

PENTAIR GLOBAL SUPPLIER GUIDE

(Revision A)

Delivering sustainable growth through a predictable supply chain that is committed to quality and continuous improvement



UNCONTROLLED IF PRINTED

We believe that honesty and integrity should define our relationships with customers, business partners, investors, and each other.



TABLE OF CONTENTS

1.0 Introduction	6.0 Quality System Expectations
1.1 Purpose and Scope	6.1 Material Traceability & Quality Records
1.2 Code of Conduct	6.2 Handling, Storage & Distribution
1.3 About Pentair	6.3 Tooling Management
1.4 Lean Enterprise	6.4 Nonconforming Material
1.5 Pentair Integrated Management System	6.5 Corrective Action
1.6 Supplier Lean	6.6 Controlled Shipping
	6.7 Cost Recovery
2.0 Key Roles and Responsibilities	7.0 Product Realization
2.1 Pentair	7.1 Supplier Expectations
2.2 Supplier	7.2 PPAP
	7.3 Safe Launch for Critical Components
3.0 Compliance	7.4 Part Recertification
3.1 Environmental, Health & Safety	7.5 Recommended PPAP Resources
3.2 Origin	7.6 Change Management
3.3 Harmonized Tariff Schedule Codes	7.7 Supplier Deviation Request
3.4 Conflict Minerals	
3.5 Import/Export	Appendix A: Acronyms
3.6 ITAR & Dual Use Export Controls	Appendix B: Terms, Definitions & References
3.7 Prohibited Countries & Entities	Appendix C: North America Supplier Routing Guide
3.8 Anti-Corruption Laws	Appendix D: Revision History & Contact Information
3.9 Data Privacy	
3.10 General Compliance	
3.11 Supply Chain Security	
3.12 Intellectual Property	
3.13 Product Warranty	
3.14 Liability, Indemnity and Hold Harmless	
3.15 Counterfeit Parts	
4.0 Materials & Logistics	
4.1 Delivery	
4.2 Shipping Terms	
4.3 Marine (Cargo Insurance)	
4.4 Labeling and Packaging	
4.5 Invoicing	
4.6 Request for Quotation	
4.7 Purchase Order Types	
4.8 Payment Terms	
4.9 Subcontractor Purchasing	
5.0 Supplier Qualification & Performance	
5.1 Quality Management System (QMS) Requirements	
5.2 Risk Assessments	
5.3 Supplier Selection	
5.4 Performance Expectations	
5.5 Supplier Development	
5.6 Supplier Scorecards	

1.0 INTRODUCTION

1.1 PURPOSE AND SCOPE

The purpose of this Global Supplier Guide (GSG) is to clearly communicate Pentair's quality expectations to all new and existing external Suppliers. These quality expectations apply to the development, manufacture, and delivery of all products and services supplied to Pentair. Suppliers have a direct impact to Pentair delivering high-quality product to our customers. Therefore it is important to understand expectations, identify gaps and track progress to gap resolution. Pentair establishes long-term partnerships with Suppliers who strive to meet performance expectations and comply with regulatory requirements.

Quality requirements and expectations may take the form of a contract/agreement or specification. The expectations and guidance within this manual are provided as a supplement, not as a replacement for or altering of the terms or conditions with pre-established contracts/agreements, engineering drawings or specifications.

If conflicting interpretations of the standards arise, the following order of precedence applies unless otherwise noted contractually:

1. Supply Agreements
2. Specification Requirements (PPAP, etc.)
3. Pentair Purchase Order
4. Global Supplier Guide

Please note that Supplier's business relationship is with the particular Pentair operating company which is buying the goods/services ONLY and *not* with Pentair plc or any other Pentair entity.

1.2 CODE OF CONDUCT

Pentair's relationships with Suppliers are based on lawful, efficient, and fair practices. Pentair expects our Suppliers to:

- Abide by applicable laws, rules and regulations of the countries in which they operate including the United States
- Uphold the human rights of workers and treat them with dignity and respect
- Ensure a safe and healthy working environment
- Practice social and environmental responsibility
- Demonstrate the highest standards of business ethics

Pentair reserves the right to discontinue business relationships with Suppliers that fail to conduct business in a legal, responsible, and ethical manner.

1.3 ABOUT PENTAIR

At Pentair, we believe the health of our world depends on reliable access to clean water. We are a global water treatment expert whose technologies and know-how deliver purity, consistency and efficiency to residential and commercial customers ... and to thirsty humans around the world. Our smart, sustainable solutions provide water people can depend on to make the most of life.

Our work is driven by our belief that the health of our world depends on reliable access to clean water. A deep-rooted culture energizes our employees to make a difference within and beyond the workplace. We do so by delivering innovative technologies and solutions to our customers, pursuing continuous improvement across our operations, supporting their teams and communities, and contributing to our philanthropic work and corporate responsibility initiatives. Our Win Right values and guiding behaviors are the foundation for our company and shape how we do business and treat one another.

1.4 LEAN ENTERPRISE

Pentair's operational excellence philosophy and methodology is based on lean enterprise thinking and processes. We view ourselves as extensions of our customers' value stream, and our Suppliers as extensions of our value stream. Throughout the extended value stream (Supplier to customer) Pentair strives to remove waste, improve quality, and improve delivery with increased velocity. Pentair is committed to helping Suppliers in their continuous improvement efforts including, but not limited to, training and leading activities at the Supplier.

1.5 PENTAIR INTEGRATED MANAGEMENT SYSTEM

The Pentair Integrated Management System (PIMS) is the foundation of our success at Pentair. PIMS provides the language and tools to ensure we are building sustainable performance across our entire global enterprise. We have spent years building our performance methodologies in Talent Management, Commercial Excellence and Lean Enterprise, and we remain committed to improving our processes every day. It is this commitment to continuous improvement that is the hallmark of PIMS, our culture, and all that we do.

1.6 SUPPLIER LEAN

PIMS is an essential part of Pentair's culture and critical to our future success. Pentair expects its Suppliers to implement continuous improvement programs to align themselves with the Pentair lean culture. Suppliers must continually strive to proactively improve product quality, to remove waste wherever possible and to constantly improve lead times both internally and at their sub-suppliers to reduce inventory. Pentair's Suppliers are encouraged to develop and review procedures and audit plans, and to use a visual management philosophy in order to accomplish this. It is essential that continuous improvement programs reach all levels of the company to ensure all employees gain a sense of ownership in the program.

Examples of continuous improvement activities include:

- **Value Stream Mapping** – Identifying wastes within processes
- **5S** – Organization and visual management for a safe, productive work environment
- **Standard Work/Creating Continuous Flow (CCF)** – Finding the best way to execute continuous flow principles
- **Making Material Flow (MMF)** – Optimizing material flow through stocking strategies, scheduling, and level-loading
- **Root Cause Counter Measure (RCCM)** – Problem solving methodology to identify and eliminate/mitigate issues



2.0 KEY ROLES AND RESPONSIBILITIES

2.1 PENTAIR

Pentair understands our business units may be different in nature than other businesses and in some cases have unique roles and responsibilities to support the functional areas of business, quality, and engineering; however, the main points of contact with our Suppliers will be:

2.1.1 Global Commodity Management - Strategic Supply

The Global Commodity Manager (GCM) is responsible for ensuring streamlined communications between the Supplier and key functions (engineering, supplier quality, purchasing, etc.) within Pentair. The GCM is responsible for the business relationship with the Supplier, including, but not limited to, contracts, quality, cost, and delivery.

2.1.2 Site Level Purchasing/Buyer – Tactical Supply

The Pentair Buyer/Purchasing team at each site handles the day to day interactions with the Supplier including, but not limited to:

- Order fulfillment
- Forecasting – planning and communicating
- Lead time and inventory level maintenance/ optimization/reduction
- Kanban program modifications and implementation
- Supplier portal issues

2.2 SUPPLIER

Pentair expects our Suppliers to identify a designated contact within their organization for the following functions:

2.2.1 Pentair Customer Representative

The customer representative is the primary contact within the Suppliers' organization for any key communications with Pentair, including any quality, delivery or commercial issue resolution.

2.2.2 Pentair Quality Management Representative

The Quality Management representative is responsible for the implementation and maintenance of the Supplier's Quality Management System as defined by ISO 9001, TS16949, AS9100 or similar. This representative also oversees the part qualification process.



3.0 COMPLIANCE

3.1 ENVIRONMENTAL, HEALTH & SAFETY

Suppliers are expected to provide their employees with a safe working environment that supports accident prevention and minimizes exposure to health risks. Suppliers must also comply with the latest revisions of all applicable environmental, health and safety laws and regulations (ex: anti-lead, REACH, RoHS, ISPM 15, Transportation HazMat Regulations, etc.). When requested, Suppliers shall submit to Pentair written product specifications, operating procedures and other information that pertain to environmental compliance.

Pentair is committed to designing, manufacturing, and distributing our products and providing services to our customers in a safe and responsible manner. Pentair cares about the health and safety of our workers, our customers, the communities in which we operate, and the environment. Pentair promotes a work environment philosophy of – “work right”, where safeguarding our people and the environment is integral to our operations. Our Suppliers are expected to adhere to the same philosophy.

Suppliers shall provide Pentair with one (1) electronic and two (2) hard copies of appropriate MATERIAL SAFETY DATA SHEETS (MSDS) with Supplier’s initial shipment to Pentair. In the event of any MSDS updates the first shipment following the update, must include an electronic and hard copy of the revised MSDS sheet. If Supplier’s product does not require an MSDS, Supplier shall provide Pentair with a written statement to that effect.

For all Products and other materials sold or otherwise transferred to Pentair under this Agreement or any other supply agreements with Pentair (together referred to as “Supply Agreements”), Supplier shall provide all relevant information including without limitation, safety data sheets in the language and the legally required format of the location to which the Products will be shipped and mandated labeling information, required pursuant to the latest revisions of applicable requirements such as: (i) Occupational Safety and Health Act (OSHA), regulations codified at 29 CFR 1910.1200, (ii) REACH or EU Directive 67/548/EEC, if applicable, (iii) the Federal Food, Drug, and Cosmetic Act and the Fair Packaging and Labeling Act and (iv) any other applicable law, rule or regulation, or any similar requirements in any other jurisdictions to which Buyer informs Supplier the goods are likely to be shipped, whether or not the standard applies to the activities of Supplier.

Supplier represents, warrants, certifies and covenants that each chemical substance constituting or contained in the Products sold or otherwise transferred to Pentair (including packing materials) hereunder is on the list of chemical substances compiled and published by (i) the Administrator of

the Environmental Protection Agency pursuant to the Toxic Substances Control Act (15 USC Section 2601 et seq.) as amended; and if otherwise the use of which is restricted in any other jurisdictions to which Pentair informs Supplier or the Supplier knows the Products are likely to be shipped to or through; unless Pentair expressly agrees otherwise in writing as an addendum to any Supply Agreement and Supplier identifies an exemption from (ii) the European Inventory of Existing Commercial Chemical Substances (EINECS) or the European List of Notified Chemical Substances (ELINCS); or (iii) any equivalent lists in any other jurisdictions to which Pentair informs Supplier or Supplier knows the Products will likely be shipped to or through; or that Supplier is exempt from the foregoing lists, in which case Supplier shall provide adequate documentation of the validity of the claimed exemption. Supplier further represents, warrants, certifies and covenants that each chemical substance constituting or contained in Products sold or otherwise transferred to Pentair hereunder is manufactured, imported, used and supplied in full compliance with the most recent provisions of REACH or EU Directive 67/548/EEC, and is preregistered or registered, if required, under REACH, is not restricted under Annex XVII of REACH and if subject to Authorization under REACH Annex XIV, is authorized for Pentair's use. In each case, Supplier will timely provide Pentair with supporting documentation, including without limitation, (iv) preregistration numbers for each such substance, (v) the exact weight by weight percentage of any REACH candidate list substance constituting or contained in the Products, (vi) all relevant information that Buyer needs to meet its obligations under REACH to communicate site use to its customers and (vii) the documentation of the authorization for Pentair's use of an Annex XIV substance.

Supplier shall notify Pentair if it decides not to register substances that are be subject to registration under REACH and constitute or are contained in Products supplied to Pentair at least six (6) months before their registration deadline. Supplier will monitor the publication by the European Chemicals Agency of the list of substances meeting the criteria for authorization under REACH (the "candidate list") and immediately notify Pentair if any of the Products supplied to Buyer is manufactured by Supplier with or contains a substance officially proposed for listing on the candidate list. Supplier shall provide Pentair with the name of the substance as well as with sufficient information to allow Pentair to safely use the Product or fulfill Pentair’s own obligations under REACH.

Supplier shall disclose to Pentair the existence of any and all hazardous materials contained in Products and other materials sold or otherwise transferred to Buyer hereunder. Supplier represents, warrants, certifies and covenants that none of the Products supplied under any Supply Agreements with Pentair contains any: (i) lead, mercury, cadmium, hexavalent chromium,

polybrominated biphenyls (PBBs), polybrominated diphenyl ethers (PBDEs) (flame retardants), or any other hazardous substances the use of which is restricted under the latest RoHS directive; (ii) arsenic, asbestos, benzene, polychlorinated biphenyls (PCBs), or carbon tetrachloride; and (iii) any chemical restricted under the Montreal Protocol on ozone-depleting substances; or (iv) any other chemical or hazardous material the use of which is restricted in any other jurisdictions to which Pentair informs Supplier or the Supplier knows the Products are likely to be shipped to or through; unless Pentair expressly agrees otherwise in writing as an addendum to any Supply Agreement and Supplier identifies an applicable exemption from any relevant legal restriction on the inclusion of such chemicals or hazardous materials in the Products sold or transferred to Pentair.

3.2 ORIGIN

Unless otherwise indicated Pentair requires Suppliers to identify the country of origin of each article (product/component), usually on both the product itself, on every level of packaging, and must appear on the commercial invoice or on a separate preferential or non-preferential certificate of origin. If not indicated on engineering drawing, Supplier must discuss with the Pentair team where the origin is to be shown. Do not amend patterns, stamps etc. without the express written permission of Pentair. Suppliers must provide a clear statement of whether or not its products qualify for any relevant free trade agreements, trade preferences) and or other facilitation programs.

Pentair may send annual solicitation communications requesting confirmation of country of origin and other trade related information. All Pentair Suppliers are required to respond in a timely manner to such requests in the format requested. **Use of such terms as EU, GCC or Mercosur shall be limited to relevant declarations.**

The following rules usually apply to both domestic and international transactions:

1. Products/components must be marked with country of origin (unless we agree that it qualifies for a clearly applicable exception).
2. All levels of packaging must be marked with country of origin, including the outside shipping container.
3. All sales invoices and/or packing lists must provide country of origin information.

3.3 HARMONIZED TARIFF SCHEDULE CODES

Each Product supplied must have documentation showing Harmonized Tariff Schedule with each shipment. It must

appear either on the invoice or the packing slip, and be labelled with no less than six digits.

3.4 CONFLICT MINERALS

Pentair expects Suppliers to comply with the U.S. Securities and Exchange Commission (SEC) rules for reporting and disclosure requirements related to Conflict Minerals as part of the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 ("Dodd-Frank Act"). Pentair supports the goals and objectives of Section 1502 of the Dodd-Frank Act that requires public companies to determine the sourcing of tin, tungsten, tantalum, and gold used in their Products and to file an annual report disclosing any such use. As part of our commitment to responsible sourcing and human welfare, Pentair and our Suppliers are expected to adopt a Conflict Minerals Policy.

3.5 IMPORT / EXPORT

Documents must provide the information required for importation in the destination country. Documents must not contain statements, declarations or other affirmations contrary to US Anti-boycott regulations.

For all destination countries that require pre-shipment inspection, consular legalization, Supplier shall ensure that these requirements are performed accurately and timely enough to be fully compliant at least three (3) days before their respective deadlines, or vendor shall accept the resulting penalties.

Suppliers must (where required by the agreed INCO term) file import / export paperwork in a timely and accurate manner that declares full and appropriate values to ensure accurate duty/tax assessment. Suppliers shall ensure values declared are accurate in accordance with applicable customs valuation regulations.

3.6 ITAR & DUAL USE EXPORT CONTROLS

Prior to order acceptance, Suppliers must inform Pentair if the Product or future required spares or relevant software is subject to export and or re-export controls. This is required for all transactions including domestic.

Certain Pentair facilities located in the United States are approved International Traffic in Arms Regulations (ITAR) facilities. Any Supplier providing product or services to an ITAR approved Pentair facility must adhere to applicable ITAR rules, regulations and requirements. The US Department of State's website provides a link to ITAR requirements.

All Suppliers must comply with all exporting and importing country requirements; this includes but is not limited to, ISF, EU Compliance and any other countries of import and export. Please contact PentairCompliance@Pentair.com if assistance is needed in obtaining specific country guidance.

3.7 PROHIBITED COUNTRIES & ENTITIES

Supplier will not purchase, supply or transfer any Products or technical information or services to Pentair except in full compliance with all applicable governmental requirements, including but not limited to applicable economic sanctions and constraints administered by the U.S. Treasury Department and applicable export control measures, administered by the U.S. Department of Commerce and U.S. Department of State, any other U.S. government agencies and measures administered by the European Union or the government agencies of any other countries. Without limiting the foregoing, Supplier will not purchase, supply, or transfer any products or technical information or services to Pentair from Iran, North Korea, Syria, Cuba and North Sudan, including any entities or persons in those countries, either directly or indirectly.

Pentair's policies may be modified from time to time, including in response to subsequent changes in the law. Pentair requires all Suppliers, including domestic; to ensure that they do not sell Pentair anything sold by a company established in or that is of the Origin of the named countries. Pentair requires the Original equipment supplier name and location to enable us to confirm they are not on a restricted or denied list that would prohibit Pentair purchasing the product.

3.8 ANTI-CORRUPTION LAWS

No Payments for Improper Activities. Pentair will not be required under any circumstances to take any action or make Payments that Pentair believes, in good faith, would cause it or its affiliated companies to be in violation of any Anti-Corruption Laws (Anti-Corruption Laws include, collectively, the United States Foreign Corrupt Practices Act, the UK Bribery Act 2010, laws under the OECD Anti-Bribery Convention and local anti-corruption laws).

No Improper Means of Obtaining Business; No Bribes; No Kickbacks; Anti-Boycott. Supplier and Pentair agree that no payments or transfers of value shall be made which have the purpose or effect of public or commercial bribery, acceptance of or acquiescence in extortion or kickbacks or other unlawful or improper means of obtaining business. Supplier and Pentair will not, directly or indirectly, pay, offer, authorize or promise any monies or anything of value (such as gifts, contributions, travel, or entertainment) to any person or organization, including any employee of Supplier's or Pentair's customers, or any Government Official (which includes any employee or official of any governmental authority, government owned or controlled entity, public international organization or political party or any candidate for political office) for the purpose of influencing their acts or decisions. Supplier will take appropriate actions to ensure that any person representing or acting under its instruction or control ("Representatives") will also comply with this Certificate. Supplier will not request that

Pentair take any action which is prohibited or penalized under any anti-boycott law or regulation and any such request will be deemed null and void.

No Conflicts. No Influence On Government Officials. Except as disclosed in writing to Pentair, Supplier represents that it does not believe or have any reason to believe that there are any actual or potential conflicts of interest regarding its relationship with Pentair, including family members who could benefit from the commercial relationship between Supplier and Pentair. In addition, Supplier further represents that neither Supplier nor any of its representatives are or have any family members who are Government Officials in a position to influence Supplier's commercial relationship with Pentair.

3.9 DATA PRIVACY

Data Privacy. Pentair is committed to respecting the privacy of all persons and complies with applicable data privacy laws. Pentair may collect, process and transfer personal data related to the Supplier business relationship to and between Pentair, its affiliates and business partners wherever they may be located throughout the world, for the purposes of evaluating the Supplier's experience and qualifications and implementing any business. The Supplier has the right to: (a) request access to this data; (b) rectify or cancel any inaccurate or expired data; and (c) object to any processing that does not conform to these purposes. Supplier may exercise its rights by writing to Pentair at privacy@pentair.com or to such other location as Pentair may designate. In the case of data services, including software and/or data processing additional requirements will apply.

3.10 GENERAL COMPLIANCE

Supplier must certify compliance with all applicable federal, state, and local laws, statutes, ordinances, governmental administrative orders, rules, and regulations relating to the manufacture, sale and use of the equipment, and those relating to ethical and responsible standards of behavior, including, without limitation, those human rights (anti-slavery, human trafficking, conflict mineral sourcing), environmental protection, sustainable development, bribery and corruption (the "Rules").

Accurate Books and Records. Supplier will maintain complete and accurate books and records in accordance with generally accepted accounting principles in Supplier's jurisdiction, consistently applied, properly and accurately recording any and commission, compensation, reimbursement or other payment ("Payments") made by Supplier in performance of, on behalf of or related to work for Pentair. Supplier will maintain a system of internal accounting controls reasonably designed to ensure that its assets are used only in accordance with its management directives and that it maintains no off-the-book accounts.

Notification. Supplier will notify Pentair promptly if (a) Supplier or any of Representatives have reason to believe that a breach of these policies has occurred or is likely to occur; or (b) if any conflicts of interest arise; or (c) if Supplier or any of Representatives or their family members become a government official or political party candidate in a position to influence Supplier's commercial relationship with Pentair. Supplier will send all such notices to ethics@pentair.com.

Breach and Termination. Termination Rights. Any breach of the warranties, representations or agreements of these policies will constitute a material breach of this and be grounds for immediate termination for cause of this relationship, any Supply Agreements and/or any order and Pentair may withhold any Payments until such time that Pentair has received confirmation to its reasonable satisfaction that no breach has occurred or will occur. Supplier will indemnify and hold Pentair harmless against any actions, legal claims, demands, proceedings, losses, damages, costs, expenses and other liabilities of whatever nature resulting from Supplier's breach of the representations, warranties and agreements contained in these policies. Pentair reserves the right to refuse to enter into or perform any order, and to cancel any order, if Pentair, in its sole discretion, determines that such order could violate any applicable law or regulation of the United States, or any other country. The parties agree that any such refusal or cancellation of any order, or termination of the Certificate relationship by Pentair, as described above, will not constitute a breach of any of Pentair's obligations under this Certificate, and Supplier hereby waives any and all claims against Pentair for any loss, cost or expense related thereto.

Many US Pentair legal entities are United States federal contractors obligated to take affirmative action to employ women, minorities, disabled individuals, and veterans. Those Pentair legal entities are also required to inform those with whom it conducts business that they, too, may have such obligations. By operation of law, as well as by this notification, the Equal Employment Opportunity Clause required under Executive Order 11246, (41 C.F.R. 60-1.4), the affirmative action commitment for special disabled veterans and veterans of the Vietnam Era set forth in 41 [C.F.R. 60-300.44(f)(1)(ii)], the Affirmative Action Clause for Section 503 of The Rehabilitation Act of 1973 set forth in 41 [C.F.R. 60-741.44(f)(1)(ii)], and the related regulations of Secretary of Labor, (41 C.F.R.), Chapter 60, are incorporated in all of Pentair's contractual relationships with its Suppliers.

3.11 SUPPLY CHAIN SECURITY

In addition to undertaking the various classification and origination measures required by Pentair, each Supplier shall participate in any supply chain security programs enforced in the countries where they operate. Notable examples include the Customs-Trade Partnership Against Terrorism ("CT-PAT") administered by U.S. Customs & Border Protection ("CBP"), the Canadian Border Services Agency's Partners in Protection Program, and the various Authorized Economic Operator Programs ("AEOs") administered in the EU, Japan, South Korea, and Taiwan.

All Suppliers must develop, implement, and maintain procedures that meet or exceed the minimum standards for the supply chain security programs applicable in the jurisdictions where they operate. Suppliers must also require their carriers, customs brokers, freight forwarders, and other relevant partners to comply with those same standards when processing shipments on Pentair's behalf.

3.12 INTELLECTUAL PROPERTY

All information, drawings, materials, goods and equipment provided to Suppliers by Pentair or arising from work or services performed on behalf of Pentair shall be treated as confidential and proprietary to Pentair and shall not be disclosed or shown to third parties without prior written permission of Pentair. Suppliers must sign Pentair's Non-Disclosure Agreement and must otherwise diligently protect such information in no less than the same manner that they would protect their own confidential information.

3.13 PRODUCT WARRANTY

If either party becomes aware of a potential manufacturing or design 'Defect' in a product (material, parts, assemblies, and/or services supplied by Supplier to Pentair), that party will promptly deliver written notice of the potential Defect to the other party's designated recipients. Supplier must then provide analysis related to the potential Defect as requested by Pentair. Supplier will fully cooperate with Pentair to promptly implement appropriate corrective and preventative actions including the delivery of corrected replacement product(s) at no cost to Pentair or its customers.

Pentair's end-user warranty terms vary depending on the product and channel through which the product is sold. In any event, Supplier's warranty period must match or exceed Pentair's applicable end-user warranty period. Pentair and Supplier may agree in writing to different warranty terms for specific products, categories of products, and/or geographic locations.

At a minimum, Suppliers must provide Pentair with the following warranties:

- All products must be fit for sale, of good material and workmanship, and free from defect
- Products must be transferred to Pentair free and clear of all claims or encumbrances

All Products will be manufactured, processed, packaged, labeled, marked, tested, certified, weighed, inspected, loaded, shipped and sold by Supplier in compliance with all applicable drawings and specifications, laws, rules, regulations and standards.

In the event that Pentair is obligated to repair or replace a product due to a defect in a Supplier-provided product, the following will occur:

- Supplier will promptly correct the Defect through repair, replacement or refund (at Pentair’s discretion) at no charge to Pentair
- Supplier will promptly reimburse Pentair for any of the following related costs (ex: diagnosis, removal, shipping, installation, rework, testing, etc.)
- If requested by Supplier, Pentair will return a representative sample of defective product to Supplier at Supplier’s Expense.

3.14 LIABILITY, INDEMNITY and HOLD HARMLESS

Pentair’s Suppliers must agree to defend, indemnify and hold harmless Pentair, its affiliates and their respective directors, officers, employees, agents, and customers from and against any and all claims, actions, demands, damages, losses, judgments, settlements, costs and expenses, including without limitation attorneys’ fees, arising out of or in connection with any of the following:

- Mandatory or discretionary recall of Supplier product by Pentair, a customer thereof or any regulatory entity for safety or other reasons;
- Alleged and/or actual infringement of any intellectual property right of any third party in connection with the products or any unfair competition involving the products;

- Death of or injury to any person, damage to any property, or any other damage or loss, by whomsoever suffered, allegedly resulting from or relating to the products or services supplied by Supplier;
- Alleged and/or actual violation by Supplier or its products of any laws, rules, ordinances or regulations;
- Breach of any agreement, late delivery or product non-conformance by Supplier;
- Any and all claims by or on behalf of Supplier’s subcontractors, vendors, employees or agents.

In the event that Pentair’s customers or others sue or threaten to sue Pentair, Supplier and/or other parties (individually, a “Product Liability Action”) alleging that Supplier’s services or products, alone or in combination, caused personal injury, death and/or property damage; Pentair and Supplier will cooperate with each other in managing and defending Products Liability Actions. Note that such cooperation shall in no way limit Supplier’s defense, indemnity and hold harmless obligations as described above.

Suppliers are required to maintain appropriate insurance policies including without limitation commercial general and products liability insurance policies as specified by Pentair from time to time. Pentair shall be named as additional insured on such policies. At all times including at start of the relationship, Suppliers must work with their Pentair contact to determine the correct policy coverage’s and amounts.

3.15 COUNTERFEIT PARTS

Counterfeit parts, either mechanical or electrical, are defined as suspect parts that are either copies or substitutes without legal right or authority to do so whose material, performance, or characteristics are knowingly misrepresented by a Supplier in the supply chain.

Pentair Suppliers are responsible for ensuring that the components provided or used in assemblies provided to Pentair are not counterfeit. All components should be purchased new and directly from the original component manufacturer or from their authorized distributors.

Suppliers must have documented formal procedures for selecting, approving, and monitoring their Suppliers. As part of the procedures Suppliers should address control, disposition, and reporting of counterfeit material.

4.0 MATERIALS & LOGISTICS

4.1 DELIVERY

Suppliers are required to provide goods on time to all Pentair locations, including third party drop shipments. Pentair standard delivery terms are:

In-country → Three (3) business days early, 0 days late
International → Ten (10) business days early, 0 days late

Suppliers are expected to coordinate flow of material and information to Pentair. Suppliers should be flexible, provide short lead-times and respond to material or schedule changes when necessary. New business opportunities for both Pentair and our Suppliers depend on our ability to quickly meet customer delivery requirements. Suppliers must continually remove waste from the delivery flow through electronic data interchange (EDI), engineering support, Vendor Managed Inventory (VMI), materials agreements, packaging improvements, etc.

4.2 SHIPPING TERMS

Suppliers will be expected to ship under most recent revision of Incoterms. Our standard expectations are as follows:

For domestic purchases → EXW for freight-collect and DAP for freight-prepaid terms.

For international purchases → FCA for freight collect and CIP for freight-prepaid terms.

Site demands may vary. Suppliers should consult their Pentair buyer to determine appropriate terms and carrier routing instructions.

4.3 MARINE (CARGO INSURANCE)

The party responsible for paying the main transportation shall provide full cargo insurance coverage – defined as door-to-door, 'A' cover, all risk, marine, war, strike and riot – regardless of the shipping terms, with the exception of CFR/CPT Incoterms, in which insurance is the buyer's responsibility. Therefore, on E and F terms, plus CFR and CPT, the buyer shall provide full cargo insurance coverage, and on D terms, plus CIF and CIP, the seller shall provide full cargo insurance coverage.

For destinations and/or cargo on which governmental or insurance restrictions require additional approvals and/or premiums, or a split in coverage other than house-to-house, the responsible party/parties shall take such additional measures to ensure that the shipment is appropriately covered.

4.4 LABELING AND PACKAGING

Suppliers shall package and mark all products in accordance with applicable drawings, specifications, purchase orders, and regulatory requirements. Suppliers must advise and work with the appropriate Pentair contact to understand packaging and labeling requirements. All products shall be shipped in packaging that provides adequate protection during shipment and storage.

Finished good product must be shipped on compliant heat treated pallets (ISPM 15 compliant). All pallets should be clean, in good condition, and without protruding nails, wood, dirt, etc. Containers on pallets shall not overhang the edge of the pallet.

For specific packaging requirements, please refer to the PPAP and/or equivalent approval documentation.

Packing peanuts and similar types of loose fill material are strictly prohibited. Barcode labeling, if required, must be applied in a readily accessible and visible spot on the container. The barcode label must be free of smudge marks, grease, and other markings or materials that can prevent Pentair from properly scanning the label.

All shipments to Pentair shall include the following:

- Packing slip including part number, part revision, part description, Harmonized Tariff Schedule (HTS) number (unless otherwise identified on the commercial invoice), PO number, PO Line number, ship quantity, number of containers, ship from and to address, shipment date, Supplier lot number, Supplier name, and note if parts are for PPAP, engineering parts, or parts made after a corrective action change.
- Each part number shall be packaged and identified separately
- Each container shall be marked with the order number, quantity, part number, and revision of the contents so that it is visible from the outside of the packaging
- Certifications/Material Test reports as required (Material, Plating, Hardness, etc.)
- BOL's must have accurate weights, correct NMFC #'s and freight classes.

4.5 INVOICING

Invoices submitted to Pentair for payment should be clearly printed and include all necessary information required for prompt processing and payment, including Country or Origin and Harmonized Tariff code, unless otherwise identified on the packing slip. Invoice details should include all information specified by the Pentair company purchasing the product. Any applicable taxes and shipping/handling fees should also be clearly indicated on invoice documents. Pentair will not make any payments prior to receipt and review of invoices.

4.6 REQUEST FOR QUOTATION

Suppliers must carefully review Pentair drawings and related specifications to ensure they understand and can meet all requirements. If clarification of requirements is needed, contact Pentair before submitting a quote, building tooling, or producing samples or production parts. In no case shall drawings or specifications be superseded by informal agreements. All production part issues that are not covered on the existing drawings or specifications shall be communicated by Pentair through a purchase order, a revised drawing, or a Pentair approved deviation. All development part design agreements between the Supplier and Pentair will be documented by Pentair. No verbal agreements will be accepted.

4.7 PURCHASE ORDER TYPES

Purchase orders (“P.O”) may be presented in the form of traditional P.O., pull signal, Vendor Managed Inventory (VMI), etc. and will be initiated by Pentair’s authorized buyers. The part number and revision number of the purchased material or service will be presented on the purchase order. Purchase prices are subject to the latest acknowledged quotation or the mutually agreed Supplier Agreement.

4.8 PAYMENT TERMS

Pentair’s standard payment terms are 2% 30, net 90.

4.9 SUBCONTRACTOR PURCHASING

Suppliers are expected to establish and maintain controls on the purchase of product or services used in the manufacture of product to ensure conformance to specified requirements. Purchasing Controls include evaluation and selection of Suppliers to pre-determined criteria, verification of purchased products or services, monitoring of Supplier performance (including CAPA), change control and documentation requirements.

Pentair may choose to evaluate Suppliers’ sources to ensure the purchased product or service meets specified purchase agreements. In the event that, with Pentair’s knowledge and written approval, Supplier subcontracts/outsources a portion of the manufacture and/or inspection of products to sub-tier Suppliers, the expectations described in this manual are expected to be passed on to those Suppliers. Suppliers are expected to remain responsible for all acts or omissions of their sub-tier Suppliers.

The primary Supplier (Supplier to which the P.O. is granted) shall be responsible for:

- Communicating Pentair product specifications;
- Providing final product to Pentair’s product specifications;
- Addressing quality issues for subcontract and finished product (includes verification of effective process);
- Maintaining copies of all subcontracted secondary process certifications, including but not limited to plating, annealing, cleaning, polishing, testing, and inspection;
- Ensuring subcontractor compliance with confidentiality and intellectual property requirements and with this Guide.



5.0 SUPPLIER QUALIFICATION & PERFORMANCE

Supplier qualification ensures that our Suppliers have documented and effective systems in place to help produce a consistent, quality product or service that meet all Pentair specifications and requirements.

5.1 QMS REQUIREMENTS

The Supplier must maintain an effective documented Quality Management System that communicates, identifies, coordinates, and controls all key activities necessary to design (if applicable), develop (if applicable), produce, deliver, and service products to Pentair.

The Supplier shall be certified/registered to one of the following international quality management standards by a recognized, independent, and accredited third party certification/ registration body:

- ISO 9001
- IATF 16949 (Automotive)
- AS9100 (Aerospace)

If the Supplier doesn't hold a 3rd party certification, Pentair will conduct an onsite assessment to identify and highlight any risks to providing a consistent quality product.

Additionally, Pentair, at its sole discretion reserves the right to:

- Invite customers to participate in relevant audits;
- Disqualify, demote, adjust Supplier segmentation status, requiring full requalification prior to resuming business and/or shipment with Pentair;
- Notify third party certification/registration body used by the Supplier in case of the breach/ misuse of its Quality Management System.

5.2 RISK ASSESSMENTS

Pentair is, at all times, entitled to perform assessments at the Supplier's manufacturing location(s). During these assessments, Pentair shall have access to all Supplier facilities and relevant supporting documentation. Any exceptions must be agreed upon prior to the start of the assessment. These same rights shall be extended to all Supplier subcontractors that provide material/components which go into Pentair products.

Pentair's Risk Assessment includes questions from a broad range of topics including: Management, Environmental, Health & Safety, Quality, Operations, Capacity and Supplier Management.

Suppliers are required to rate themselves on each question and complete other relevant sections as defined by the Pentair Supplier Development Team. If necessary, an onsite assessment will be conducted by the Supplier Development Team to review supporting documentation.

At the conclusion of the onsite assessment, Supplier's will be provided a summary report with key findings highlighted along with a prioritized action plan. A baseline score will also be calculated and used for improvement tracking.

The Lead Auditor will use the following classifications when communicating the results of the assessment within Pentair:

- **Approved** – Supplier has a well-defined quality and safety management system. Processes are in place to ensure the production of a consistent quality product. All critical questions have an acceptable rating.
- **Conditional Approval** – One of more critical questions do not have an acceptable rating. Some key gaps in other areas of process control have been identified, but the Supplier has displayed a willingness to complete the necessary actions in order to be a Pentair Supplier.
- **Rejected** - Major gaps in process control and likelihood of producing inconsistent product. Supplier does not appear open or willing to put in the necessary processes or controls to reduce risk.

5.3 SUPPLIER SELECTION

Pentair follows an open quoting process that allows all companies, regardless of nationality, size, and experience, the same chance to offer us their products and services. Our Suppliers are selected based on their capability, quality assurance, delivery, customer service, total cost of ownership, design & development, manufacturing, strict adherence to ethics and legal compliance, and ongoing business management and communication.

5.4 PERFORMANCE EXPECTATIONS

Pentair invests significant time and resources towards improving Supplier performance with the goal of achieving Zero Defects and ninety five percent (95%) on time delivery from all Suppliers.

5.5 SUPPLIER DEVELOPMENT

Pentair's Supplier Quality Development team follows a series of defined processes to help identify systemic problem Suppliers that need quality or delivery improvements. Systemic problem Suppliers are subject to any or all of the following:

- Onsite Assessment
- Controlled Shipping (see 6.6)
- Kaizen Events
- Root Cause Counter Measure (RCCM)

Quality Improvement Plan presentation by the Supplier at their location or designated Pentair manufacturing site.

5.6 SUPPLIER SCORECARDS

Pentair monitors the quality and delivery performance of all direct material Suppliers. Additional KPI's are also evaluated based on Supplier spend or segmentation status. These include, but is not limited to:

- Supplier Rank within PPM Grouping
- Payment Terms
- Responsiveness
- Supplier Assessment Score
- Lead Time
- Dunn & Bradstreet indicators

It is recommended that Suppliers measure their own performance on all KPI's tracked by Pentair as they are closely tied to Supplier segmentation. Failure to meet Pentair's performance requirements can result in, but is not limited to, new business hold and/or phase out.



6.0 QUALITY SYSTEM EXPECTATIONS

6.1 MATERIAL TRACEABILITY & QUALITY RECORDS

Suppliers are expected to establish and maintain a process for identifying and tracking Product during all stages of receipt, internal processing, test, storage, distribution, and shipment. Traceability to the lot / batch level is expected for but not limited to the following:

- Materials
- Process information
- Shipments

Items requiring traceability shall be identified during the development phase of a project. Where traceability is required, Pentair will work with the Supplier to develop an acceptable system. The requirements for traceability of relevant items will be communicated to the Supplier through specifications and drawings. The Supplier shall retain the appropriate quality records to support any requests made by Pentair.

Supplier's certification, process, test and/or inspection data shall be provided to Pentair, upon request, and shall be retained by the Supplier for fifteen (15) years, based on Pentair and/or Pentair customer requirements, after delivery of the relevant products. This requirement does not supersede any regulatory or statutory requirements for records retention.

Any exceptions should be brought to the attention of Pentair in writing, for prior approval by Pentair.

6.2 HANDLING, STORAGE & DISTRIBUTION

Suppliers are expected to have systems in place to ensure that damage, deterioration, contamination or other adverse effects do not occur during the handling, storage and distribution of Product(s).

6.3 TOOLING MANAGEMENT

Suppliers are responsible for assuring Pentair-owned tooling is capable of producing product within specifications at all times. Suppliers shall also have methods in place for the proper handling, care, maintenance, and use of Pentair owned tooling and fixtures.

Tooling and fixtures should be clearly marked with the Pentair name and tool number. Suppliers are also expected to maintain tool maintenance logs and be able to provide them to Pentair when requested. Suppliers must use Pentair's Tool Log or an approved equivalent. Pictures of all tooling are required. Instructions are included in Pentair's Tool Log on how to properly identify tooling during the photographing of tools.

Suppliers shall immediately notify Pentair when a tool is damaged or approaching its end of life. Notification must be in time to repair or replace the tool without interruption to continuous production.

6.4 NONCONFORMING MATERIAL

If non-conforming products are identified after shipment from the Supplier, one or more of the following immediate containment actions shall be initiated, based on mutual agreement between Pentair and the Supplier, and subject to Pentair's sole and final decision.

1. The Supplier shall inspect and sort products with unidentified status at any defined place (Pentair, Supplier, Pentair's customer, or others). All costs incurred will be at the Supplier's expense.
2. The suspected batch/ lot/ shipment will be retained for one or more of the following actions:
 - a) Supplier's immediate replacement of the Product;
 - b) Return of batch/lot/shipment to the Supplier, with the condition of complete replacement, sorting or rework of the products, and any other charges incurred, at the Supplier's expense;
 - c) Third-party sorting organized at any site specified by Pentair, at the Supplier's expense;
 - d) Supplier sorting at Pentair site, at the Supplier's expense;
 - e) Scrap, loss, and any other additional costs incurred by Pentair, as a result of Non-conforming Products, are at the Supplier's expense.

It is Supplier's responsibility to deliver high quality products to Pentair.

6.5 CORRECTIVE ACTION

Pentair issues CAR's based on issue criticality, impact to Pentair product and repetitive. When a corrective action request is issued, the Supplier shall submit a formal written response to address the specific defects identified.

- The general format of the corrective and preventive action will be a Corrective Action Report form (8D), unless otherwise agreed upon in advance by Pentair.

- The Supplier shall document and implement containment action (steps D1-D3 of the 8D form) within 1 working day (from CAR receipt). Containment action must be submitted to Pentair for review and approval.
- If Pentair disagrees with the Supplier's containment action, the Supplier must respond (with a revised containment action) within 1 working day (starting from Supplier's receipt of Pentair's notice).

Failure analysis leading to the root cause determination shall be done within five (5) working days or at an alternative time-frame agreed upon in advance.

- The Supplier shall use appropriate tools such as, but not limited to, fishbone diagram, 5 Why, FTA (Fault Tree Analysis) to determine root cause.
- The 8D form will not be considered complete until all proposed corrective and preventive actions and an appropriate implementation plan has been approved by Pentair.

Involvement of Pentair in the approval of remedial action does not change the fact that the Supplier remains responsible for the product non-conformity, including any additional non-conformances resulting from the implementation of the remedial action.

6.6 CONTROLLED SHIPPING

In the event of recurring non-conformances where the corrective action plan has failed, Pentair reserves the right to issue a Controlled Shipment (CS) program at the Supplier's site for specified products, and at the Supplier's expense.

CS1 includes, but is not limited to:

- One hundred percent (100%) sorting/inspection on the products, which shall be carried out on every shipment/part/lot/batch, prior to shipment to Pentair;
- Sorting/ inspection records to be attached to each shipment/lot/ batch;
- Supply of data and documentation on the products, upon request from Pentair;
- Visit/audit by Pentair;
- Dialogue with Supplier's management team, upon request from Pentair.

In order to safeguard Pentair's interest, if there is a failure to successfully achieve CS1, it will automatically be escalated to CS2.

CS2 includes, but is not limited to:

- All CS1 measures listed above, which will be inspected by a Pentair-designated third party or by Pentair (at the Supplier's expense);
- Blocking of new business, subject to the sole and final decision of Pentair.

The Supplier may be notified of additional requirements, when needed by Pentair.

Exit from CS1 and CS2 will be determined by Pentair, when set criteria are met and corrective actions are implemented and validated.

6.7 COST RECOVERY

Pentair reserves the right to seek reimbursement for costs incurred due to Supplier responsible issues. Supplier responsible issues include:

- Failure to deliver parts within the agreed upon lead time that causes a production line stoppage at a Pentair manufacturing location;
- Nonconforming product identified by a Pentair external customer;
- Nonconforming product identified within a Pentair manufacturing site;
- Unapproved changes – failure to notify Pentair of changes as identified within the PPAP process.

Cost recovery is a collaborative effort between the Supplier and Pentair.



7.0 PRODUCT REALIZATION

Pentair has a defined Product Development Process for product realization. This process is called 3D (Discover, Develop and Deploy) and is a scalable innovation process that helps prioritize new (or) existing product investment opportunity and drive growth.

7.1 SUPPLIER EXPECTATIONS

In planning product realization, the Pentair Representative will communicate customer expectations and Supplier involvement during the 3D process. The 3D phases are defined as follow:

- **Discover:** Evaluate potential projects to determine if they align with the strategic goals of the business, and if the commercial benefits of the project justify the investment to bring product to market.
- **Develop:** Product ideas and manufacturing process plans are refined, tested, further refined and finalized. Product documentation is completed concurrently with the drafting of sales, marketing, and manufacturing process plans. Suppliers shall provide direction to their manufacturers of the tooling, capital equipment, assembly cells and/or gauging to proceed. The Supplier shall collect data required to ensure that the manufactured items meet drawing, specification and capacity requirements before approval to ship is given. The critical activity in this phase is the first parts off review, by the Supplier, and subsequent tuning of the process to produce components/ material that conform to the drawings and specifications.
- **Deploy:** Once final project capital is approved, the approved deployment plans are followed through to the product launch. During this phase, sales and marketing plans are finalized and manufacturing plans are implemented and validated. The manufacturing, supply chain, sales, transportation, marketing and service infrastructure are put into place to officially launch the product. This phase is the final Product and Process Validation and Launch stage of the process. During this period the Supplier shall complete and submits a PPAP documentation requested by Pentair Representative.

Pentair's project team will define component priority during the 3D process. Suppliers shall provide regular status reports for all new products with regard to meeting the program objectives of quality, cost, performance and timing. All Suppliers, regardless of component priority, shall use a disciplined launch and APQP process.

7.2 PRODUCTION PART APPROVAL PROCESS (PPAP)

The purpose of the Production Part Approval Process (PPAP) is to provide Suppliers with an established approach that ensures products manufactured for Pentair are produced utilizing processes which are consistently capable and minimize risk producing nonconforming products. Suppliers are required to submit PPAP documentation when requested by Pentair Representative(s).

The PPAP process ensures products are capable of meeting Pentair's technical and performance needs. This process must be completed and accepted prior to the start of production, and shall be scheduled and executed in accordance to a timeline agreed upon with Pentair. Suppliers shall not manufacture or ship any products until Full or Interim Approval is received from Pentair. Approval is communicated, through a signed Part Submission Warrant (PSW). Any discrepancies must be resolved prior to PPAP submission date.

The Pentair Representative will document the review determination and communicate the results to the Supplier:

- **Full Approval:** If all information required on the part, material or sub-part is found to be accurate, complete and within specification, per the submission requirements defined by the Pentair Representative. The "Approved" box on the bottom portion of the Submission Warrant and then sign the PPAP Warrant Checklist form. Full approval allows the Supplier to ship production quantities of product.
- **Interim Approval:** This approval category is intended to temporarily approve the PPAP contingent upon effective controls and/or corrective actions implemented to prevent discrepancies from reaching the customer that may affect fit, form, function or durability. Interim approvals are valid for a maximum of 60 days.
- **Rejection:** A PPAP will be rejected if any information is found to be inaccurate, incomplete or outside the specification limits, per the submission requirements defined by the Pentair Representative. The "Rejected" box on the PPAP submission warrant, and then sign the PPAP Warrant Checklist form.

In a case where full approval is not granted, Pentair will advise the Supplier of the areas of concern and work together on suggested corrections. The Supplier shall make corrections accordingly and resubmit the PPAP. Pentair reserves the right to determine if any or all of the PPAP items are to be reviewed on-site, and/or at the Supplier facility.

Suppliers shall review and analyze PPAP results prior to send signed warrant to Pentair. A signed PPAP by Suppliers affirms the warrant and product meet all Pentair requirements. It further affirms samples were produced PPAP shall be performed on parts produced using normal production tooling, equipment, speeds, settings, methods, technique, and personnel. Lastly, it certifies documented evidence of such compliance is on file and available for Pentair's review upon request.

Pentair Representative will determine the appropriate PPAP requirements and approval levels. Pentair follows PPAP approval documentation retention and submission requirements listed within AIAG manual PPAP "Production Part Approval Process".

Understanding the variation and criticality of products Pentair procures, certain PPAP may use minimal approval requirements such as the ones listed below:

- **First Article Inspection-** When purchasing items such as stock fasteners, literature, catalogue items. This would require a Submission Warrant and First Article.
 - *Note- fasteners determined to be critical shall be managed using the PPAP approval levels. Additionally, fasteners sourced from Suppliers without known quality (TS/ISO, Industry Recognized Leader) shall be managed using the PPAP approval levels.*
- **Lot Inspection-** Where purchasing product for very small volume or custom/one-time projects.
- **Bulk Materials-** In the event of bulk (truckload, silo, Gaylord...) purchase of items such as resins, paint, epoxy.

In the case of disagreements, concerns or queries about the PPAP, it shall be addressed through Pentair's Representative and subject to the final decision of Pentair.

Suppliers shall not make any changes to the product or process, after PPAP approval from Pentair. If changes are needed after PPAP is completed, the Supplier shall contact Pentair's Representative to discuss the request for process change. Suppliers shall also submit the specified documentation according to Pentair's requirements.

Regardless of PPAP documents requested to be submitted to Pentair or not, all PPAP documents shall be created, utilized, and retained by the Supplier for the life of the product, unless otherwise specified by Pentair. A PPAP shall be provided for each part/family in the approval process.

A Critical Characteristic is any feature of a material, process, part, assembly, or test that has a significant influence on Product fit, form, function or any other expected deliverable, as specified by Pentair.

Critical Characteristics shall also include all relevant regulatory and statutory requirements, but are not limited to such.

Pentair will select or identify these Critical Characteristics, which the Supplier needs to control. Critical Characteristics will be communicated through various methods, including: Notations and/ or symbols documented on Pentair engineering drawings, specifications, and PPAP Worksheet.

It is the responsibility of the Suppliers to ensure all drawings and specifications used to produce the product are of the latest Pentair revision.

7.3 SAFE LAUNCH FOR CRITICAL COMPONENTS

A cross-functional launch support team at Supplier location is recommended. Pentair requires Suppliers to put in place a safe launch plan with increased frequency inspection for each defined critical component, and defined immediate action to be taken if an out of control and/or out of specification condition occurs.

This process is intended to prevent potential non-conformances during the start-up of production after PPAP approval. Safe Launch Plan shall be communicated and agreed (between Pentair and Supplier) to meet either a defined period of time or number of lots. Parts shipped under this defined period, shall be clearly identify on each box, bag, and/or container.

7.4 PART RECERTIFICATION

Pentair may require Suppliers or parts that have been inactive for more than one year (ex: no receipts of a specific part number within a 12 month period) to be re-qualified before a new order is placed. If re-qualification is required, Suppliers may be asked to provide updated company information and/or evaluation samples and documentation.

To prevent quality degradation, an annual re-certification may be required for critical parts, as defined by Pentair. Related costs are the Supplier's responsibility.

7.5 RECOMMENDED PPAP RESOURCES

Pentair is a member of the Automotive Industries Action Group (AIAG) and encourage Suppliers to follow AIAG PPAP guidelines, tools and training for a deeper understanding of PPAP elements and requirements specified in the PPAP manual. The following publications are available from the Automotive Industry Action Group (AIAG). These may be ordered on-line at:

<http://www.aiag.org>

7.6 CHANGE MANAGEMENT

After receiving initial Product approval from Pentair, Suppliers shall not make any changes to the product and processes without prior written notification and agreement with Pentair. Suppliers shall follow this requirement across its entire supply chain.

Changes include, but are not limited to:

- Any Product changes;
- Any material or material composition changes in the Product;
- Changes to regulatory, statutory or legal status/documentation requirements;
- Any manufacturing process changes (including testing and inspection);
- Moving production equipment internally within the facility;
- Moving production equipment to other facilities/locations;
- Change of production process;
- Production material changes;
- Change in material's Country of Origin (COO);
- Minimum order quantity changes;
- Change of process parameters outside of previously approved operating parameters;
- Packaging or changes that alter the dimensions of the pallet or order quantity;
- Switch to noncompliant wood pallets, crates, or dunnage;
- New production equipment;
- Moving products or parts to other Supplier(s);
- New or changed parts purchased by Supplier.

Supplier's non-compliance with the above requirements is considered a breach of agreement made between Supplier and Pentair. For any change, Pentair reserves the right to requalify the Product with an appropriate PPAP. Any change is subject to sole and final written approval from Pentair.

7.7 SUPPLIER DEVIATION REQUEST

Deviations shall be documented to formally request for Supplier's manufacturing, packaging, material, and process deviation change that deviate from Pentair products' specifications.

All deviation requests shall be approved by Pentair prior to shipment of product and it must outline reason, time period or quantity, analysis (root cause and corrective actions), and disposition of potential changes. Parts shipped under this defined period, shall be clearly identify on each box, bag, and/or container.

Note: Depending on the magnitude of deviation, Pentair may request the product/process to be re-PPAP to ensure process validation.



APPENDIX A: ACRONYMS

8D	Eight Disciplines of Problem Solving
AEOP	Authorized Economic Operator Program
AIAG	Automotive Industry Action Group
APQP	Advanced Product Quality Planning
AS	Aerospace Standard
BOL	Bill of Lading
CAPA	Corrective and Preventive Action
CAR	Corrective Action Report
CBP	U.S. Customs & Border Protection
CCF	Creating Continuous Flow
CFR	Cost and Freight
CIF	Cost, Insurance, Freight
CIP	Carriage and Insurance Paid
COO	Country of Origin
CS	Controlled Shipping
CT-PAT	Customs-Trade Partnership Against Terrorism
DAP	Delivered at Place
EDI	Electronic Data Interchange
EINECS	European Inventory of Existing Commercial Chemical Substances
ELINCS	European List of Notified Chemical Substances
EU	European Union
EXW	Ex Works
FCA	Free Carrier
FMEA	Failure Modes and Effects Analysis
FTA	Fault Tree Analysis
GCC	Gulf Cooperation Council
GCM	Global Commodity Manager
GSG	Global Supplier Guide
HTS	Harmonized Tariff Schedule
ISF	Importer Security Filing

ISO	International Organization for Standardization
ISPM	International Standards for Phytosanitary Measures
ITAR	International Traffic in Arms Regulations
KPI	Key Performance Indicator
LTL	Less Than Load 28' or 53' truck (I.E. USF Holland, Fedex Freight, YRC)
MMF	Making Material Flow
MSA	Measurement Systems Analysis
MSDS	Material Safety Data Sheets
NMFC	National Motor Freight Classification
OECD	The Organization for Economic Co-operation and Development
OSHA	Occupational Safety and Health Act
PBBs	Polybrominated Biphenyls
PBDEs	Polybrominated Diphenyl Ethers
PIMS	Pentair Integrated Management System
PO	Purchase Order
PPAP	Production Part Approval Process
PPM	Parts Per Million
PSW	Part Submission Warrant
QMS	Quality Management System
RCCM	Root Cause Counter Measure
REACH	Registration, Evaluation, Authorization and Restriction of Chemicals
REF	Reference
RoHS	Restriction of Hazardous Substances
SA	Scheduling Agreement
SEC	U.S. Securities and Exchange Commission
SPC	Statistical Process Control
TL	Truckload 48' or 53' truck (I.E. Werner Enterprises, Schneider National)
TS	Technical Specification
VMI	Vendor Managed Inventory

APPENDIX B: TERMS, DEFINITIONS & REFERENCES

8D: The eight disciplines (8D) model is a problem solving approach with a purpose is to identify, correct, and eliminate recurring problems, and it is useful in product and process improvement. The approach establishes a permanent corrective action based on statistical analysis of the problem and focuses on the origin of the problem by determining its root causes. Pentair has adopted the 8D format to be used for both internal and external problem solving activities.

Capability: The maximum amount of variation inherent in a manufacturing process. Improving process capability involves taking steps to limit the amount of variation to defined acceptable limits and thus bring the process into control.

Capability Index: Determines if a process is capable of producing to the defined product specification.

Conflict Minerals: Minerals mined in conditions of armed conflict and human rights abuses, and which are sold or traded by armed groups.

Control Plan (CP): A document that identifies key Manufacturing process steps, critical inputs to and critical variables of such steps, and that defines process monitoring control strategies and tools.

Corrective Action Request (CAR): A formal request by Pentair to take action to eliminate the cause(s) of an existing nonconformity or other undesirable situation in order to prevent recurrence.

Cpk: The capability index, which accounts for process capability centering, and is defined as the minimum of Cp Upper or Cp Lower. It relates the scaled distance between the process mean and the closest specification limit to half the process spread.

Note: Cpk is able to describe short term process capability, particularly from a PPAP. However, analyzing Cpk values by itself is not sufficient to understand process capability. Cpk and Ppk must be analyzed together to understand short and long term process capability.

Critical Characteristic: A characteristic that can infringe on safety or regulatory compliance or customer satisfaction, or a characteristic that can cause rework or scrap AND at the same time is sensitive to variation that is difficult to control within the process.

Customer: Pentair or the customers of Pentair.

Deviation: Deviations are manufacturing/production changes that deviate from a customer's contracted manufacturing specifications. Deviations bare no limit on severity or magnitude. Instead, they can be even the smallest of changes, but regardless of how big of a change, deviation management is extremely important to the quality of the product.

Failure Mode and Effects Analysis (FMEA): A preventive analytical technique to methodically study the cause and effects of potential failures in a product or process. The product or process is examined with a cross-functional team for all the ways in which a failure can occur. For each potential failure, an assessment is made of its effect on the system and its severity. Ultimately, a review is made of the action being taken (or planned) to reduce or eliminate the probability and the effects of the failure.

Gage Repeatability and Reproducibility (Gage R&R): Statistical measure to analyze how much variation exists in a gauge, measurement or test equipment.

Global Supplier Guide: This Global Supplier Guide and its appendices.

Non-conformance or Nonconformity: A Product or Service that does not meet requirements found in Pentair contracts, drawings, specifications, policies or with any other legal, statutory, regulatory or Pentair requirements.

On Time Delivery: The number of purchase order line items delivered on time to the required date and quantity divided by the number of total purchase order line items required.

Part Submission Warrant (PSW): The Part Submission Warrant contains Supplier, Product information, required documentation, the Supplier application warrant, and Pentair disposition. A submission approval by Pentair authorizes Supplier to start production.

Parts Per Million (PPM): A measurement of the defect rate in a product, calculated as: $PPM = (\text{Total number of defective parts} / \text{Total number of parts received by Pentair}) * 1,000,000$

Ppk: The performance index, which accounts for process performance centering, and is defined as the minimum of PP Upper or PP Lower. Pp and Ppk are for "long term" studies. If Cpk is approximately equal to Ppk, the process is in statistical control. On the other hand, if Cpk is significantly different that Ppk, the process is not in statistical control.

Process Capability: The range over which variation of a process occurs as determined by the system of special and common causes. Note: Before performing capability calculations, special variation must be removed or statistical probability will be void.

Production Part Approval Process (PPAP) Order: A document intended to clearly identify requirements and eliminate ambiguity between Pentair and the Supplier, prior to production of new or changed parts. It identifies to the Supplier, part information, Special Characteristics, qualification requirements, Pentair authorization and Supplier sign off.

Products: Any finished or semi-finished goods, parts, components, materials and/or services manufactured for delivery or delivered to Pentair.

Qualification: Activity and analysis performed to demonstrate adherence to predetermined criteria. Qualification for a Product means Product testing or inspection conducted according to an approved and controlled protocol to ensure the Product meets Specifications.

Records: Written or electronic accounts, notes, data, record of, and information and results obtained from performance of services of all work done under the Quality Management System, this Manual, or agreements.

Safe Launch Plan: A demand to Supplier in order to put in place redundant inspections and containment processes to prevent potential non-conformances during the start-up of production after PPAP approval.

Specification: Any requirement with which a Product, process, Service, or other activity must conform.

Statistical Process Control (SPC): Application of statistical methods such as control charts to analyze a process and determine appropriate actions to take to achieve and improve statistical capability.

Supplier: A provider of Products or Services to Pentair.

REFERENCES:

- AIAG/reference manual APQP “Advanced Product Quality Planning and Control Plan”
- AIAG/reference manual MSA “Measurement Systems Analysis”
- AIAG/reference manual SPC “Statistical Process Control”
- AIAG/reference manual FMEA “Potential Failure Mode and Effects Analysis”
- AIAG/reference manual PPAP “Production Part Approval Process”

APPENDIX C: NORTH AMERICA SUPPLIER ROUTING GUIDE

TRANSPORTATION ROUTING OVERVIEW

Pentair Routing Guide provides Pentair Suppliers with the specific instructions to properly execute shipments and has been put in place to streamline Pentair's supply chain to maximize operational efficiencies. It is required that the suppliers follow the routing instructions when shipping to a Pentair facility.

GENERAL TRANSPORTATION REQUIREMENTS

Packing Slip (PS) Requirements:

Truckload (TL) and Less Than Load (LTL) Shipments

- The packing slip is mandatory and must accompany each shipment.
- Presented in a clear plastic envelope and attached to the outside of the pallet.
- Create a packing list for each Purchase Order (PO) and Scheduling Agreement (SA) on a shipment.
- Clearly identify shipment contents with Pentair's part # and pallet level detail.
- Label the contents on each pallet.
- Shipment manifest – when shipping multiple PO's or SA's to a Pentair Consolidation point, please provide a manifest listing that reference the PO or SA number and pallet count for each shipment.

Small Package Shipments

- Same requirements as listed for the TL and LTL shipments with additional requirements:
- When shipping multiple boxes and the packing slip is not attached to the outside of the box, you must note which box contains the packing slip (PS).
 - If shipping multiple cartons, the label must specify the ("x of y" or "1 of 5"), etc.
 - Reference field 1 contains the Pentair PO or SA #

Bill of Lading (BOL) Requirements:

- Pentair requests its suppliers to use the industry standard VICS BOL.

- PO/SA #'s - The applicable PO/SA number(s) must be entered on packing slips for all shipments, and on the bill of lading for LTL and Truckload carriers and labels for Small Package carriers.
- Actual freight classes with correct weights.
- Carton and pallet count.
- National Motor Freight Classification freight index. An NMFC code book can be purchased at <http://www.nmfta.org/Pages/Nmfc.aspx> or you can ask your local LTL carrier and they might help you classify the product.
- Hazardous materials must be labeled in accordance to the DOT requirements.
- Pro # for LTL shipments or trailer and seal # for truckload.
- Multiple PO's/SA's shipped on the same day to the same destination (Plant, Warehouse etc.) must be combined onto a single Bill of Lading.
- When shipping to the Juarez facilities, BOL must be marked with "1029" for Plant 1 or "1030" for Plant 2 depending on the ultimate destination.
- A single BOL must not exceed a single trailer.
- All imports shipped with wood (crating, pallets, dunnage) must be shipped in accordance to the ISPM 15 standards.
- Physical ship from address.

Freight Terms:

Domestic suppliers must ship product to Pentair using the freight term Collect, Third Party in the case of small package shipments or when shipping to a non-Toro facility.

Third Party Shipments

- Freight bills must be sent to: Williams and Associates

Prepaid or Prepaid and Add Shipments

- Suppliers may not ship product prepaid or add freight costs to the invoice, unless prior written authorization has been provided.

Collect Shipments

- Freight must be ready to load on the scheduled pick-up day.
- You must ship on one of Pentair's preferred carriers
 - **Small Package**
 - FedEx small package
 - **Less Than Load (LTL) and Truckload (TL)**
 - Contact the receiving location or your material's planner for carrier routing.

Shipment Modes:

Truckload (TL) –

- Shipments weighing over 14,000 lbs.
- Shipments that exceed 20 linear feet of trailer floor space.
 - Contact the receiving location or your material's planner for carrier routing

Less Than Load (LTL) –

- Shipments weighing between 200 lbs and 13,999 lbs.
- Shipments less than 200 lbs. that cannot be shipped small package due to size or damage issues.
- Shipments cannot exceed 14 linear feet of trailer floor space.
- Contact the receiving location or your material's planner for carrier routing

Ocean (FCL or LCL)

- Contact the receiving location or your material's planner for carrier routing

Small Package ground – 0 to 199 lbs.

- Individual package weight up to up to 70 lbs.
- Packages can be up to 250 inches in length and girth combined. They can also be up to 108 inches in length. Oversize packages and packages with a large size-to-weight ratio should be shipped LTL.

How To Measure Your Package Size

To measure ground packages use the following formula:

$\text{Length} + 2x \text{Width} + 2x \text{Height}$

Step 1. Determining Length

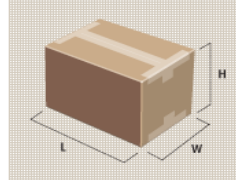
- Measure the longest side of the package, rounding to the nearest inch. This is your length.

Step 2. Determining Girth (2x Width + 2x Height)

- Measure the width of the package, rounding to the nearest inch. Multiply this number by 2.
- Measure the height of the package, rounding to the nearest inch. Multiply this number by 2.
- Add these two numbers together. This is your girth.

Step 3. Add the length and the girth together. This is your package measurement.

Step 4. Weigh the package to obtain its actual weight.



FedEx or a compatible shipping system, you can process shipments by choosing "Bill to Third Party" from the dropdown box under "Billing Option".

- To obtain the 3rd party account # you are shipping to, please e-mail contact the receiving location for account #.

REQUIREMENTS

- REF 1 – PO or SA number

Air Shipments (small pack and heavyweight)

- Prior approval required, contact your material planner at the receiving plant for more information.

Labels and Markings:

Finish Goods

When shipping finished product to Pentair ensure that the wood pallets, crating or dunnage is ISPM 15 Certified. ISPM 15 affects all wood packaging material (pallets, crates, dunnage, etc) requiring that they be debarked and then heat treated or fumigated with methyl bromide and stamped or branded with a mark of compliance.



APPENDIX D: REVISION HISTORY & CONTACT INFO

All prior editions of this guide are obsolete and should not be used. Printed copies of this document are for reference only and shall be marked so. Suppliers should obtain and use the latest version of this document from your Pentair Supply Chain Representative.

Revision	Date	Description of Changes	Approvals
A	March 2018	<ul style="list-style-type: none">• Official release to follow Pentair doc control standards• Full re-write to remove Electrical references• Added Key Roles and Responsibilities• Compliance section updated and revised• Added Product Realization section• Update Supplier Qualification• Added Controlled Shipping and Cost Recovery• Added NA Supplier Inbound Routing Guide to Appendix	Larkin, Grohs, Severino, Gunderson, Boone, Wirth

Contact Information

For information or questions regarding this Global Supplier Guide, please contact your Supply Chain Representative or send email correspondence to:

PentairSupplierQualityDevelopmentTeam@Pentair.com