



# **MATERIALS, MANUAL, SUPPLIER QUALITY REQUIREMENTS**

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CRS-00046 Rev E

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## Crystal Group

### Corporate Overview

Crystal Group designs, builds, customizes, and supports the most trusted rugged computers and rugged systems for intelligence, communications, reconnaissance, navigation, surveillance, and critical control applications in government and industrial segments.

### Corporate Mission

Crystal Group is committed to providing our customers with high quality products and services, quickly and flexibly with unparalleled customer support. This means meeting customer requirements for product quality, service, and on time delivery. It also means anticipating our customers' future needs and expectations for new products and services with innovative designs and systems. Crystal Group aims to accomplish these objectives with strong leadership, a highly capable and empowered workforce, and partnering with best-in-class Suppliers.

### Web Page

Additional information about Crystal Group can be found at [www.CrystalRugged.com](http://www.CrystalRugged.com).

## Introduction

### Our Suppliers

Crystal Group recognizes the very important role our Suppliers have in the value we offer our customers. As an extension of our own operations, we rely on our Suppliers to provide material, products, and services which meet all of the requirements of Crystal Group contracts, applicable specifications, and the quality management requirements outlined herein.

### Purpose

Crystal Group serves diverse market sectors, such as intelligence, communications, reconnaissance, navigation, surveillance, and critical control applications in government and industrial segments. The purpose of this manual is to inform Crystal Group Suppliers of the core expectations we have regarding the Suppliers' quality management systems, design requirements, and manufacturing process controls required for the purpose of doing business with Crystal Group. This manual describes what Crystal Group expects its Suppliers to do to ensure that all Crystal Group requirements and expectations are met.

### Scope

This manual applies to all Suppliers providing Crystal Group with materials, products, processing, and related services, including intra-company Suppliers, and when applicable, to Supplier sub-tier sources. The general requirements outlined herein do not supersede conflicting requirements in the Crystal Group contract, or drawing, including applicable engineering specifications and process specifications, or applicable long-term agreement(s).

This manual specifies ***additional requirements for Crystal Group Aerospace Suppliers*** as shown in ***bold italics***.

### Requirements

In this manual, the terms "shall" and "must" mean that the described action is mandatory; "should" means that the described action is necessary and expected with some flexibility allowed in the method of compliance; and "may" and "can" means that the described action is permissible or discretionary.

## Questions

Questions concerning this manual should be directed to Crystal Group Supplier Quality Team at [CrystalSupplierQuality@crystalrugged.com](mailto:CrystalSupplierQuality@crystalrugged.com).



## Supplier Code of Conduct

Suppliers shall ensure operations are being performed in a manner that is appropriate, as it applies to their ethical, legal, environmental, and social responsibilities. Below is a listing of the basic requirements:

- **Compliance with Local Laws and Regulations**

Suppliers must adhere to the laws and regulations in the locality in which they reside. This includes all local, state, and federal laws/regulations in the country of origin.

- **Compliance with Environmental, Health, and Safety Laws**

The Supplier must maintain and operate its manufacturing/production facilities and processes in accordance with local, state, and federal laws/regulations in the country of origin.

At no time shall any Crystal Group person be exposed to hazardous materials or unsafe conditions as a result of Supplier shipments to Crystal Group, or while visiting a Supplier's location. For items with inherent hazards, safety notices must be clearly visible. As applicable, documented safety handling and protection information must be provided.

- **Product Safety**

In all instances where a product is manufactured to a new design, for a new system, or for a new application, it is important that Supplier and Crystal Group allocate responsibility for assuring that all performance, endurance, maintenance, safety and warning requirements are met. It is preferred that this allocation of responsibility be in writing.

- **Non-Discrimination**

Suppliers shall not discriminate against race, color, sex, religion, age, physical disability, political affiliation, or other defining characteristics as prohibited by local, state, and federal laws/regulations in the country of origin.

- **Labor**

- **Child Labor** – Suppliers shall employ workers of minimum legal age in accordance with local, state, and federal laws/regulations in the country of origin. Child labor laws must be followed.
- **Forced/Indentured Labor** – Suppliers shall not practice the use of forced or indentured labor.
- **Work Hours/Days** – Suppliers shall not exceed the daily and weekly working hours as permitted by local, state, and federal laws/regulations in the country of origin.

- **Wages and Benefits** – Suppliers shall compensate workers in accordance with local, state, and federal laws/regulations in the country of origin. This includes minimum legal wage, overtime wages, and benefits (required by law).
  
- **Ethics**

Evidence of corruption, bribes, improper advantage, or any other form of illegal practice by the Supplier or associated operations will terminate all relations with Crystal Group. Suppliers will conduct their business in a manner that meets the ‘Ethical Business Conduct’ guidelines of the Crystal Group.
  
- **Code of Conduct and Policy Enforcement**

This policy applies to Suppliers and their sub-tier sources. It is the responsibility of the Supplier to verify and monitor compliance of this guideline at their operations and sub-tier source operations.
  
- **Confidentiality**

The Supplier shall ensure the confidentiality of Crystal Group-contracted products and projects under development, and related product information, as well as intellectual property shared as a result of the working relationship.

## Quality System Requirements

Suppliers shall maintain a Quality Management System (QMS) suitable to the products and services provided to Crystal Group, that is certified by an accredited third-party certification body to the latest version of one or more of the following, as applicable:

- ISO 9001 – Quality Management System Requirements
- AS9100 – Quality Management System Requirements (Aerospace)
- ISO/IEC 17025 – General requirements for the competence of testing and calibration laboratories
- MIL-45208 – Inspection System Requirements

In the absence of third-party certification, depending on the product, its application, value, and criticality, the Crystal Group Supplier Quality Team may authorize the acceptance of other evidence of compliance. This may include second-party (Crystal Group) audit or first-party (self) assessment to the applicable criteria above, or to a set of alternative basic quality requirements (such as those described in a 'Crystal Group Vendor Quality Assessment' Form, FRM-00157, or FRM-00158).

**Crystal Group Aerospace Suppliers shall comply with the following requirements:**

- **Commercial-Off-The-Shelf Suppliers (COTS) - Suppliers that provide commercial products shall establish a QMS in compliance with ISO 9001, or equivalent.**
- **All Other Suppliers - shall establish and maintain QMS that is in compliance with AS9100, and a measurement management system which meets the requirements of ISO 17025.**

## Quality Manual

Upon request, the Supplier shall furnish Crystal Group with a copy of the Supplier's Quality Management System Manual, which is to be current and approved by the Supplier's management, including or making reference to related documents. The quality management system documentation shall include Supplier's statements of a quality policy and quality objectives. Top management shall define quality objectives and measurements which should address customer expectations and be achievable within a defined period of time. The Supplier shall promptly notify the Crystal Group Supplier Quality Team of any substantive changes to the Supplier's quality management system or personnel.

## Supplier Approval Process

Crystal Group requires all Suppliers to be approved prior to the issuance of contracts. All Suppliers must be approved by Crystal Group, regardless of approvals by customers or other entities.

### Supplier Assessment

The Supplier Approval Process may include the following:

#### 1. Supplier Initial Assessment

Crystal Group may request the Supplier to provide a copy of its quality management system certificate and/or complete a self-assessment of its business and quality management system and capabilities. The level of assessment depends on the type of supplier as follows:

- a. Materials – quality system, capacity, price, lead time, longevity of company, # of employees, ability to provide CofC, components traceability, and counterfeit parts program – the completion of FRM-00157
- b. Service – quality system, longevity of company, and # of employees – the completion of FRM-00158

#### 2. Documentation Audit

In those cases where a Supplier's quality management system has not been certified by an accredited certification body, Crystal Group may request a copy of the Supplier's Quality Manual and supporting procedures (and perhaps internal audit reports) to determine if the Supplier's quality management system meets Crystal Group requirements.

#### 3. On-Site Assessment

Generally, when a Supplier is certified to a related standard by an accredited certification body, Crystal Group will not conduct an on-site assessment of the Supplier's quality management system against the same criteria. However, Crystal Group and/or its customers, due to product/process complexity or criticality, may elect to conduct on-site assessments of a Supplier's product or process capabilities. As a result, findings may be issued. These assessments could include:

- Quality Management System (QMS) – if necessary, to determine whether the Supplier's quality management system meets one or more of the applicable standards and is functioning effectively.

- Technology Assessment - to determine whether the Supplier has the needed technical resources, including production and inspection equipment, facilities, engineering resources, Crystal Group-specified computer-aided design language/format, electronic commerce capability, etc.
- Sub-Tier Supplier Control – to evaluate the effectiveness of the Suppliers sub-tier management processes and how customer requirements are flowed down to the sub-tier suppliers to ensure that products or services procured from sub-tier sources and delivered to Crystal Group conform to all applicable Crystal Group requirements.

## General Requirements

The following set of general quality requirements applies to all Suppliers.

### Compliance to Contractual Requirements

Upon accepting a Crystal Group contract, the Supplier is responsible for compliance to all contract (e.g., engineering drawing, specification, purchase order) requirements. All documents, drawings and specifications, regardless of origin, are applicable to the Supplier when specified in the contract or documents referenced in the contract and are required to be used at all levels of the supply chain. Unless otherwise specified in the contract, the document revision in effect on the date of issue of the contract applies to the contract. Neither audit, surveillance, inspection or tests made by Crystal Group, representatives of Crystal Group or its customer(s), at Supplier's facilities, at any sub-tier facilities, or upon receipt at Crystal Group, relieves the Supplier of the responsibility to furnish acceptable products or services that conform to all contract requirements; nor does it preclude subsequent rejection by Crystal Group or its customers.

### Crystal Group Designated Sources

Where specified by contract, the Supplier shall purchase products, materials or services from Crystal Group- designated sources. However, the Supplier is responsible to ensure that items procured from such sources meet all applicable technical and quality requirements.

### Control of Sub-Tier Suppliers

The Supplier, as the recipient of the contract, is responsible for meeting all requirements, including work performed by the Supplier's sub-tier Suppliers (also known as Sub-Suppliers or

subcontract Suppliers). When the Supplier uses sub-tier sources to perform work on products and/or services scheduled for delivery to Crystal Group, the Supplier shall include (flow-down) on contracts, to its sub-tier sources, all of the applicable technical and quality requirements contained in the Crystal Group contract and this Quality Requirements Manual, including quality system requirements, regulatory requirements, the use of Crystal Group designated sources, and the requirement to document and control 'key characteristics' and/or 'key processes,' and to furnish certifications and test reports as required. Crystal Group and its customers reserve the right- of-entry to sub-tier facilities, subject to proprietary considerations.

- **Special Process Suppliers**

***For Crystal Group aerospace suppliers, unless otherwise specified by contract, the Supplier shall only use special process sources that are approved by Crystal Group and listed on the Crystal Group Approved Suppliers List (ASL). This requirement applies to Suppliers who perform special processing such as heat treating, plating, etc., as part of their internal operations. The Supplier shall flow-down this requirement to its sub-tier sources.***

- **Risk Management**

***For Crystal Group aerospace suppliers, it is highly encouraged for the Supplier to establish a risk management program to effectively assess those elements from all aspects of the business that could affect the quality of the products and/or services scheduled for delivery to Crystal Group. A risk management program is considered a best practice and is highly regarded within the industry. If the Supplier has a risk management program or develops one after becoming an approved Supplier for Crystal Group, a copy of the Supplier's risk management program shall be furnished to the Crystal Group Supplier Quality Team upon request.***

## Control and Release of Crystal Group Furnished Documents

Documents furnished by Crystal Group to the Supplier are furnished solely for the purpose of doing business with Crystal Group. Proprietary documents may be furnished to the Supplier in hard copy, electronic or other media. The Supplier is responsible for controlling and maintaining such documents to preclude improper use, loss, damage, alteration and/or deterioration.

Unless authorized by the Crystal Group Supplier Quality Team in writing, the Supplier may not transmit or furnish any Crystal Group furnished documents, or copies of such documents, to anyone outside the Supplier's business organization except to a sub-tier source used by the Supplier for performance of work on the Crystal Group contract. The Supplier shall return to

Crystal Group, or purge electronic copies of, all proprietary document with the last delivery of products or services on the contract. Crystal Group may request the Supplier to furnish objective evidence or certification that proprietary documents have been purged. The Supplier shall flow down this requirement to all sub-tier sources, when such sources will be in receipt of Crystal Group proprietary documents during performance of work for the Supplier.

## Electronic Documents

The accuracy and authenticity of electronic documents and forms submitted to Crystal Group is of highest importance. The following rules apply and may be subject to review by Crystal Group at Suppliers facilities:

- The issue of electronic documents and application of electronic signatures must be under the direct control of the individual whose name appears on the electronic document.
- The electronic signatures may only be applied at the place where the individual is located, and the individual must have direct access and responsibility for the products or services described in the electronic document.
- The application of the electronic signature certifies that the signature (individual) represents an authorized company official.

***For Crystal Group Aerospace, the use of electronic forms and signatures must be described in and governed by Supplier's documented procedures.***

## Business Continuity

The Supplier should have a business continuity plan which would allow for the safeguarding, storage and recovery of engineering drawings, electronic media, and production tooling in the event of damage or loss. This plan should also contain contingency plans to satisfy Crystal Group requirements in the event of significant utility interruptions, labor shortages, equipment failure and field returns.

Crystal Group requires notification on any changes that occur with the Supplier's business. These changes include ownership, management, location of facilities, or anything that affects the Supplier's quality management system. Supplier must also maintain quality system approval that meet Crystal Group's system requirements.

## Product Qualification

This section defines the generic requirements for production part qualification and approval. The purpose is to determine if all Crystal Group design and specification requirements are properly understood by the Supplier and that the manufacturing processes have the capability to consistently meet these requirements.

In all instances where a product is manufactured to a new design, for a new system, or for a new application, it is important that Supplier and Crystal Group allocate responsibility for assuring that all performance, endurance, maintenance, safety and warning requirements are met. It is preferred that this allocation of responsibility be in writing.

### First Article Inspection

As a minimum, a First Article Inspection (FAI) is required to initially qualify a part/process for Supplier approval, unless the PPAP process (below) is used instead. Furthermore, a new FAI may be requested if there is an extended gap of time since last production. The FAI requires that all features and characteristics on the design specification be inspected and verified prior to production. Actual measured values shall be recorded as opposed to general statements of conformance or other notations simply indicating acceptance.

For First Article Inspection guidance when a PPAP is required, see AIAG PPAP Manual (Appendix C, D, & E) – Production Part Approval Process (available from [www.aiag.org](http://www.aiag.org)). When submitting a First Article Inspection report, the Supplier should use the form provided by the Crystal Group Supplier Quality Team. Otherwise, generic, or other convenient and equivalent forms may be used.

In addition to a FAI, Suppliers are encouraged, as a minimum, to develop a Control Plan by identifying special product and process characteristics that are key to achieving quality. The Supplier shall also include those special characteristics designated by Crystal Group in the drawing, specification, or contract.

***For Crystal Group Aerospace, a new FAI is required if there is a twenty-four (24) month gap of time since last production and excess stock from last production cannot be used to satisfy the FAI requirement. A delta FAI is required when new revision of the part number is released. Unless otherwise required by contract, all FAI's shall be documented in accordance with AS9102.***

### Production Part Approval Process

When required by the Crystal Group contract, the Supplier shall submit to Crystal Group a more comprehensive Production Part Approval Process (PPAP) qualification package. The Supplier is responsible for obtaining the latest revision of the applicable AIAG core tool reference manuals and forms (see Applicable Documents section for where these references may be obtained).



The AIAG Core Tools Manuals are:

- Advanced Product Quality Planning (APQP) and Control Plan
- Production Part Approval Process (PPAP)
- Potential Failure Mode and Effects Analysis (FMEA)
- Measurement Systems Analysis (MSA)
- Statistical Process Control (SPC)

When PPAP is specified on the Crystal Group contract, the Supplier shall submit a “Level 3” PPAP package to the Crystal Group Supplier Quality Team which consists of the following items, unless otherwise directed. See AIAG PPAP Manual, Table 4.2, for complete list of submission requirements for each level of PPAP. Also, see AIAG APQP Manual for related guidance on associated product and process design and development methodology and techniques.

### Design Record, Change Documents, and Customer Approval

The Supplier shall have the design record for the saleable product/part and components; any authorized engineering change documents for those changes not yet recorded in the design record but incorporated in the product, part or tooling; and evidence of Crystal Group engineering approval. See AIAG PPAP Manual.

### Process Flow Diagram

The Supplier shall have a visual diagram of the proposed or current process. This diagram shall clearly describe the production process steps and sequence, and meet the specified Crystal Group needs, requirements and expectations. See AIAG PPAP Manual.

### Failure Mode and Effects Analysis

Suppliers with product design responsibility shall develop a Design FMEA in accordance with, and compliant to, Crystal Group-specified requirements. A single Design FMEA may be applied to a family of similar parts or materials.

Suppliers shall develop a Process FMEA in accordance with, and compliant to, Crystal Group-specified requirements. A single Process FMEA may be applied to a process manufacturing a family of similar parts or materials if reviewed for commonality by the Supplier. See AIAG FMEA Manual.

## Measurement Systems Analysis

The Supplier must develop or obtain gages and standards to control their processes and to determine product conformance to specifications. Variable gages and measurements are preferred. Alternative methods, gages or standards may be used at Crystal Group to verify the Supplier's inspection results.

Crystal Group may request the Supplier to participate in a correlation study to compare Supplier measurement results against results obtained by Crystal Group gages and methods.

The Supplier shall perform Measurement Systems Analysis (MSA) studies, e.g., gage repeatability & reproducibility, bias, linearity, stability, for all new or modified gages, measurement, and test equipment. See AIAG MSA Manual.

## Control Plan

The Supplier shall have a Control Plan that takes into account the output from the FMEA and defines all methods used for process monitoring and control of special product/process characteristics. The control plan covers three distinct phases: prototype, pre-launch, and production. A single control plan may apply to a group or family of products that are produced by the same process at the same source. See AIAG APQP Manual.

## Process Capability Study

Process Capability Index (Cpk) is a comparison of the inherent variability of a process output to specification limits under statistically stable conditions. Most methods for estimating capability require that the characteristic being evaluated is approximately normally distributed, and in statistical control. The distribution should be determined prior to estimating capability. If the process is not in statistical control, all assignable causes must first be identified and removed. Special techniques are available for calculating capability when inherent assignable causes, such as tool wear, are present.

Definitions and calculations for Cpk and Ppk indices are found in AIAG PPAP and SPC Manuals. Unless otherwise approved by Crystal Group, the Supplier shall use the following as acceptance criteria for evaluating initial process study results of special characteristics for processes that appear stable:

<u>Results</u>	<u>Interpretation</u>
Index > 1.67	The process currently meets acceptance criteria.
$1.33 \leq \text{Index} \leq 1.67$	The process is marginally acceptable.
Index < 1.33	The process is not acceptable.

## Certification and Test Reports

The Supplier shall provide evidence that the following verifications required by the design record and control plan have been completed and that results indicate compliance with specified requirements:

- Dimensional Results – for each unique manufacturing process, e.g., cells, lines, molds, patterns, a record of actual results of all characteristics.
- Material and Performance Test Results – for all parts and product materials with chemical, physical, metallurgical, and functional performance requirements.
- Qualified Laboratory Documentation – documentation showing laboratory results of the qualifications for the type of measurements or tests conducted and the standards used.
- Sample Product – actual samples as required by the applicable specification or Crystal Group contract.
- Master Sample – retain a master sample, when required by the Buyer, and make available upon request.
- Checking Aids – if requested by the Buyer, submit part-specific assembly or component checking aids.
- Records of Compliance – copies of records showing compliance to all applicable Crystal Group-specific requirements.

See AIAG PPAP Manual for applicable forms and instructions.

## Part Submission Warrant

Upon completion of all PPAP requirements, the Supplier shall complete the Part Submission Warrant (PSW). A separate PSW shall be completed for each Crystal Group part number unless otherwise specified by the Crystal Group contract. Upon receipt, Crystal Group will review and either approve, reject, or provide interim approval. See AIAG PPAP Manual for forms and instructions.

## Process Control

This section defines the basic necessities for Suppliers to control their manufacturing processes.

## Special Characteristics

The Supplier shall demonstrate conformity to those special characteristics designated by Crystal Group through means of documentation and appropriate control methods. In addition to any special characteristics identified by Crystal Group, the Supplier shall also review, identify,

document, and control other product and process characteristics that are key to achieving quality.

## Error Proofing

The Supplier should use error-proofing devices and techniques as a form of process control; especially for repetitive functions, difficult tasks prone to mistakes, or where the cost of error is high.

## Work Instructions

The Supplier shall prepare documented work instructions, as necessary, for all employees having responsibilities for the operation of processes that impact product quality. These instructions shall be maintained current and accessible for use at the work station.

## Control of Monitoring and Measuring Devices

The Supplier shall determine the monitoring and measurement to be undertaken and the monitoring and measuring devices needed to provide evidence of conformity of product to determined requirements. As a minimum, where necessary to ensure valid results, measuring equipment shall:

- Be calibrated or verified at specified intervals, or prior to use, against measurement standards traceable to international or national measurement standards; where no such standards exist, the basis used for calibration or verification shall be recorded; and
- be identified to enable the calibration status to be determined.

***For Crystal Group Aerospace, unless otherwise specified by contract, the Supplier shall establish procedures to control Measuring and Test Equipment (M&TE) that are in compliance with the requirements of ANSI/NCSL Z540-1 or ISO 10012.***

## Statistical Process Control

Where specified in the Control Plan, the Supplier is required to apply effective statistical process controls. Suppliers should consult the Statistical Process Control (SPC) manual published by AIAG for guidance, methods, examples, and related reference information.

## Preventive Maintenance

The Supplier should identify key process equipment and provide resources for machine/equipment maintenance activities and develop an effective planned total preventive maintenance system.

## Source Inspection

Supplier's products or services may be subject to source inspection by Crystal Group, representatives of Crystal Group, Crystal Group customers or applicable government or regulatory agencies. Source inspection requirement will be included on the contract and may apply to any and all operations performed by the Supplier or the Supplier's sub-tier sources, including prior to delivery of products to Crystal Group. The Supplier shall provide the necessary access, equipment and resources required to effectively accomplish the source inspection.

## Shelf-Life Control

Materials - With each delivery of materials or products that have a limited or specified shelf life, the Supplier shall furnish data that shows (a) the cure or manufacture date, (b) expiration date or shelf life, (c) lot or batch number, and when applicable any special handling or storage requirements. Unless otherwise specified by contract, for all shelf life limited materials or products delivered to Crystal Group, the remaining shelf life shall be a minimum of 75% of the total shelf life for the material once applied to the part this will no longer apply.

***Elastomers and Seals - For Crystal Group Aerospace, Suppliers scheduled to provide elastomeric seals or assemblies must meet the requirements for data recording procedures, packaging, and storage of elastomeric seals and seal assemblies which includes an elastomeric element per ARP5316.***

## Foreign Object Debris/Damage (FOD) Prevention

***Whenever FOD entrapment or foreign objects can migrate, the Supplier shall maintain a FOD prevention program IN COMPLIANCE WITH AS9146. Prior to closing inaccessible or obscured areas and compartments during assembly, the Supplier shall inspect for foreign objects/materials and ensure no FOD exists. The Supplier shall ensure tooling, jigs, fixtures, and test or handling equipment, are maintained in a state of cleanliness and have certified that such items are free from any foreign materials that could result in FOD. The Supplier's quality program shall include FOD preventive practices and packaging.***

## Sampling Inspection

The Supplier is responsible for quality of all items delivered to Crystal Group.

***For Crystal Group Aerospace, when the Supplier elects to use statistical methods for the acceptance of products or processes, such methods shall be in compliance with the requirements established by SAE ARP9013, 9013/1, 9013/2, 9013/3 and 9013/4 as applicable, except that in all cases the sample sizes shall be AQL 4.0 or higher (i.e., AQL 1.0, .65, etc.) and the criteria for lot acceptance as zero (i.e., C=0). A copy of Suppliers statistical process control plan shall be furnished to Crystal Group upon request.***

## Operator Self-Verification

***Crystal Group Aerospace Suppliers may delegate inspection authority and product/process inspection and acceptance to production operators. In such cases, the Supplier's operator self-verification program shall comply with the requirements of SAE ARP9162. Prior to implementation of the program on products/processes scheduled for delivery to Crystal Group, the Supplier shall request and obtain approval from Crystal Group in writing.***

## Raw Material Lot Control

Supplier shall periodically validate test reports for raw material accepted on the basis of test reports. That validation shall be accomplished by Supplier or other independent party through periodic, schedule test of raw materials samples. Schedules for frequency of tests will be established by Supplier on historical performance of the raw material supplier. Supplier shall retain test reports provided by the raw materials supplier, as well as Supplier's validation test results as quality records traceable to the conformance of goods.

There shall be no substitutions of like or similar goods without written authorization by an authorized representative from Crystal Group. Unauthorized material substitution includes any deviation from the engineering definition of a raw material. Engineering definition includes Crystal Group's design drawing and applicable specifications, product specification, form, size, shape, chemistry, melt method, origin, temper/condition, product testing or surface finish. Alternate materials specified in the engineering definition (and often described as approved material substitutions therein) do not constitute unauthorized material substitution. Unless specifically authorized by the engineering definition, conversion of a raw material (i.e. heat treat to change the temper or condition of the material) constitutes material substitution of the condition provided by the manufacturer and shall not be done with authorization from Crystal

Group. Crystal Group's engineering drawings may refer to obsolete or superseded specifications covering several forms, thicknesses, widths, etc. of the alloy or alloys. The required characteristics of these materials are defined not only by the objective test standards of the specification, but by the processes/methods by which this final form is achieved. These requirements are often captured in the definitions of the required material forms and may not be explicitly called out in the detailed requirements. The raw material certification results from both the process used to make it and the tests to verify basic properties. Supplier shall ensure that metallic materials covered by current or obsolete/superseded specifications are produced using the standard industry practices designed strictly for the production of stock to the specified thickness, diameter, width or cross-sectional area, achieved by thermo-mechanical processing or casting process. Chemical, electrochemical and mechanical methods used for the removal of surface scale or contamination, or the production of the required surface finish, in accordance with the material specification are acceptable. Raw material must not be re-certified with respect to thickness, diameter, width or cross-sectional area or product form. Raw material certifications for material or parts shall reflect the form and size of the raw material as originally manufactured by the raw material producer. For government specifications and standards canceled after June 1994, Supplier and subcontractors at all tiers shall use the last active revision of the canceled specification and standard until an acceptable replacement is included in the requirements of a PO. Contact Crystal Group in the event of any inconsistency in applicable specification or standard. Supplier shall not disguise the pedigree of material or chain of ownership by removal of a previous supplier's name, nomenclature or identification.

***For Crystal Group Aerospace, in those cases where the Supplier elects to use more than one lot of raw material, the Supplier shall ensure, document and furnish positive traceability of each individual product to the raw material certification/test report that represents the raw material from which each of the products was manufactured. Traceability shall be provided by identifying the raw material heat, lot, batch or melt number from the certification/test report on the product and/or on packaging (when used), or the products segregated and identified.***

## Electro-Static Discharge (ESD) Control

***Suppliers scheduled to provide ESD sensitive devices to Crystal Group Aerospace shall, prior to processing product, establish, document and implement an Electrostatic Discharge (ESD) Control Program plan in compliance with the requirements of MIL-STD-1686 or equivalent.***

## Counterfeit Component Avoidance

***“Franchised distributor” means a distributor whom a manufacturer has authorized to distribute its product lines as defined in AS6081. Franchised distributors are expected to have contracts with the manufacturer to exclusively provide inventory to the original component manufacturer.***

***“Independent distributor” means a distributor that purchases excess inventories from end users with the intention to sell and redistribute onto the market that do not have limiting contractual agreements or obligations with the original component manufacturer as defined in AS6081.***

***Independent distributors are required to provide verification of authenticity in the form of a certificate of compliance that includes the original manufacturer’s name and batch identification for the item(s) such as date codes, lot codes, serializations, or other batch identifications for each item shipped and shall include the following:***

- ***General information (Shipping, Packaging, and Labeling Requirements).***
- ***Applied tests and the results.***
- ***Shall state a known chain of custody for the material originating from the original component manufacture or evidence of verification of part compliance utilizing methods defined in section IDEA-STD-1010.***
- ***Shall state the part meets the conditions of new as defined in AS6081 or has included an approved deviation to included parts meeting the conditions of unused as defined in AS6081.***

***Independent distributor shall maintain Technology Errors & Omissions liability insurance including, but not limited to loss or damage resulting from the supply of counterfeit components and products worldwide with no exclusions for any geographic areas with an aggregate limit of \$3 Million.***

***There shall be an effective system for the legal disposition of counterfeit components and control of nonconforming products.***

***Independent distributors shall perform component inspection per AS6081.***

## Conflict Minerals

Crystal Group, Inc. (“Crystal Group”) has adopted the following Conflict Minerals Policy Statement.

In 2012, the Securities and Exchange Commission (“SEC”) adopted final rules under Section 1502 of Dodd-Frank Wall Street Reform and Consumer Protection Act relating to “Conflict



Minerals.” Section 1502 of the Dodd-Frank Act was adopted because Conflict Minerals originating from the Democratic Republic of Congo (the “DRC”) and adjoining countries (the “Covered Countries”) may directly or indirectly be funding or benefitting illegal armed groups committing human rights atrocities in that region. These Conflict Minerals from the DRC and the Covered Countries – tantalum, tin, tungsten and gold – are making their way into the supply chain of companies in the United States of America.

Under these Conflict Minerals rules and regulations, publicly-traded companies must report annually to the SEC if they use any Conflict Minerals from the DRC and the Covered Countries in the products they manufacture or contract to manufacture if the Conflict Minerals are necessary to the functionality or production of a product.

While Crystal Group does not source any Conflict Minerals from the DRC and the Covered Countries directly, such Conflict Materials may exist in the products, materials and components that Crystal Group sources from its suppliers. Crystal Group is committed to working with its suppliers to responsibly source the materials and components Crystal Group uses in its products.

To facilitate compliance with these Conflict Minerals rules, Crystal Group conducts inquiries of its supply chain in an effort to determine the source of any Conflict Minerals from the DRC and the Covered Countries and to assist in the reporting of the results of its inquiries. In order for Crystal Group to accomplish this, Crystal Group requires its relevant suppliers to respond to information requests regarding the uses and sources of Conflict Minerals from the DRC and the Covered Countries in their products, including information about minerals that are recycled or scrapped.

In addition, Crystal Group expects the following of its suppliers:

To assist in compliance with the SEC rules and regulations relating to Conflict Minerals and to provide all necessary representations, declarations or certifications;

To undertake reasonable due diligence within their supply chain to determine the source and chain of custody of their Conflict Minerals, including developing policies and systems to avoid the use of Conflict Minerals from the DRC and the Covered Countries; and

To pass these requirements along to their suppliers through the supply chain and require them to do the same.

Crystal Group’s relationships with its suppliers are evaluated on an ongoing basis to ensure continued compliance with this Policy Statement. Crystal Group reserves the right to request additional documentation from its suppliers regarding the source of any Conflict Minerals included in its products, materials and components. Suppliers that do not comply with these requirements will be reviewed by Crystal Group’s buyers for future business.

## Change Control

The Supplier is responsible for controlling changes and notifying the Crystal Group Supplier Quality Team of all changes to the approved part design, manufacturing process, or site.

### Change Control Process

The Supplier shall have a process to ensure that relevant versions of applicable documents furnished by Crystal Group (as well as those specified of external origin) are available at points of use.

The Supplier is responsible for the timely review, distribution and implementation of all Crystal Group engineering standards/specifications and changes in accordance with the schedule required by Crystal Group. Timely review should be as soon as possible and shall not exceed two working weeks. The Supplier shall maintain a record of the date on which each change is implemented in production. Implementation shall include updated documents.

### Supplier Change Requests

Suppliers shall not make changes to their processes, location, facilities, equipment, material, product design (or any change which may affect product design or function) without written approval from the Crystal Group Supplier Quality Team for:

- Correction of a discrepancy on a previously submitted part;
- Product modified by an engineering change to design records, specifications, or materials; or
- Any planned changes by the Supplier to the design, process, or manufacturing location, such as:
  - Use of other material than was used in previously approved part or product
  - Production from new, additional, replacement or modified tools, dies, molds, patterns, etc.
  - Production following upgrade or rearrangement of existing tooling or equipment
  - Production from tooling and equipment transferred to a different plant site or from an additional plant
  - Change of sub-tier Supplier for parts, nonequivalent materials, or services (e.g. heat treating, plating, etc.)
  - Product produced after tooling has been inactive for production for 12 months or more
  - Change to test/inspection method – new technique (no effect on acceptance criteria)

- For bulk materials: new source of raw material from new or existing Supplier, or change in product appearance attributes, etc.
- Use of any non-conventional manufacturing methods such as electro-discharge machining (EDM), electro-chemical machining (ECM), laser or abrasive water jet metal cutting, flame spray coatings, etc.

Before submitting to Crystal Group, a request for a permanent change to a Supplier-controlled design, the Supplier shall review the FMEA and Control Plan, as applicable, to ensure that all process-related issues have been addressed and resolved. Crystal Group may require the Supplier to submit an updated FMEA and Control Plan prior to approval of such permanent changes. Crystal Group may also require other portions, or all, of the related qualification process to be repeated. In some cases, Crystal Group may elect to review Supplier proposed permanent changes at the Supplier's facility.

***For Crystal Group Aerospace Suppliers, unless the Supplier is specifically granted material review and disposition authority by the contract, the Supplier shall document all nonconforming conditions in accordance with the requirements of AS9131 and submit them to Crystal Group Material Review Board (MRB) for disposition.***

## Control of Nonconforming Material

For nonconforming products supplied to Crystal Group, including those that reach a Crystal Group customer, the Supplier must cover all costs to correct the nonconformance.

## Supplier Request for Nonconformance Deviation

A Supplier shall not knowingly ship product that deviates from the drawing, specification limits, or design intent without prior written authorization from the Crystal Group Supplier Quality Team. If such a condition exists, the Supplier may petition the Crystal Group Supplier Quality Team, in writing, to allow shipment of the product under a written nonconformance deviation. The Supplier shall use Crystal Group's Supplier Deviation Request, or equivalent, unless otherwise directed.

If requested by the Crystal Group Supplier Quality Team, the Supplier must send samples of such nonconforming items to Crystal Group for evaluation. The cost of shipping, inspection, and testing to determine the potential acceptability of such product will be charged to the Supplier.

Crystal Group approval of a deviation is specific to the products for which it has been submitted and approved and shall not to be construed as a permanent engineering change. The Supplier must begin work immediately on corrective action. In all cases, the Supplier shall fully contain all

product suspected of being nonconforming. In addition, nonconforming product may be returned to the Supplier at Supplier expense, or the Supplier may be required to sort any suspect product already shipped to Crystal Group sites or be charged back for the cost of sorting by Crystal Group. Any parts shipped to Crystal Group that have been approved for deviation shall be clearly identified as such, externally on the box, container, or other packaging and on shipping documentation. Inside of each box shall contain a copy of the Crystal Group-approved deviation document.

***For Crystal Group Aerospace Suppliers, the Supplier shall document all nonconforming conditions in accordance with the requirements of AS9131 and submit them to the Crystal Group Supplier Quality Team for review. This includes:***

***When a nonconformance is determined to exist or is suspected to exist on goods and/or services provided to Crystal Group, Supplier shall provide written Post Delivery Notification Letter or Letter of Disclosure (Notification of Escapement [NOE]) to Crystal Group's Authorized Procurement Representative. Supplier shall provide the letter and all required NOE information within two (2) business days of when nonconformance was determined. However, if the nonconformance affects safety of flight or is mission critical; Supplier shall immediately provide the letter and all available information. The Buyer will provide information to Supplier if a specific Purchase Order is for product known to affect safety of flight or is mission critical.***

***When Crystal Group's Authorized Procurement Representative or Supplier Quality Team gets a supplier Notice of Escape (NOE) they will:***

- 1. Save a copy to H:\Quality\Supplier NOE and notify the Quality Manager.***
- 2. Determine if a SCAR is necessary. If so, one will be issued.***
- 3. Determine if NOE should be issued to the customer.***

***At minimum, Supplier shall include the following NOE information:***

- 1. Date(s) goods and/or services were shipped under this purchase order***
- 2. Crystal Group's purchase order number and line item number***
- 3. Part number(s) and when applicable, the associated serial number(s) and/or lot number(s)***
- 4. Quantity***
- 5. Date of manufacture and any other pertinent information***
- 6. Specific description of nonconformance (i.e., "should be" and "is" condition) with reference to applicable engineering documentation***
- 7. Statement declaring whether the nonconformance was determined to exist or suspected to exist***
- 8. Preliminary root cause and root cause corrective action***
- 9. Name of Supplier's Quality personnel involved in the collection and reporting of the NOE information is required to notify the organization of nonconforming product. Disposition will be determined between Crystal Group and Supplier.***

## Control of Reworked Product

*Rework* is defined as additional operations that are not part of the basic production process flow, which will bring product in full compliance with applicable drawings and specifications. Instructions for rework, including re-inspection requirements, shall be accessible to and utilized by the Suppliers appropriate personnel. All rework shall be documented and accepted by quality. On the other hand, *repair* is defined as using alternative manufacturing techniques, methods, materials, or processes which *may not* bring product into full compliance with applicable drawings and specifications. Repairs are not allowed without written approval from Crystal Group.

## Supplier Containment

For product quality problems reported by Crystal Group to the Supplier, until formal corrective action has been taken and approved, the Supplier shall provide documented evidence with subsequent shipments that such product has been inspected for the identified nonconformances and meets all applicable requirements.

## Unconfirmed Failure Rejections

In the event goods delivered on a purchase contract are returned by Crystal Group to the Supplier and the Supplier is unable to confirm the reported failure, the Supplier shall hold shipment and provide the following to Crystal Group for disposition:

1. Purchase contract number, part number, serial number
2. Crystal Groups reject form number
3. Applicable test procedures, results of special tests performed by Supplier, and Supplier's certification that test procedure used to verify the failure identified by Crystal Group was adequate to detect those failures; Supplier to provide number and revision of test procedure(s) used.

## Packaging, Labeling, Delivery & Record Retention

Preservation, packaging, labeling, and shipping methods must comply with common industry practices and Crystal Group requirements specified on the contract.

### Preservation

In order to detect deterioration, the condition of product in stock should be assessed at appropriate planned intervals. The Supplier should use an inventory management system to

optimize inventory turns over time and should assure stock rotation, such as “first-in-first-out” (FIFO).

## Packaging

The Supplier must adequately plan for packaging designed to prevent product contamination, deterioration or loss and to eliminate shipping damage. Suppliers should provide expendable packaging or returnable containers, where appropriate, that provide for sufficient density and protection from any likely damage that may occur. Expendable materials and packaging must meet local and national standards for safe disposal and/or recycling.

## Labeling

Labeling and bar code requirements may vary depending on Supplier type. The Crystal Group Supplier Quality Team will provide the Supplier with the necessary specifications.

## Delivery

The Supplier should systematically inform Crystal Group of any delay in delivering product and provide a new dispatch date. The Supplier is responsible for additional transport costs due to delays. All deliveries should be FOB Destination.

### Certificates of Conformance (CofC)

All items purchased from a Supplier require a certificate of conformance (CofC). This includes COTS (commercial-off-the-shelf) parts and parts that manufactured to a Crystal Group print. If Supplier is not a manufacturer (or service provider), in addition to the Suppliers CofC, the following shall be included:

- A manufacturer's (or service provider's) CofC
- A certificate of conformance and supply chain traceability (CoCT) – A certificate of conformance that provides evidence that the parts were obtained directly from the Original Component Manufacturer (OCM) or approved manufacturer

The following shall be included on Suppliers CofC and/or shipping document with each shipment:

1. Supplier Name, address and reference to Buyers contract number (PO#) and line item number

2. Manufacturer's (or service provider's) name and address along with their CofC
3. Part number and dash number
4. Drawing/specification revision level/version
5. Traceability information, if required, representative of each item – to include the lot trace or the individual item trace
6. When multiple item manufacturers (or service providers) and/or multiple lots are included in one shipment, Supplier shall separate and identify respective manufacturer's (or service provider's) logs, and indicate each lot quantity
7. If goods are Buyer furnished, so indicate on CofC by part number and quantity
8. Additional documentation requirements defined by the item specification as applicable
9. Line/release number (when applicable)
10. Quantity delivered
11. Packing list/shipper number (when applicable)

When applicable, the following shall be included on Suppliers CofC with each shipment:

1. Name, address and phone number of the OCM authorized distributor
2. Statement that the supplier is an OCM authorized source
3. Part number
4. Part manufacturer ("OCM")
5. Lot code/Date code as applicable
6. Quantity
7. Supplier Quality Assurance ("QA") manager signature or stamp with title of Supplier's authorized personnel signing the certificate, date of signing, and statement attesting that goods provided under this contract conform to all contract requirements. Certificates utilizing secured computer-generated signatures with title of Supplier's authorized personnel are acceptable.
8. C of C Date

When additional certifications/test reports are required for special processing, raw material, etc. the requirements will be specified on the contract.

## Record Retention

Supplier shall maintain on file all quality data/records such as; certificates of material and/or processes, acceptance test reports, inspection records, and other applicable quality control data for a minimum of 15 years from completion of purchase order. Prior to the destruction of any records related to this order, copies of any record not older than 90 years shall be provided to Crystal Group for storage at our facilities.

Upon request, the Supplier shall be capable of retrieving and delivering required records to Crystal Group within forty-eight hours from time of request by Crystal Group.

**Unless otherwise specified by Crystal Group, Aerospace Suppliers shall maintain all records that provide objective evidence of compliance to Crystal Group contract requirements for a minimum of fifteen (15) years after the last delivery of products and/or services on the contract. Prior to discarding, transferring to another organization, or destruction of such records, the Supplier shall notify the Crystal Group Supplier Quality Team in writing and give Crystal Group the opportunity to gain possession of the records. These requirements are applicable to records generated by Supplier’s sub-tier sources.**

## Continual Improvement

Suppliers should define a process for continual improvement. Recommend ISO 9004, including Annex B. A copy of the Supplier’s continual improvement program shall be furnished to Crystal Group upon request.

## Problem Solving Process

Suppliers should use a closed-loop corrective action process whenever a problem is encountered internally or upon notification from Crystal Group. For example:

1	Describe the problem	State what the problem “is” and “is not” with respect to what, where, when, who, how, and how many. Use quantitative terms.
2	Use a team approach	Consult and coordinate with relevant stakeholders.
3	Apply Containment	Immediately contain any suspect product to protect Crystal Group and its customers.
4	Root cause analysis	Identify potential causes, analyze causes for failure mode, validate root cause(s) and identify solutions.
5	Implement	Implement solution. Update



	permanent corrective action	applicable FMEA, control plan and work instructions.
6	Verify effectiveness of corrective action	Use check sheets, auditing, sampling, and/or control plans to monitor process performance for effectiveness and sustained improvement.
7	Implement preventive action	Implement changes to prevent the same type of error from occurring in similar products/processes. Update applicable documents.
8	Management Support	Review, approve, and support. Provide resources and team recognition.

For additional guidance on problem solving methods, tools, training, and related references, refer to AIAG document CQI-10.

## Corrective Action Report

Crystal Group may issue a request for a Supplier Corrective Action Report (SCAR) to the Supplier when nonconforming material, components, or assemblies are found. When a formal reply is requested (whether hard copy or electronic media), the Supplier should use Supplier Corrective Action Report designated by Crystal Group, FRM-00005, or other convenient media of equivalent content.

When documenting the root cause, the Supplier shall include the underlying reasons:

- Why the specific nonconforming condition or incident occurred,
- Why it was not detected by the Suppliers quality controls, and
- Why the related process, from a systemic viewpoint, allowed the nonconformance (and potentially others like it) to occur.

The Supplier should apply the following criteria to determine whether the underlying root cause has been identified:

1. It initiates and causes the event you are seeking to explain.
2. It is directly controllable.

3. The elimination of that root cause will result in the elimination or reduction of the problem.

Statements from the Supplier indicating that the corrective action is to alert or retrain the operator, and/or increase inspection, alone, are acceptable corrective actions per AS9100 Rev D. These kinds of actions would be considered insufficient and not address the real underlying root cause(s) of why the Supplier's policy, instructions, process, procedure, and/or system allowed the problem to develop and occur and not be detected by quality controls.

Unless otherwise requested by Crystal Group when notified, the Supplier shall respond to a request for corrective action as follows:

<b>Required Action</b>	<b>Timeline (from initial notification by Crystal Group)</b>
The Supplier shall promptly acknowledge receipt of notification and communicate to Crystal Group the immediate containment actions to be taken.	<i>Within 24 hours</i>
<p>The Supplier shall provide an update of the containment plan to protect Crystal Group during the interim period. This update must include:</p> <ul style="list-style-type: none"> <li>• Confirmation that the Supplier has identified all suspect product in process, in stock, in transit, and potentially at any Crystal Group site by lot number, Crystal Group contract number, and quantity.</li> <li>• Additional specific containment actions needed to be taken by the Supplier and/or Crystal Group.</li> </ul>	<i>Within 72 hours</i>
The Supplier must submit the completed Corrective Action Report indicating the permanent actions taken, or to be taken, to prevent recurrence of the same problem, to prevent the occurrence of similar problems, and the applicable effectivity dates.	<i>Within 10 business days</i>

## Delegation of Product Release Verification Program (DPRV)

Crystal Group expects to receive products from Suppliers with zero defects allowing products to move directly from dock to stock, or to the point of use, without incurring additional costs associated with receiving inspection. Crystal Group may charge Suppliers for costs to sort, evaluate, and return products that do not meet requirements. Where allowed, Crystal Group will administer a DPRV program on the basis of individual part numbers, product families, or overall Supplier performance.

Where implemented, DPRV applies to material and components released for production that ship to Crystal Group. However, Crystal Group reserves the right to inspect any product upon receipt or at any other time, due to criticality or any other factor, or cancel the program at any time.

DPRV typically does not include pre-released parts, samples, prototypes, pilot fabrication runs, first articles for new tooling or processes, and other low-volume applications.

### DPRV Approval Requirements

To be considered for DPRV, the Supplier must meet the following requirements:

1. Must be an approved Crystal Group Supplier that is not in a conditional status
2. The approved Supplier has no outstanding corrective actions
3. The Supplier's performance is being monitored and has shown acceptable level of performance
4. A risk evaluation, using Crystal Group Form, FRM-00140, has been completed for the Supplier and any required actions have been taken
5. A member of Crystal Group Supplier Quality Team and/or Purchasing will visit supplier and perform an on-site initial product verification audit (PVA) which must be completed successfully, and any required action taken

### DPRV Maintenance

In addition to the initial PVA, suppliers with delegated authority for inspection will be subject to periodic Product Verification Audits to monitor on-going compliance with requirements. Finished product will be selected for audit, dimensions will be verified, and all records pertaining to fabrication will be examined.

1. The minimum frequency for the PVA is every two years. These audits may be performed more frequently at the discretion of Crystal Group Supplier Quality.

2. Any required corrections for deficiencies detected during the periodic PVA will be documented and implemented through the Crystal Group CPA system. All required actions must be resolved for the delegation program to be sustained.

Suppliers exhibiting deteriorating performance may be required to submit a formal corrective action plan. Failure to submit and implement an effective plan may result in removal of DPRV authority status, being placed on probation, or disapproval.

## Supplier DPRV Program Requirements

The DPRV shall be performed on each release of product. DPRV shall be performed after final inspection, as close to shipment as practical; conducted as an independent process by someone other than the person who performed the final inspection, unless waived by Crystal Group.

The DPRV shall consist of, but not limited to:

- Contract/purchase order review.
- Supplier documentation review.
  - Verification that all required operations and inspections are complete.
  - When applicable, verification that nonconforming product has been properly documented and processed, in accordance with Crystal Groups requirements listed within this document.
  - Verification that Crystal Group's requirements for FAI (AS9102) have been satisfied.
- Physical product verification, including verification of product marking/identification and visual examination. When required by Crystal Group, DPRV shall validate special requirements, critical items, and key characteristics.
- Shipping/release documentation.

DPRV personnel shall validate and record the completion of the verification activity, such as through use of a checklist.

When required by Crystal Group, specific stamps, signatures, identification number, etc., shall be used for product release.

Sampling plans for product verification may be used with approval from Crystal Group.

Product and/or documentation nonconformances detected, during the DPRV process, shall be processed in accordance with the supplier's nonconformance and corrective action procedures.

All packaging containers shall be stamped in red ink with the Delegation Stamp provided by Crystal Group.

When Crystal Group determines a supplier qualifies for DPRV, the supplier will need to follow the requirements as followed:

1. Suppliers with delegated product release verification authority are responsible for maintaining a Quality assurance system that will assure submitted products conform to all purchase order requirements.

Suppliers in the Program shall:

- Maintain their QMS approval.
- Maintain a documented process detailing the requirements for the DPRV, including the establishment of process controls and monitoring for process effectiveness.
- Keep a list of authorized DPRV personnel, including the associated scope of approval.
- Assure that the authorized DPRV personnel have prerequisites, including but not limited to those listed below, sufficient to be able to perform their duties.
  - Access to product-related documentation.
  - Access to necessary facilities and equipment to be able to perform DPRV activities.
  - Sufficient time allotted to adequately perform the associated product verification activities.
  - The authority to suspend the release of products, until all open issues associated with the product being released are addressed.
  - Documented and demonstrable proficiency and training, including appropriate product knowledge.
- Maintain copies of all documents associated with shipments on file for a period of fifteen years from the last contract delivery. CG must be notified prior to disposal of any documentation associated with deliveries of product to CG.
  - Upon request, make documentation available to CG personnel within 48 hours.
- Submit all known nonconforming conditions to CG Supplier Quality for review, disposition, and authorization to ship.
- Respond to requests for corrective or preventive action in a timely manner.

- Notify CG of any facility or program changes that could affect the conformity of product delivered under the Delegated Product Release Verification Program.
- Obtain documented approval from CG, if they intend to use a sub-tier supplier to verify and release the final product, in accordance with CG's process requirements.
- Qualify DPRV personnel.
  - Selection of DPRV personnel shall be based on their background, experience, and product knowledge. Specific training and/or testing shall be established by the supplier. The supplier shall ensure training and qualification is appropriate for the product being released. AS13001 certified training meets all criteria.
  - DPRV personnel shall have a periodic vision assessment to a recognized standard, unless waived by CG.
  - DPRV personnel shall be subject to periodic requalification and training by the supplier, at a minimum every three years.
  - The supplier shall meet additional requirements for DPRV personnel contractually imposed by CG.
- Monitor DPRV personnel performance and have defined criteria to disqualify/suspend the DPRV personnel, including notification to CG.
- Retain the following records:
  - Records that DPRV activity has been performed (e.g., DPRV Checklist).
  - Initial and recurrent qualification records for DPRV personnel.
  - List of approved DPRV personnel.
  - Vision assessment record for DPRV Personnel, unless waived by CG.
  - Records of product and/or documentation nonconformances identified during the DPRV process.
  - Approval for sub-tier delegation from CG.
- Maintain condition of Delegation stamp provided by CG.

Purchase and use red ink for Delegation stamp on exterior of packaging container.

## Supplier Performance

Crystal Group's evaluation system uses a number of factors, such as Quality, Delivery, and Severity and frequency of nonconforming material to develop an overall Supplier performance rating. This rating serves as an objective measure to determine whether Crystal Group expectations are being met. Crystal Group's delivery mechanism for the Supplier performance rating is a Supplier Scorecard delivered bi-annually.

Supplier scorecards is the primary performance rating system used by Crystal Group.

At Crystal Group's discretion, the Crystal Group Supplier Quality Team may determine that to address the Suppliers performance deficiencies, a meeting with Supplier's management is necessary and a Supplier documented corrective action and improvement plan is required.

## Performance Measures

### Quality

This metric defines the Defective Parts Per Million (DPPM) shipped using the following formula. The definition of "defective parts" is the total number of parts returned to the Supplier for any valid quality reason (including those caused by shipping and administrative errors):

$$\text{DPPM} = \frac{\text{Number of Parts Rejected}}{\text{Number of Parts Received}} \times 1,000,000$$

Based on Crystal Group's current expectations, the following table describes the resulting actions for varying DPPM performance levels:

Premiere	Meets requirement set by Crystal Group
Preferred	Satisfactory; no action required
Marginal	Systemic corrective action may be required
Unacceptable	Systemic corrective action is required and may require Supplier to meet with Crystal Group management representatives.

A Supplier Corrective Action Request (SCAR) will be issued to any Supplier who has:

- DPPM that is equal to or greater than 10,000 for 2 consecutive months
- Any nonconformance with a lot size of 50 pieces or larger

## Delivery

This metric defines the delivery performance rating using the following formula: “On time” is based on the agreed upon PO date.

$$\text{Delivery} = \frac{\text{Number of Parts Received On Time}}{\text{Number of Parts Received}} \times 100$$

Based on Crystal Group’s current expectations, the following table describes the resulting actions for varying delivery performance levels:

Premiere	Meets requirement set by Crystal Group
Preferred	Satisfactory; no action required
Marginal	Systemic corrective action may be required
Unacceptable	Systemic corrective action is required and may require Supplier to meet with Crystal Group management representatives.

A Supplier Corrective Action Request (SCAR) will be issued to any Supplier who has:

- Less than 90% OTD for 2 consecutive months

## Forms and Exhibits

Many of the required forms are available in the respective AIAG core tools manuals and other reference documents. Certain unique Crystal Group forms are exhibited herein\*. Electronic versions of these and other Crystal Group forms (including those considered equivalent to the AIAG forms) may be obtained from your Crystal Group Supplier Quality Team.

Form Number	Form Title	Available From
CFG-1001	Part Submission Warrant	See PPAP Manual
THE-1001	Part Submission Warrant	See PPAP Manual
CFG-1003	PPAP-Dimensional Results	See PPAP Manual
CFG-1004	PPAP-Material Test Results	See PPAP Manual
CFG-1005	PPAP-Performance Test Results	See PPAP Manual
FRM-00005	Supplier Corrective Action Report	Crystal Group Supplier Quality Team
AS9102	First Article Inspection Report	Crystal Group Supplier Quality Team



DOC-00008	Crystal Group Nonconforming Material Waiver Request	Crystal Group Supplier Quality Team
FRM-00157 FRM-00158	Supplier Quality Assessment	Crystal Group Supplier Quality Team

### Acknowledgement & Agreement

This is to acknowledge that the Supplier has received a copy of this Supplier Quality Requirements Manual (SQRM) from Crystal Group.

The Supplier understands that the SQRM sets forth the terms and conditions of supplying product to Crystal Group. The Supplier agrees to abide by the rules, policies, and standards the SQRM sets forth. The Supplier also understands, with the exception through a written contract, this SQRM supersedes all prior agreements, understandings, and representations concerning the Supplier relationship with Crystal Group.

\_\_\_\_\_  
Supplier Designee Name

\_\_\_\_\_  
Crystal Group Name

\_\_\_\_\_  
Supplier Designee Title

\_\_\_\_\_  
Crystal Group Title

\_\_\_\_\_  
Supplier Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Crystal Group Signature

\_\_\_\_\_  
Date