approved shop drawings.
 - Confirm area of release and quantities required.
 - Verify amount of Machined Parts vs. fabrication tickets.

Machining:

- Machine Check: Before machining may begin, the CNC machine operator must perform an inspection of components. All system components must be operating correctly before work may proceed.
 - Verify operation of machining heads.
 - Confirm / replace accordingly.
 - Verify operation of coolant systems.

- Dimension Check: After the CNC machine produces the Machined Parts out of the raw material, he verifies the dimensions to ensure that the parts that were machined correctly.
 - Confirm that material is correct size and thickness.
 - Verify overall part height, length, and layout dimensions.
 - Inspect component parts for size with 1/16" maximum deviation
 - Visually inspect finish. Scratches and other visual defects must not be visible from a distance of 10'.
 - Inspect all material surfaces and edges for any damages or blemishes.
- Identification – Staging: The CNC operator labels the parts and delivers it to the staging area.
 - Label job register number, elevation identification as per the fabrication tickets and installation drawings.

Fabrication:

- Mechanically Fastened Fabrication Dimension Check: The fabricator retrieves the parts from the staging area and verifies the parts have been cut correctly per the fabrication ticket. He matches the part numbers with the extrusions that have been cut for it and verifies the fasteners for the assembly. He confirms if the unit is to be prefinished or post finished.
 - Double checks fabrication ticket with unit.
 - Inspect all material surfaces and edges for any damages or blemishes.
 - Examine assembly instructions shop drawings prior to assembly.
 - Check that screws are in flush alignment of the material face at a 1/32" maximum projection with a 1/16" maximum indentation.
- Welded Units Fabrication Dimension Check: The fabricator retrieves the parts from the staging area and verifies the parts have been cut correctly per the fabrication ticket. He matches the parts with the extrusions that have been cut for it.
 - Double checks fabrication ticket for the unit.
 - Inspect all material surfaces and edges for any damages or blemishes.
 - Examine assembly instructions and weld specifications on shop drawings prior to assembly.

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- Qualified welders assemble and weld units per approved shop drawings and fabrication tickets.

 - Final Blemish Check: The fabrication is now complete and is ready for crating. The fabricator takes one last look at the unit, and makes sure that it was fabricated per the fab sheet and there are no nicks, dings, or scratches on the unit face. He initials the units and they are picked up by the packager.
 - Double check that material is correct size, type, color, and thickness.
 - Double check job register number, elevation identification as per the fabrication tickets and installation drawings.
 - Inspect all material surfaces and edges for any damages or blemishes.
 - Verify overall unit height and length dimensions.
 - Verify all tolerances.

Product Packaging & Shipping

- Visually inspect crates for damage, prior to securing units into the crates.
- Inspect spacers are installed between units to prevent damage, rubbing, and/or bending during transportation
- Verify units are secured using proper packing materials and methods.
- Confirm all units, parts and pieces are in the crates and are on packing list.
- Confirm that all crates have been properly secured to flat bed.
- Complete final visual inspection of units and crates for any damage.

Conclusion

The overall goal of Intertec's quality control program is to conduct consistent and effective processes such that work performed naturally conforms to the contract requirements. Inspection will be performed and documented for the purpose of evaluating the effectiveness of our work processes, identifying and correcting non-conforming work, and ensuring the quality of the work is not compromised.