

 Hanwha	SUPPLIER QUALITY ASSURANCE REQUIREMENTS	Doc. Group	SQAR
		Doc. No.	Q1000

Rev. No.	Date	Description	Prepare	Review	Approval
0	2014.10.27	Initial Issue	NI Kim	SW Kim	YH Cho
1	2015.02.05	Add Para 4.13. Define the control of the supplier's traveller, planning, Tool/Fixture and CNC/CMM program	KH Jung	SW Kim	YH Cho
2	2015.07.13.	Add Para 4.3.3 - Additional Q code requirement of SQAR Amend Para 4.6 - Regulatory's authorities Amend Para 4.8 - Control of subcontracting Amend Para 4.11 - Technical data control process of supplier Amend Para 4.12 - Tool & Fixture control number and grade Add Para 4.14 - Requirement of record control in English Amend Para 5.4.2 - Requirement of non-conforming products Add Para 5.4.5 - NOE requirements Add Para 5.5.3 - First Article Inspection Report(FAIR) requirements Amend Para 5.6.1 - Requirement of production document approval Add Para 5.7.5 - Exception process of source inspections Amend Para 5.8.2 - Request for postponement of RCCA submission Add Para 5.8.3 - Control of overdue submission of RCCA Add Reference of Para 5.10.1 - Approval of other special processes Amend Para 5.12.1 - Retention period change : 10 years → 15 years Add Note 4 of Para 5.13.2 - FAIR requirement of sub assy and detail parts Amend & Delete Para 6.1.1, 6.1.2 - Consolidated and move to Para 6.1 Delete Para 7 attachment 3 - [Attachment3] AS9102 FAIR Form 1, 2, 3	KH Jung	SW Kim	YH Cho

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3	2017.09.01.	<p>Amend Para 4.1 - Requirement of QMS establishment</p> <p>Amend Para 4.2 - Requirement of Quality Plan submission</p> <p>Amend Para 4.4 - Link to Para 5.13 Delivery requirement</p> <p>Amend Para 5.1 and subclause - Requirement of international QMS certification 1) 5.1.1 System establishment requirement 2) 5.1.2 AS9100 certification requirement 3) 5.1.3 Non-certified supplier requirement</p> <p>Amend Para 5.2.3 - Elimination of repeated requirement with 5.2.2</p> <p>Amend Para 5.5.2 - Requirement of First Article requirement</p> <p>Add Para 5.5.4 - Requirement of record and submission of FAIR</p> <p>Amend Para 5.6.1 - Requirement of production process approval</p> <p>Amend Para 5.6.2 - Requirement of record of inspection results</p> <p>Amend Para 5.7 and subclause - Requirement of DQR and source inspection 1) 5.7.2 DQR qualification advantage 2) 5.7.3 Requirement of unqualified DQR 3) 5.7.4 Elimination of repeated requirement 4) 5.7.5 Deleted</p> <p>Amend Para 5.12 - Simplification of quality record control</p> <p>Amend Para 5.13.2 - Requirement of delivery documentations</p> <p>Amend Para 6.2 Table - Changes submission deadline added</p>	KH Jung	HC Lee	SW Kim

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1. Purpose

This requirements specifies quality assurance requirements for any part, sub-assembly, or the final assembly product that are outsourced to the suppliers of Hanwha Corporation Aerospace Division(hereafter "Hanwha").

2. Scope

2.1 The outsourced items are classified according to the criteria below.

Classification	Type	Remark
Group 1A	Final assemblies or single unit components	<ul style="list-style-type: none"> * Final assembly for Fuel tank/Pedal assembly/FQMS/Electronic controllers, etc. * Items that are purchased directly from overseas supplier such as rotary actuator, control module, rotor brake assembly
Group 1B	Detail parts or outsourced /purchased items for sub-assembly	<ul style="list-style-type: none"> * Detail parts which are entirely outsourced * Fuel pump motor, electric cable assembly etc.

2.2 This requirements applies to the Suppliers and the subtiers of the suppliers when stated on the contracts or purchase orders.

2.3 Relations to other requirements

Suppliers shall meet all the requirements on the contract and are responsible for providing the relevant products and services to Hanwha. If the requirements on the contract do not conform to the this SQAR the priority shall be given to the requirements of the contract.

2.4 If the requirements on this SQAR cannot be met, the suppliers must notify Hanwha and discussion shall be done prior to signing the contracts and receiving the purchase orders.

2.5 Suppliers shall comply with the latest revision of this requirements. When the increased of the manufacturing cost caused by revision, the suppliers must notify Hanwha's purchasing department for discussion.

3. Applicable Documentations

3.1 Aerospace Standards

3.1.1 AS9100 "Quality Management Systems - Requirements for Aviation, Space and Defence Organizations"

🔗 Web site address: <http://www.sae.org/standardsdev/aerospace/hotaero.htm>

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3.1.2 AS9102 "Aerospace First Article Inspection Requirement"

☞ Web site address: <http://www.sae.org/standardsdev/aerospace/hotaero.htm>

3.2 KDS0050-9000 "Defense Quality Management System Requirements for ROK Government"

☞ Web site address: <http://www.dtaq.re.kr>

3.3 Hanwha Engineering Documentations

Quality and engineering documentations applied on the drawings and specifications of the items found on the contract or purchase order.

4. General Requirements

4.1 Suppliers shall confirm requirements stated in this document(SQAR) and establish a quality system which can ensure the requirements prior to provision of the products and services.

4.2 Suppliers shall prepare a quality plan based on this document(SQAR) and submit it to Hanwha within one month after contract and/or purchase order receipt if requested by Hanwha QA or contract and/or purchase order. After getting an approval from Hanwha, the quality plan can be applied to the production.

4.3 Additional Quality Assurance Requirements

Supplier shall meet the following quality requirements in addition to the quality assurance system specified in this document.

4.3.1 Quality assurance/inspection requirements that specified on the drawing and specification of the product.

4.3.2 Quality assurance/inspection requirements stated on the relevant government policy and documents that related to the contract.

4.3.3 Additional quality requirements(Q0000) stipulated in the purchase order with Q1000.

4.4 Suppliers shall perform inspection on all the products prior to its delivery, and the relevant reports shall be submitted to Hanwha. (Refer to Para 5.13)

4.5 Suppliers shall discuss all the engineering concerns which arise during the production with quality assurance team and manufacturing engineering team of Hanwha prior to starting any operation.

4.6 Hanwha and Hanwha's customers or regulatory agencies are authorized to evaluate and verify, suitability of the quality management system and the products on the suppliers facility based on contract requirement.

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4.6.1 Suppliers shall provide quality records, equipments, and personnels required for such evaluation and verification.

4.6.2 Suppliers shall not utilize such verification method used by Hanwha as a means of accepting products.

4.7 Suppliers shall ensure that its employees are aware of all the quality assurance requirements and apply them to production of the relevant items.

4.8 Control of subcontracting

4.8.1 Suppliers shall not outsource and procure any items on the purchase order from Hanwha. Prior approval is needed, if supplier wants to outsource or procure. Any violation on outsourcing and procurement requirements will be resulted in void of the contract, and financial loss which is incurred by this matter shall be compensated by supplier.

4.8.2 Suppliers shall confirm and guarantee the compliances of sub-contractors based on Hanwha SQARs such as production processes, quality assurance activities and its control. In addition, suppliers shall flow-down Hanwha SQARs to sub-contractors and get prior approvals from Hanwha in writing when they need to use any sub-contractors for outsourcing operations and procurements.

4.9 Suppliers shall acquire the inspection equipment/gauge required for production and inspection of the products ordered by Hanwha, but under reasonable circumstances Hanwha may provide the necessary equipment/gauge. However, Hanwha will have to verify possession of such equipment/gauge or availability of rental equipment/gauge to be used prior to providing such equipment/gauge.

4.10 Suppliers shall devise a proper means of preventing damage or loss of the inspection equipment/gauge rented from Hanwha. If any damage or loss occurs attributing to the suppliers, the suppliers shall reimburse for such damage/loss at their own cost.

4.11 Suppliers shall establish proper procedures to control and comply with all technical and engineering data(including digital data) which are provided by Hanwha and generated by suppliers. Unless otherwise requested by Hanwha, suppliers shall only use the latest and validated revision level, and apply them to each production exactly. If any technical and engineering data related to delivery items need to be changed, suppliers shall inform and discuss with Hanwha in advance.

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4.12 Suppliers shall establish a procedure to control tools and fixtures including its numbers and grades. If there is the special tool or fixture, suppliers shall submit its control plan.

4.13 Supplier shall not change or revise Traveller, Planning, Tool/Fixture and CNC/CMM Programs that provided by Hanwha in any events. If supplier produces Flight Safety Part and Vital Part, supplier shall get an approval on all changes from Hanwha in advance to use each changed item. Furthermore, all records and documents on change process shall be kept properly.

4.14 If Hanwha especially requested based on the program/business, suppliers shall prepare all documents and records in English related to its production activities.

5. Quality Assurance Requirements

5.1 Quality Management System Requirements

5.1.1 Suppliers shall establish quality management system that can comply the all the requirements of the Hanwha SQAR.

5.1.2 When contract/purchase order (between Hanwha and supplier or between Hanwha and Hanwha's customer) request, suppliers shall establish quality management system which can satisfy AS9100 requirements. After establishment of the QMS, supplier shall attain and maintain the certificate from certification body which is registered by IAOG.

☞ Web site address : https://www.sae.org/?PORTAL_CODE=IAQG

5.1.3 Suppliers shall submit the plan in writing to get the AS9100 or ISO9001 certification and obtain conditional approval from Hanwha if supplier does not have any international quality management system certification or the certification is cancelled.

5.2 Purchase and Management of Raw Materials

5.2.1 In case suppliers purchase raw materials, standard hardwares and components, the suppliers shall establish proper procedures for obtaining raw materials and parts to be applied to the production.

5.2.2 Suppliers shall procure all the quality assurance documents including certificates of conformance and inspection/test reports of all the raw materials, standard hardwares and components that are purchased from overseas, and they shall conduct quality inspections to accept only the raw materials and parts to be used for production.

5.2.3 Suppliers shall provide Hanwha with test samples and/or quality documents to verify reliability of the product quality and to confirm traceabilities.

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5.2.4 Suppliers shall record and control all the quality assurance related documents about the raw materials, standard hardwares and components. Upon request, the Supplier shall be capable of retrieving and delivering required records to Hanwha

5.2.5 Suppliers shall establish a procedure to be used to keep the identification of the specification, serial number, and batch/lot number intact. The suppliers shall also record traceability information of the raw materials and verify it with the actual raw materials and parts before they are put into the production.

5.2.6 The remainder of raw materials which is provided by Hanwha, shall be returned to Hanwha, when all the delivery on the purchase order is completed.

5.3 Traceability Control

5.3.1 Suppliers shall establish a procedure to identify and control traceability throughout receiving, storage and overall production process of the raw materials and parts.

5.3.2 Traceability control of materials and products are to be implemented throughout entire the production process. Mixing of counterfeit items and Batches/Lots should be prevented in any circumstance. Hanwha can request compensation to the supplier when any financial loss or aircraft accident which is caused by the mixture of counterfeit items and Batches/Lots.

5.3.3 If a traveler is furnished to the supplier along with raw materials, it shall be maintained and controled together with the raw materials throughout the storage, production, and shipment.

5.3.4 Suppliers shall include traceability information in the delivery document package of the products.

5.4 Nonconforming Products Control

5.4.1 When nonconformance is found during a production process, suppliers shall identify, separate, and keep the nonconforming products in a bonded area or MRB crib where is designated nonconforming materials.

5.4.2 Suppliers shall establish a documented procedure which can control disposition action for the nonconformance products that are quarantined. When nonconformance report is required, it shall be documented by supplier. Nonconformance report shall include root cause analysis and corrective actions, and documented nonconformance report shall be submitted to Hanwha, to get its disposition. (Hanwha SRR form can be used)

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5.4.3 It shall be ensured that non-conformances products can not be shipped to Hanwha without approval.

5.4.4 Suppliers shall identify the scrap product by using engraving tools including part number, Job number and batch number. In addition, suppliers shall record and maintain the scrap list and submit the photograph of them if Hanwha requests.

5.4.5 NOE (Notification of Escape)

Suppliers shall submit the NOE in writing including following items when any nonconformance is found in their processes or products and it affects products delivered to Hanwha already.

5.4.5.1 Defective processes or operations or products and its description

5.4.5.2 Detail on the defects (Requirement, actual condition, etc)

5.4.5.3 Serial numbers, Lot/Batch numbers

5.4.5.4 Delivered quantities and each date

5.4.5.5 Purchase order numbers or invoice numbers

5.4.5.6 A signature of the representative (Quality Director or CEO) of the supplier

5.5 First Article Inspection

5.5.1 Suppliers shall perform a first article inspection on the items that are put into production process for the first time. Then they should fill out and submit the first article inspection report to Hanwha for approval. These items for which the FAIR is submitted, shall meet the requirements of the purchase order and the drawings.

[5.5.2 Suppliers shall deliver next production batches after getting an approval of First Article Inspection\(FAI\) from Hanwha.](#)

5.5.3 Suppliers shall comply with the latest revision of AS9102 during the first production run of each part number and record the results in FAIR Form 1, 2 and 3 accordingly. The supplier's procedure for FAI may be used in lieu of AS9102 after the approval of Hanwha in writing.

[5.5.4 Suppliers shall record and maintain the FAIR documents, and provide Hanwha with duplicated documents of production record and reports including the FAIR for the first article delivery.](#)

5.6 Control of Process for Production, Inspection and Test

[5.6.1 Suppliers shall prepare production documents \(travelers and process Layout Sheet\) when requested by Hanwha, supplier shall submit the documents to get an approval from Hanwha within 30 days after receipt of purchase orders or 7 days before implementing its production. Where applicable, suppliers shall discuss with Hanwha to use the production documents prior to its approval. Information of the relevant equipments, fixtures, and softwares shall be stated on these documents.](#)

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[5.6.2 Suppliers shall conduct inspections for all products and maintain the inspection reports. If requested by Hanwha, suppliers shall submit the reports to Hanwha.](#)

5.6.3 The characteristics and measured data shall be indicated using the units required by the drawings.

5.6.4 Suppliers shall maintain and control the items being produced along with their travelers in order to verify and confirm the current status of the production and results of the performed inspections. Inspectors shall stamp on the travelers when each operation is complete.

5.6.5 Suppliers shall identify and properly store the products being produced in order to prevent mixture of the products between production processes.

5.6.6 Suppliers shall establish a procedure to prevent damage and corrosion during the production process and take proper actions accordingly when damage or corrosion occurs.

5.6.7 Quality inspection by suppliers shall be performed on the entire units. However, if a sampling inspection is to be performed, the suppliers shall propose the developed sampling methods and the process control plan and have them approved for application. A proper means of sampling shall be selected according to the specifications of ISO 2859, ANSI/ASQC Z1.4, and MIL-STD-105, and the selected sampling method shall be referred to for its approval.

5.6.8 Suppliers are responsible for understanding and reducing variation between each production operations, and use of a statistic technique such as a control chart is recommended.

5.6.9 Suppliers shall perform self inspection and first off inspection on every batch for all the operations. Discrepancies of the batches shall be prevented by verifying and confirming the inspector's stamp and inspection records. Production of the remaining units may be carried out only the if the result of FAI is satisfactory.

5.7 Source Inspection and Support Quality activities

5.7.1 Hanwha may send its own inspectors to the supplier's facility to carry out source inspections on the purchased products prior to shipment. The Supplier shall provide the necessary access, equipment and resources required to effectively accomplish the source inspection.

[5.7.2 Suppliers shall deliver the source inspection products after the confirmation by a DQR\(designated quality representative\) who is certified by Hanwha. the DQR shall complete inspections and stamp or write his signature.](#)

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[5.7.3 Suppliers shall submit a source inspection request to Hanwha to get an approval for the deliveries of each source inspection product if the supplier does not have DQRs.](#)

5.8 Corrective and Preventive Action

- 5.8.1 Suppliers shall carry out corrective and preventive actions in order to preclude reoccurrence of the same nonconformance and present the proof when requested by Hanwha.
- 5.8.2 Suppliers shall respond to the corrective action request issued by Hanwha in timely manner before the response due date and send result of the actions taken. If suppliers need more time to respond officially to Hanwha, suppliers shall submit a formal request in writing to extend the deadline in advance.
- 5.8.3 Hanwha can prohibit all deliveries of the supplier until the official response is received and its action is confirmed when the due date is expired over 15 business days without any notice or request.

5.9 Personnel Qualification and Certification

- 5.9.1 Suppliers shall establish a qualification and certification plan which **can** evaluates suitability of the operators **who carries** out necessary operations to produce the purchase ordered items on the contract.
- 5.9.2 Inspectors who perform a final quality assurance inspection on products ready for shipment shall be qualified as designated quality representative(DQR) by Hanwha.

5.10 Special Process Control

5.10.1 Suppliers shall acquire verification and approval from Hanwha and Hanwha's customers in order to perform the following operations if required for the production process.

Classifications	Processes
Heat Treating Process (HT)	Heat treatment of Steel, Alloy, Stainless Steel, and Aluminium etc.,
Chemical Process (CP)	Plating, Painting, Coating, and Dry Film Lubrication etc.
Non Conventional Machining (NM)	Electric Discharge Machining etc.
Surface Enhancement Process (SE)	Shot peening, Blasting etc.
Non Destructive Testing (NDT)	MT, PT, UT, ET, RT etc.

※ Any additional operations which are not listed above shall be approved by Hanwha and Hanwha's customers if the operation is defined as a special process by customers.

5.10.2 Special process shall be conducted by a manufacturer approved by Hanwha, and Hanwha's approval shall be acquired prior to selecting a manufacturer to carry out special processes.

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5.10.3 If the special processes mentioned above are required by Hanwha or other customers, NADCAP (National Aerospace and Defense Contractors Accreditation Program) approval shall be acquired for the relevant processes.

☞ Web site address: <https://www.eauditnet.com/>

5.11 Flight Safety Parts Control

5.11.1 Suppliers shall establish a control plan which fulfill the requirements for the contracted or purchase ordered items that are illustrated as titles below. Requirements for control of such items are considered as additional quality requirements and thus can be reflected on the purchase order and contract.

- FSP (Flight Safety Parts)
- CSI (Critical Safety Items)
- Vital Parts

5.11.2 Suppliers shall prepare manufacturing documents for the flight safety parts and have them approved by production engineering team and quality engineering team of Hanwha prior to applying to the production, and these documents shall be classified as "Frozen Process" for control. Manufacturing documents and any documents prepared for the same purpose shall include the following information.

5.11.1.1 Revision History

5.11.1.2 Part Number, Part Number, Drawing No./Rev. No., and Serial Number

5.11.1.3 Identification of "Flight Safety Parts"

5.11.1.4 Material Condition and Traceability Information Such As Required Dimensions and Applied operations

5.11.1.5 Production, Test, Inspection, and Acceptance Status of Each Operation

5.11.1.6 Any operations with critical characteristics shall be illustrated as "Critical Characteristic Process".

5.11.1.7 Information regarding tool, fixture, and program

5.11.1.8 Means of specially packaging, storing, and identifying certain materials

5.11.3 When manufacturing documents for "flight safety part" are revised, suppliers shall have the documents approved by Hanwha in the same process as the initial approval to be applied to the production.

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5.12 Quality Record Control

Suppliers shall retain quality records for at least 15 years and present the documents to Hanwha within the specified period of time upon its request. Suppliers shall get an confirmation from Hanwha QA when they want to discard any quality records of defence/military products.

5.13 Delivery Control

5.13.1 Suppliers shall devise a means of preventing damage and corrosion of products during their delivery by predicting various circumstances that may affect the conditions of the products.

5.13.2 The shipping documents that need to be enclosed with the products are as follows.

Shipping Units		Detail Part	Assembly Parts	Purchased directly from overseas Suppliers
Certificates of Conformance		●	●	●
Traveller	Hanwha provided	If applicable	If applicable	If requested by Hanwha or required by its contract or purchase orders
	Supplier Own	▲*	▲**	
Inspection Report of Raw Material/Parts		●	▲**	
Inspection/Test Report		●	●	
Special Process Inspection Report or Certification		●	▲***	
Performance Test Report		N/A	●	
First Article Inspection Report		●	●****	

- * Required if the products are first article, inspected Partial/Delta first article or Re-first article
- ** Required if the assembly products(include subassembly and detail parts) are first article, inspected Partial/Delta first article or Re-first article, and the supplier is changed
- *** Required if the assembly products(include subassembly and detail parts) are first article, inspected Partial/Delta first article or Re-first article, and the processor is changed
- **** The assembly products shall include all FAIRs of sub assembly products and detail parts

5.13.3 Suppliers shall not deliver any unauthorized copy, substitute and counterfeit products.

6. Responsibilities of suppliers

6.1 Suppliers shall report to Hanwha within 1 business day when any cancellation of accreditation on supplier's quality system issued by a 3rd party certificate authority.

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6.2 Suppliers shall submit a notification including action plans to Hanwha in writing for the discussion when following changes happened.

Classifications	Documents submitted	<u>Submission</u>	Hanwha's Action
Change of Business Top Management	Result of Quality Impact Review	<u>within 15 days after the change date</u>	Re-evaluation/ Re-approval based on review result
Change of Quality Organization/Director	Result of Quality Impact Review	<u>within 15 days after the change date</u>	
Change of Plant Location	Result of Reviewing Impact on Quality System and First Article Inspection Plan	<u>within 30 days in advance</u>	
Change of 4M	Plan to Reconduct First Article Inspection	<u>within 15 days in advance</u>	

7. Required Forms and Records

No.	Forms & Records	Document No.	Remark
Attachment 1	Certificate of Conformance (COC)	QC-SQAR-01-A	Supplier format can be used
Attachment 2	Supplier Rejection Report (SRR)	QC-SQAR-02-A	