

GLOBAL SUPPLIER QUALITY MANUAL

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Appendix

Ingersoll Rand Site Location may provide additional “Site Specific” information in an Appendix, as necessary as well as making clarifying comments within this document.

SECTION 1 - QUALITY POLICY

Ingersoll Rand's Quality Policy:

- Flawless Execution. We cultivate continuous improvement and reward measurable results.
- As a company and as individuals we take responsibility for the quality of everything we do.
- We share best practices and solve problems for our internal and external customers.
- We comply with all customer, statutory and regulatory requirements. And we recognize that our suppliers are an integral part of the value chain that produces and delivers excellence.

SECTION 2 - PURPOSE

This manual establishes the general requirements for suppliers of Ingersoll Rand for the procurement and supply of production components, raw material, ancillary items, and services used in the production of our products. Ingersoll Rand relies on the integrity of the supplier's quality systems, but recognizes good quality is only achieved through good process controls and effective monitoring of process output. As such, ISO 9001 or equivalent quality system certification is considered a good foundation but is recognized as only one aspect when addressing a supplier's capabilities.

SECTION 3 - SCOPE

This Supplier Quality Manual applies to all suppliers who provide goods and services to Ingersoll Rand. Suppliers with programs established with one industry (e.g. QS 9000) may substitute their own forms and formats and may deviate from this supply manual upon written agreement from Ingersoll Rand.

SECTION 4 - QUALITY PHILOSOPHY

Ingersoll Rand is a leading corporation having a reputation for excellence in all it does. A critical component of our leadership is the world-class quality of the products and services that we provide to our customers. As a supplier, you play an integral role in helping us set the benchmark for world-class quality year after year.

The development and manufacture of any product in today's market requires an effective documented quality system which identifies, coordinates, and controls all key activities necessary to produce a quality product. The system should be based on the philosophy of collaboration and continuous improvement, emphasizing defect prevention and the reduction of variation and waste in the supply chain.

In order to meet our customers' rising expectations in terms of cost, quality, and delivery, it is imperative that the materials, machines and processes used in the manufacture of our products have the ability to satisfy the required tolerances and specifications when properly maintained and controlled. Material, machines and processes that can be controlled through the use of statistical methods and mistake proofing methods are crucial to achieving our goals for low cost, highest quality and best on-time delivery. Note that it is never acceptable to knowingly pass a defect to the next stage of the production process. A defect is anything that does not meet specifications.

Therefore, continuous improvement in both products and processes by suppliers to Ingersoll Rand is critical for us to maintain the world-leadership position in our marketplaces. Achieving conformance to requirements by inspection, sorting, scrap, and rework is neither cost effective nor does it result in optimum quality levels. We expect our suppliers to continuously strive for improvements in the products and services that they supply to Ingersoll Rand. This permits us to progressively reduce the controls and checking of the products of our suppliers.

SECTION 5 - SUPPLIER SELECTION /QUALIFICATION

Ability, capacity, integrity, safety compliance, environmental compliance, financial status, geographical locations, performance, reliability, quality of product, quality management system certifications, delivery and overall customer-supplier relations are factors which govern the evaluation of all sources prior to soliciting their quotation and during the tenure of the purchase contract. We must be assured that new suppliers will be able to produce an improved product, reduce costs or offer other competitive advantages. The

Supplier Qualification process will first involve an ISO based supplier self-assessment followed up with an on-site assessment as deemed appropriate. The on-site assessment will be used to confirm the strength of the Quality Management System as well as look more deeply into specific processes which the supplier must control to be able to meet all order requirements.

5.1 Supplier Metrics

5.1.1 PPM: The supplier's delivery quality is measured in PPM (parts per million.) This calculation takes into account the amount of defective parts in relation to the total amount of delivered parts per delivery occurrence.

$$PPM = \frac{(\# \text{ of defective parts})}{(\# \text{ of delivered parts})} \times 1,000,000$$

Some Ingersoll Rand sites may report delivery quality information in a slightly different methodology to account for low volume components (Simple Number of Non-Conformances).

5.1.2 On-Time Delivery: Ingersoll Rand expects 100% adherence to delivery dates by its suppliers. This is delivery date indicated on the purchase order and confirmed by the supplier. It is the actual delivery date used to measure supplier OTD. Unless otherwise noted, suppliers will be evaluated against their first confirmed commitment date.

5.1.3 Responsiveness (Turn Around Time): Supplier Responsiveness, "Turn Around Time" to provide Containment and Corrective Action to problems is vital for all of us to satisfy our customers. Specific site requirements may vary, but it is the expectation that the suppliers always meet or beat targets given for responding and this will be measured and tracked by each site.

Section 6 - Proper Relationships with Suppliers

It is the policy of Ingersoll Rand to award contracts for all goods and services on the basis of merit. Suppliers will be treated with fairness and integrity and without discrimination. To do so, all employees in any organization having contact with suppliers or potential suppliers must maintain the highest standards of ethics and business practices. Ingersoll Rand has Conflict of Interest guidelines for our employees who work with suppliers or potential suppliers.

We understand that giving business gifts is commonplace in some cultures and geographies, and may represent merely a desire to build goodwill. Ingersoll Rand, however, has very restrictive policies governing receipt of business gifts by employees who have direct purchasing responsibilities. Purchasing decisions must not be influenced by a conflict of interest and must not be tainted even by the appearance of a conflict of interest.

SECTION 7 - SUPPLIER QUALITY EXPECTATIONS

The foundation for any positive supplier-customer relationship starts with clear communication and an understanding of the customer's expectations. Accordingly, Ingersoll Rand expects, but is not limited to, the following:

7.1 Purchased products and services that comply with established specifications:

- Engineering specifications that apply to the product or service
- Material specifications that apply to the product or service
- Drawings that apply to a specific product or service
- Industry standards not explicitly called out in specifications
- Products and services must meet 100% of all requirements

7.2 Suppliers are required to review and know all Ingersoll Rand requirements related to the product or service they are providing. **Suppliers are expected to contact Ingersoll Rand when they do not understand a requirement** or are not clear on the use of their product within the product and/or assembly.

7.3 Suppliers are required to comply with, develop and improve systems based on ISO9000 or similar Quality Management System requirements including:

- General Documentation
- Management Responsibility
- Human and Other Resource Management
- Planning of Product Realization and Customer Related Processes
- Design and Development
- Purchasing
- Production and Service Provision
- Measurement
- Control of Non-Conforming Product
- Analysis of Data
- Continuous Improvement

7.4 Suppliers must maintain adequate controls over their suppliers of raw materials and components to ensure the integrity of the product or service provided. It is expected that suppliers will deploy throughout their supply chain controls similar to those presented here.

7.5 Suppliers are required to maintain process and product/service documentation. Change control systems must react to changes in a timely and accurate fashion.

7.6 Suppliers are expected to assist Ingersoll Rand in problem resolution activities related to their products and services. This requirement includes advising Ingersoll Rand on the proper use of their product and service, and investigating problems involving interactions with other components in the Ingersoll Rand system. Suppliers are expected to have the expertise and resources to perform effective root causes analysis using the appropriate problem-solving tools such as the 8D Method and to institute robust corrective actions in order to prevent recurrence of future non-conformances. The corrective action effectiveness must also be tracked and will be audited by Ingersoll Rand.

7.7 Suppliers must obtain written approval by Ingersoll Rand prior to implementing any change to their process that affects the fit, form or function of Ingersoll Rand components. Failure to do so may result in significant penalties.

7.8 Suppliers must notify Ingersoll Rand of any and all situations that may negatively impact the supplied product's quality, reliability and safety; Ingersoll Rand design and/or production; or any other matter described in this manual.

SECTION 8 - COMMUNICATIONS

8.1 Contacts

While the processes in this manual attempt to reduce the number of individuals a supplier must work with, the need for speedy and efficient resolution of issues may require some direct communications. In some cases, a Supplier Contact Sheet may be required. The specific Ingersoll Rand site location will dictate the form and method of contact information.

In general, the following contact points should be used.

8.1.1 Primary Contact:

The Supplier's Contract Manager/Buyer is the primary contact for all matters regarding Ingersoll Rand purchasing.

8.1.2 Product Part Quality:

The source for resolution of Supplier Quality issues is the Value Stream Quality Engineer or Quality Manager or Supplier Quality Manager

8.1.3 Warranty/Field Returns:

Field Returns are handled directly with the contact name provided.

8.2 Product Specific Communications:

Additional and/or different requirements may exist for Goods not bound for the U.S. and those requirements will be communicated via your Site location contact.

8.2.1 Country of Origin Markings:

Site specific guidance to be provided as necessary

8.2.2 Traceability

Suppliers are required to be able to provide material certifications on production components if required for any order current or completed. Traceability is required for all forms of raw material including bar, forgings, castings, and resin. Records retention procedures at the supplier's facility should enable Ingersoll Rand to trace from the heat/pour/melt number/date code to the certifications on the raw material use in the production of Ingersoll Rand parts.

8.2.3 Technical Information

As part of the purchase order process, suppliers will be provided with numerous forms of information. Suppliers are to utilize the following hierarchy of information as they process our purchase orders.

1 - Drawing:

This is the primary document defining the technical requirements in cases where a drawing is provided with the order. For those drawings that do not specify the materials of construction, materials are called out in the purchase order text.

2 - Purchase Order:

The text information provided with our purchase orders is also used to control the configuration of our parts. On parts with accompanying drawings, purchase order text is used to supplement drawing information. For instance, material specifications and any supplemental requirements will be defined in the purchase order text.

For parts that do not require drawings, purchase order text is the governing document and will provide sufficient information for the supplier to respond to our purchase order. For instance, the text might call out the manufacturer's part number, or specific dimensions and material requirements for industry standard parts.

3 – Ingersoll Rand Specifications:

In some cases, Ingersoll Rand Companies will provide a proprietary specification defining specific product details. The Ingersoll Rand Specification document will be referenced on the drawing or in the purchase order text.

4- General Conditions of Purchase (Terms and Conditions of Purchase):

It is imperative that suppliers understand and comply.

5 - Industry specifications:

Industry standard specifications are used whenever possible. Suppliers will find reference to ASTM, DIN, JIS, EU and other similar international standards organizations.

8.2.4 Proprietary Information

Suppliers are reminded that any information provided in the course of doing business with Ingersoll Rand, is considered proprietary. Consequently, suppliers have an obligation to protect such information from inadvertent disclosure. Appropriate cautions must be employed in the event any sub-contract operations are performed outside of the supplier's control. An executed proprietary information agreement must be on file with Ingersoll Rand.

SECTION 9 - GENERAL REQUIREMENTS

9.1 Quality Audits

A properly-functioning quality management system at the supplier site is a prerequisite for meeting the Ingersoll Rand required competitive cost and quality requirements for all products and services. The supplier shall permit Ingersoll Rand to audit its systems, processes and products at an agreed and appointed time.

9.2 Ingersoll Rand Production Part Approval Process PPAP – (First Article Inspection / FAI)

The Ingersoll Rand Production Part Approval Process PPAP will be used to determine if the supplier properly understands all Ingersoll Rand requirements and the supplier's process has the capability to meet these requirements during actual production runs. The components must be produced using the actual process under consideration. The process qualifies production for specific circumstances such as: specific tooling, equipment, line, factory, and sub-tier production processes. The submission must reflect this. Ingersoll Rand Site specific forms will be provided

9.2.1 When to submit:

- Suppliers must submit when new parts, materials or processes are being provided for the first time.

- The supplier is responsible to alert Ingersoll Rand whenever production circumstances (e.g., movement of production or tooling location.)
- Submit Documentation in electronic form to the assigned Quality Engineer, Supplier Quality Engineer or designated site contact.

9.2.2 Typical PPAP/FAI Submission Documentation:

- Initial Sample Submission: The Supplier Part Submission Cover Sheet form will be used to transmit the initial sample submission documents or information.
- Sample Pieces: The specific sample size will vary based on factors such as component size, complexity, cost of manufacture, and projected volume, and will be communicated to the supplier by Ingersoll Rand. Where multiple production molds, cavities, dies or machines are to be utilized, samples may be required from each to be used during follow-on production. Samples must be taken or made from actual production tooling and/or processes unless otherwise approved in writing.
- First Article Data Report: Dimensional results of the submitted samples, referenced to the part drawing requirements, must be provided. Actual measurements must be provided, whenever possible, (not attribute data such as just “Good” or “Bad”).
- Material, performance, and durability test results as specified: For certain critical parts, Ingersoll Rand may require testing by third parties. If required, the supplier, or a qualified independent third party, must supply specific material, performance and/or durability test results. Actual results must be compared with agreed upon specifications. Products that do not meet requirements will be rejected. Suppliers should discuss results with Ingersoll Rand.
- Other Documentation as Specified: Ingersoll Rand may impose other requirements as necessary such as Process Flow Diagrams, Control Plans, and external drawings such as production sketches, Heat Treatment records, Plating and/or Painting. Ingersoll Rand will identify these additional requirements early in the Approval Process for Production Parts via the Purchase Order.

SECTION 10 - SPECIFIC REQUIREMENTS

10.1 Non-Conformance/Corrective Action Requests (NCM/NMR/CAR/SCAR)

In the event that supplier defects are discovered at Ingersoll Rand, the parts/components in question will be identified and segregated to preclude further use. Ingersoll Rand will make a determination of the next steps to be made in the process based on several criteria, including the defect’s criticality, quantity, cost, and other factors. Based on this evaluation, Ingersoll Rand will determine whether the:

- Defective parts are:
 - Returned to the Vendor / Supplier (“RTV”).
 - Scrapped
 - Sorted at Ingersoll Rand at Supplier’s expense.
 - Reworked at Ingersoll Rand at Supplier’s expense.

Ingersoll Rand will request a supplier to submit a formal written corrective action to address specific non-conformances identified at either a plant or in the field. The need for a formal corrective action request will be evaluated in terms of potential impact upon production costs, quality costs, performance, reliability, safety, and customer satisfaction. Suppliers are expected to fully comply with these requests. Typical response times for corrective action may vary based on the nature of the product issue and severity of the problem (**Site specific guidance to be provided as necessary**).

Supplier Corrective Action Requests (SCARs) will be issued to the supplier. The supplier’s response must include root cause analysis, containment action (short-term corrective action), and permanent (long-term) corrective action and mistake proofing (preventive action) using the 8D or similar method.

Suppliers must track the effectiveness of their mistake proofing. Repeat escapes after implementation of mistake proofing shall trigger

further SCARs.

10.2 Product/Process Deviation Request

In certain instances, it may be necessary for the supplier to deviate from Ingersoll Rand requirements and specifications. Request for such deviations shall be made prior to shipping the parts/material, using the Ingersoll Rand deviation request or notification form. Your Ingersoll Rand Site locations will provide you with the form if such a deviation is required.

A deviation request may arise from the following situations:

- A supplier may initiate the deviation request because of non-conforming material found at their facility.
- A supplier may initiate the deviation to request a substitution of material, processing method, or change in procedures.
- Ingersoll Rand may initiate the request to document a change to specifications prior to a formal product change authorization being completed.

The deviation request form must provide all required and pertinent information about the requested deviation. The supplier is responsible for the segregation and non-shipment of the non-conforming material until a deviation is granted. Discrepant material received at Ingersoll Rand without an approved deviation request will be rejected and returned to the supplier at the supplier's expense with all additional handling and shipping costs incurred by the supplier.

No discrepant material will be processed until all required personnel approve a deviation. All supplier initiated requests for deviations must be accompanied by a written corrective action plan (if applicable). Once approved by Ingersoll Rand, all material shipped to Ingersoll Rand must be accompanied by a copy of the approved deviation request. Ingersoll Rand views the excessive use of deviation requests for non-conforming material as an indicator that a supplier may have a serious breakdown in their quality system. Suppliers are discouraged from using the deviation request as a mechanism to ship non-conforming material. The deviation request shall not be used to cover up or replace proper quality systems and process controls at the supplier location.

10.3 Reliability and Maintainability Test Results

Suppliers may be required to provide reliability and/or maintainability test results to Ingersoll Rand as requested. In these cases, the test plans will be submitted to Ingersoll Rand for approval. Suppliers shall submit all results, with test parts if requested, at the completion of the test.

10.4 Subcontracting Requirements

Subcontracting is generally permitted for machining and inspection operations. However, the use of subcontracting for special processes such as heat treat, plating, and other critical processes will require our prime supplier to disclose that contractor's responsibilities and capabilities to the appropriate Ingersoll Rand buying organization. Ingersoll Rand reserves the right to review, approve and audit any subcontractors providing processes and services critical to the function of our equipment. When a supplier subcontracts, it is the supplier's responsibility to obtain any certifications required by Ingersoll Rand.

10.5 Measurement and Inspection Analysis

Ingersoll Rand expects suppliers to maintain a robust gage calibration system. Supplier inspection data may be required for dock to stock items or items going to Ingersoll Rand's Receiving Inspection.

SECTION 11 – CHANGE/ CONFIGURATION CONTROL

Ingersoll Rand will provide the supplier with changes to drawings or specifications. The supplier will ensure that changes are implemented throughout the production process and that supporting documents such as Work Instructions, Control Plans and Inspection Plans are updated.

For changes initiated by the Supplier, the supplier will ensure that the correct revision level of the part is provided to Ingersoll Rand. (Note: The supplier must contact Ingersoll Rand and obtain written approval prior to implementing the change.)

It is the supplier's responsibility to communicate with Ingersoll Rand on any discrepancies or misunderstandings. For errors or mistakes found on Ingersoll Rand documents, the supplier shall use the Deviation Request Form.

SECTION 12 - PROCESS CONTROL

Suppliers shall control their production processes to ensure that they are stable and in control. Controls should include:

- First piece inspections to qualify machines/processes for production use
- In process inspections to monitor production runs
- Final inspection to verify requirements are met
- Measuring equipment is calibrated and there is a documented calibration system
- Preventive maintenance program for machinery
- Precautions are made to prevent part damage while going through the supplier's process and during shipping
- Generally Accepted Manufacturing Workmanship Standards such as:
 - MSS SP-55-2006 – Quality Standard for Steel Castings for Valves, Flanges, Fittings, and Other Piping Components, Visual Method for Evaluation of Surface Irregularities.
 - ASTM A802/A802M – Standard Practice for Steel Castings, Surface Acceptance Standards, Visual Examination.
 - ASTM A48/A48M-03 – Standard Specifications for Gray Iron Castings
 - ANSI B46.1 Surface Roughness and Waviness

SECTION 13 - WARRANTY REQUIREMENTS

Definitions of warranty obligations of suppliers are provided in the commercial contract in force between the supplier and Ingersoll Rand. In certain circumstances, the supplier may be expected to reimburse Ingersoll Rand for warranty claims due to product non-conformance.

SECTION 14 - CONTINUOUS IMPROVEMENT

Ingersoll Rand wants to work with suppliers who continuously improve performance in terms of cost, quality, and delivery. Specific measures of performance will be communicated to suppliers by the particular Ingersoll Rand plant for which products and services will be provided.

It is the supplier's responsibility to track their own performance, and to improve the value provided by their product or service to Ingersoll Rand. Improvements that result in changes to processes or product must be addressed through Deviation Requests as required by this manual and/or the supplier's specific contract.

SECTION 15 - CERTIFICATIONS

Certain customers of Ingersoll Rand and our affiliated companies require material certifications (from mills and/or resin suppliers, etc.) for our products. Some orders may also require additional certifications related to ATEX, Welding, NDE, Inspection, etc... If certifications are required from our supply base to support this requirement, the requirements will be specified on the drawings or specified in the purchase order text.

Any documentation that is provided under this section is to be clear and legible so as to enable good quality reproductions when received by the Ingersoll Rand entity. Submit documentation in electronic form to the appropriate entity location. All certifications are to be in provided in the English language unless otherwise specified in the Purchase Order.

SECTION 16 - SPECIAL TESTING

Supplier's performance for Ingersoll Rand may include requirements for other than just manufactured components. Occasionally our customers require documentation such as performance test reports or in some cases, even destructive tests. These and other special requirements will be specified in the purchase order text.

SECTION 17 - NON-DESTRUCTIVE TEST

The use of non-destructive testing such as magnetic particle inspection, dye penetrant inspection, radiographic inspection, and other non-destructive inspection techniques will be as specified on the purchase order information or drawing or both. Certificates of

conformance and/or other objective evidence of the tests are to be provided in the documentation provided with supplier's shipment. The purchase order will reference the specific test method standard that applies to the particular item tested.

SECTION 18 - CASTINGS

Castings shall not be weld repaired, unless specifically allowed by the material specification, and without prior written approval from Ingersoll Rand.

SECTION 19 - PACKAGING AND PROTECTION

Components are to be packaged appropriately (to prevent part damage during shipping, handling and storage) for the transportation mode, and utilizing materials friendly to the environment and easy to dispose of or recycle at the receiving facility.

Parts that can be easily damaged, such as machined parts with exposed threads, are to be separated from each other to preclude handling or transportation damage.

Items shipped in enclosed wood crates should be constructed with heat treated government approved wood using screws for ease of disassembly and reuse. (Site specific guidance to be provided as necessary).

Ingersoll Rand and the supplier will mutually agree upon suitable packaging materials used in the process of supplying parts. We encourage the use of the supplier's standard techniques to minimize costs.

The use of returnable packaging is encouraged where practical.

19.1 Part Marking

Parts may be required to be identified with an appropriate part marking method to show supplier identification, part number, revision level, and the lot number or heat number of the raw material used in the manufacture of the parts. These markings are to be visible after machining. If it is impractical to physically mark the parts, bagging and/or tagging methods may be employed provided the marking method includes the above information.

19.2 Part Segregation

Do not combine different parts in the same box or bag. Properly identified and clearly marked Individual boxes or bags may be consolidated into a larger box for shipping purposes.

19.3 Corrosion Protection

The supplier is expected to work with Ingersoll Rand to provide acceptable corrosion protection techniques that take into account the shelf life of the part and the transportation mode.

SECTION 20 - ENVIRONMENTAL HEALTH AND SAFETY

20.1 Suppliers Visiting Ingersoll Rand Sites

Effective management of environmental resources is extremely important to Ingersoll Rand. Continuous improvement in environmental issues is an important part of Ingersoll Rand's mission. All material purchased from Ingersoll Rand suppliers and used in the manufacturing of Ingersoll Rand products must meet the relevant and valid legal and Ingersoll Rand requirements regarding environmental protection and occupational safety.

Contractors or suppliers visiting any Ingersoll Rand location: Ingersoll Rand requires that all applicable Environmental, Health and Safety measures be followed by contractors or vendors during all phases of work on all projects to ensure the safety of contractor personnel, Ingersoll Rand employees and property.

20.2 Five Minimum Expectations for Supplier EH&S

- Provide safe working conditions for all employees, customer and contractors.

- Adhere to all applicable national, regional, state and local laws and regulations governing Environment, Health & Safety.
- Operate in a manner that minimizes the impact to the environment.
- Limit the use of natural resources and promote sustainable natural resource practices.
- Extend and communicate these EH&S requirements to their employees and suppliers.

20.3 Contractors may be asked to provide the following information on their EH&S Program:

- TRIR, LDIR, and DART rates for the last 3 years.
- OSHA Logs for the last three years
- WC EMR for the last year years
- Information on any regulatory inspections and fines
- Certificate of Insurance
- Safety Manual
- Records of employee training required to perform the project work e.g. Lockout/Tagout, Confined Space, Electrical Safety, Fall Protection
- Pre-job hazard assessment

