

Global Supplier Quality Manual



DOOSAN



Bobcat.

Global Supplier Quality Manual

Doosan Bobcat Global Sourcing provides our dealers, customers, shareholders, and employees with a sustainable, competitive advantage by developing a world class supply base. Global Sourcing is passionate about collaborating in a boundaryless way to achieve premier supplier performance.

We are committed to the Doosan Bobcat vision of becoming one of the world's top three construction equipment manufacturers through our commitment to quality, reliability and durability. This can be achieved by providing a competitive advantage through the selection, development and management of suppliers capable of delivering best in class products in terms of quality, delivery, cost, technology, and services.

In order for our products to meet worldwide customer expectations across all Doosan Bobcat brands, both Doosan Bobcat and our suppliers need to be committed to a ZERO-DEFECT APPROACH. We challenge our suppliers to be best in class in their category for quality, delivery, cost, and service while promoting a culture of continuous improvement through our efforts in Total Quality Management.

We believe that our suppliers are an extension of our operations because they account for over 70% of our manufacturing costs. Therefore, we are highly dependent on our suppliers to achieve our company vision and objectives and we are determined to develop long-term relationships through extensive actions to support their development and manufacturing competitiveness.

Doosan Bobcat recognizes the suppliers that exceed expectations by rewarding them with increased business. Suppliers that do not meet quality, delivery, and cost commitments will be held responsible for such failure and may be excluded from new business or even from the Doosan Bobcat approved supplier list.

With your commitment to deliver the highest quality and service level, together we will succeed in our mission to deliver a competitive advantage while developing strong, long-term, structured relationships beneficial to the future of both Doosan Bobcat and its suppliers.

The involvement of suppliers within this relationship will be managed through this manual which offers a standardized global approach to our supplier partnerships.

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I. INTRODUCTION TO GSQM

The purpose of the Global Supplier Quality Manual (GSQM) is to communicate to our suppliers the global Quality requirements of Doosan Bobcat.

This section introduces the goals and the expectations that come with the administration of the manual. The outlined requirements in this manual shall be considered a material part of any existing or future supply agreements/contracts with the supplier.

This manual applies to all suppliers of production and service parts, as well as outsourced services (e.g., painting and plating), provided to the Doosan Bobcat Global Operations as listed in section VIII.

Please note that:

Doosan Bobcat boasts such globally recognized brands as Doosan®, Bobcat®, Doosan Portable Power®, Geith®, Ryan®, Steiner® and Earthforce by Bobcat®.

1.1 GOALS FOR THE MANUAL

The GSQM aims to provide a platform to:

- Communicate Doosan Bobcat's expectations and minimum requirements for all suppliers of production materials, products, and services.
- Establish a general policy, standard procedures, and guidelines to assure world-class quality systems are maintained throughout the Doosan Bobcat Supply Base.
- Provide a methodology of communication to assure proper flow of information which deals with the notification of any problems, solutions, or ideas to improve Quality, Warranty, Delivery, or Productivity.
- Establish a set of requirements to assure the flawless introduction of a new part or changes into Doosan Bobcat's production.
- Facilitate proactive and continuous improvement in both prevention and corrective actions of quality issues.

1.2 ORGANIZATION OF THE GSQM DOCUMENT

The document is organized into chapters related to Doosan Bobcat main processes as per the chart below.



1.3 RESPONSIBILITIES

- **Doosan Bobcat Assigned Quality Representative:**

Throughout the manual, references are made to the Doosan Bobcat Assigned Quality Representative (AQR). An AQR can be a representative from Sourcing (Commodity Leader), Supplier Development (Supplier Development Engineer/Supervisor) or Plant Quality Control Departments (Supplier Quality Engineer).

- **Suppliers:**

It is critical that Suppliers become fully knowledgeable of the GSQM content so that they understand how, when, and why submissions and documentation are provided to Doosan Bobcat. This manual is intended to serve as a tool for the supplier to communicate preventive and corrective actions to its customer.

It is therefore required that:

- Appropriate management level within the Supplier Organization shall review the content of this manual.
- Supplier shall access the latest version of the Doosan Bobcat GSQM via Global Partner Connect (GPC)/other and ensure communication within its own organization interfacing with Doosan Bobcat. If the supplier is serving a region that does not currently utilize GPC, they should reach out to their AQR.
- Supplier shall use the forms and format referenced within this manual, unless approved by the Doosan Bobcat Assigned Quality Representative.

This manual becomes effective upon its issuance to a supplier who is approved to do business with Doosan Bobcat.

Doosan Bobcat strives for effective and good relationships with its suppliers. Suppliers are encouraged to contact their AQR if questions or clarification are needed about the GSQM or if the supplier foresees an issue meeting these requirements.



II. GENERAL REQUIREMENTS

Suppliers shall provide 100% Quality parts/services with 100% On-Time Delivery performance in accordance with Doosan Bobcat schedules. The supplier shall provide Doosan Bobcat with appropriate planning and corrective actions in any case where this requirement cannot be met. Suppliers shall continually strive to enhance product quality and manufacturing productivity to meet and exceed our customer expectations.

All suppliers shall be compliant with the latest version of ISO9001 and are encouraged to implement IATF 16949, ISO14001 and ISO45001 as evaluated by an accredited registrar. Any change in a third-party approval/certification status must be communicated in writing to Doosan Bobcat within 30 days. This includes supplying updated certificates as they expire and/or are extended. All notifications must be made in writing to your Doosan Bobcat Sourcing Category/Commodity Representative. All existing suppliers are encouraged to improve their existing quality system to meet ISO9001 requirements if they are not already compliant. A timeline for meeting these requirements can be established by contacting your AQR. Doosan Bobcat may choose to conduct annual site audits to verify a supplier's compliance.

Doosan Bobcat reserves the right to access supplier facilities which have a significant impact on the final quality of products. In addition to the guidelines specified in "Section 5.1 Management of Defects (Non-Conformity)", Doosan Bobcat shall be granted access to supplier facilities within a reasonable timeframe given proper notice.

Suppliers are expected to fully comply with Doosan Bobcat expectations as well as maintain a Quality System that encompasses the following.

2.1 INTERNAL PROCEDURE

Suppliers must develop, implement and maintain written procedures for control and continuous improvement of quality for the products and services provided.

2.2 QUALITY PLANNING & NPD

Quality Planning is essential to foster continuous improvement, defect prevention and process optimization. Quality Planning is required during all phases of New Product Development (NPD). Quality Planning is a living system that must be maintained throughout all phases of the product life cycle. Preferred Quality Planning methods for direct materials are detailed in the AIAG Advanced Product Quality Planning and Control Plan (APQP) manual, and Production Part Approval Process (PPAP) manual.

A detailed description is provided in Section IV hereof.

2.3 PROTOTYPING

The supplier may be required to submit prototype parts for functional, dimensional, and materials evaluation. Prototype parts, in quantity, may be required for manufacturing trials at Doosan Bobcat facilities to assess the impact on the entire manufacturing process. These prototype parts (including their timely delivery) are an important

step in Doosan Bobcat Process development and are preferred to be from the Supplier Production process. For the delivery of prototype parts, it is important that the supplier provides a firm commitment and adheres to the agreed prototype part delivery schedule.

The supplier is required to document any relevant dimensional and test results from prototype builds. These results will be submitted to Doosan Bobcat unless directed. The supplier must also specify if a prototype part or component was made from production processes and/or tooling, or from non-production processes and/or tooling.

2.4 OPERATOR AND INSPECTION INSTRUCTIONS

The supplier shall prepare written operator and inspection instructions for employees who have responsibilities for operation of the process and inspection.

2.5 PACKAGING, LABELING, HANDLING & CLEANLINESS

The supplier is expected to comply with specific packaging instructions and requirements as defined by the Doosan Bobcat manufacturing facility and/or shipping location to include Aftermarket & Attachments. Packaging shall meet all applicable shipping laws, codes, and regulations.

The supplier shall ensure that all Doosan Bobcat packaging is clean and free from dirt, debris, foreign materials, and damage. Suppliers will establish and follow packaging standards and methods to ensure that material is adequately protected from damage and contamination during transit and handling. Every effort shall be taken to ensure package integrity.

It is expected that packaging will be designed to perform several functions during transportation, storage and point-of-use, including:

- Help reduce inventory requirements (e.g. via small-lot ordering).
- Provide efficient and ergonomically acceptable manual and/or mechanical handling.
- Reduce environmental impact - recycling and minimizing disposal.
- Provide input for adequate quantity of containers to meet changing production requirements and replace lost or damaged containers.

Suppliers providing product to multiple Doosan Bobcat manufacturing locations shall work with each of the locations to assure that the specific needs of each of the manufacturing locations are met.

Packaging shall be labeled in accordance with all Doosan Bobcat standards, unless otherwise specified, and shall meet Doosan Bobcat specifications or requirements:

- ✓ Packing slips shall be attached to the carton exterior and adequately secured until point of use.
- ✓ Each shipment shall be marked with the Doosan Bobcat part number, supplier part number, revision level, quantity, lot number, Doosan Bobcat site name, address, gross weight in kgs. (or pounds based on regional requirements), and any other specified requirements as applicable.
- ✓ Supplier shall identify items(s) and/or package(s) container(s) of shelf-life material with the manufacture date or the expiration date along with any special storage and handling conditions, in addition to the normal identification requirements. If not otherwise specified, a minimum of 75% shelf-life must be remaining upon receipt at the Doosan Bobcat site.
- ✓ Application of rust preventative substances must be compatible with Doosan Bobcat lubricants and hydraulic fluids. Safety Data Sheets (SDS) must be submitted to the AQR or Environmental Safety and Health.

Failure to comply with Doosan Bobcat packaging and labeling requirements will result in the generation of a Supplier Defect Report (SDR).

All returnable packaging and dunnage must be clean and free from dirt, debris, foreign material and damage. Doosan Bobcat reserves the right to charge back reasonable cleaning, repair, or replacement fees that are proven to be the fault of the supplier.

2.6 PURCHASED PART CONTROL & MANAGEMENT OF TIER-2 SUPPLIERS

Doosan Bobcat Global Sourcing requires that the supplier have the full responsibility for quality assurance of their sub-suppliers and should ensure compliance of their sub-suppliers with the latest Quality system ISO9001 or IATF 16949. The supplier must maintain qualifications for sub-contractors to ensure and control the quality and traceability of all components and raw materials purchased through them. The supplier should also ensure they flow and enforce the requirements of this manual down to/through their supply base.

Doosan Bobcat reserves the right to directly assess 2nd tier processes which have a significant impact on the final quality of products. Doosan Bobcat may at times specify the utilization of certain 2nd tier suppliers for critical applications.

Suppliers are responsible for managing the approval of their supply base products and processes in accordance with the requirements of PPAP. Request for sub-supplier changes shall be directed to Doosan Bobcat AQR according to the Supplier Product/Process Change Request process (refer to Section 5.2 hereof).

2.7 KEY PRODUCT CHARACTERISTICS

Doosan Bobcat specifies the use of symbols to identify key product characteristics that affect safety, codes and standards, regulations, fit, form, function, and appearance. These characteristics shall be identified on drawings prior to quote and identified with unique symbols. Symbols may vary by Doosan Bobcat location. Discussions with the supplier shall be held early in the process to review, jointly discuss and agree on special product-process-test features (cosmetic-functional) where verification is MANDATORY. Any concerns by a supplier on the ability to meet the requirements should be communicated as early as possible. The Doosan Bobcat Supplier Feasibility Review process shall be leveraged in identifying key product characteristics.

It is important that the supplier identifies the special characteristics in their FMEA, Control Plan & Work Instructions and ensures that the appropriate controls are in place. Assignment of Key Product characteristics does not reduce the importance of any other characteristic on a drawing. Every tolerance is absolute and shall not be exceeded regardless of classification.

2.8 PROCESS CAPABILITY

There shall be a process in place to ensure and monitor ongoing process capability. As appropriate, a Statistical Process Control (SPC) Plan and supporting data for special part and process characteristics must be kept on file as required. All significant or critical drawing characteristics (unless otherwise specified) shall be controlled with SPC and variable gauging as applicable. The capabilities must be identified in the Control Plan and adhered to. This data may be required with each shipment at the discretion of the Doosan Bobcat AQR.

The supplier shall use a minimum sample size of 30 parts unless approved by Doosan Bobcat AQR. Product family data using same process may be used to support capability analysis. The supplier shall identify, evaluate and, wherever possible, eliminate special causes of variation prior to PPAP submission. The supplier shall notify Doosan Bobcat of any unstable processes that exist and shall submit a corrective action plan to Doosan Bobcat.

The purpose of the initial process capability study is to understand the amount and sources of process variation. When adequate historical data of at least 100 samples is available, control charts can be utilized to show stability and in-control process. Once the process is stable, Ppk and Pp can be calculated. When adequate data is not available (<100 samples), consult with your Doosan Bobcat AQR for suitable plan. In addition, capability studies in support of prototype builds must be based on a minimum sample size of 30 with clear communication of whether prototype or production tooling was utilized.

The supplier shall use the following as minimum acceptance criteria for evaluating initial process capability study results:

RESULTS	INTERPRETATION
PPK, CPK > 1.33 (>1.67 FOR SAFETY FEATURES)	The process capability is acceptable and meets minimum customer requirements. After approval, begin production and follow Control Plan. Work on improvement to ultimately reach the target of >1.67
1.00 ≤ PPK, CPK < 1.33	The process capability is marginal and requires immediate improvement. Contact your AQR and review results of the study. This will require changes to the Control Plan. If not improved prior to Start of Production, 100% inspection may be required by Doosan Bobcat.
PPK, CPK < 1.00	The process capability is unacceptable does not currently meet the acceptance criteria. Will require 100% inspection until proven capability. Error-proofing may be required until ongoing Ppk of 1.33 is demonstrated

2.9 TOOLING, MEASURING AND TESTING EQUIPMENT

All tools, manufacturing, tests, or inspection equipment belonging to Doosan Bobcat shall be used exclusively for Doosan Bobcat products unless an authorization in writing has been issued by Doosan Bobcat Sourcing.

All Doosan Bobcat-owned tooling, capital assets, gauges and fixtures shall be identified with an asset number for tracking purposes as per the purchase order terms and conditions. The supplier shall establish procedures for the permanent identification and tracking of Doosan Bobcat supplied product and equipment including preservation of the asset number. Periodic audits of availability and condition will occur.

The supplier shall notify Doosan Bobcat in writing of supplied tooling or gauges that are lost, damaged, or are otherwise unsuitable for use. Doosan Bobcat supplied tooling and gauges shall not be disposed of without written authorization from Doosan Bobcat Sourcing. Supplier shall be responsible for calibration, proper storage, and maintenance of the supplier product and equipment. Upon program completion, the supplier shall ensure gauges & tools are properly stored to prevent any damage and are readily available for service requirements.

2.10 TOTAL PRODUCTIVE MAINTENANCE

The supplier should implement a Total Productive Maintenance (TPM) program to emphasize operator involvement and ownership of equipment performance. Suppliers shall be required to perform preventive maintenance on equipment and tools, encouraging the use of predictive and autonomous maintenance in compliance with TPM.

For Doosan Bobcat-owned tooling, Doosan Bobcat may require the supplier to submit a preventive maintenance program to the AQR for approval.

2.11 PROCESS CONTROL GAUGES & ACCEPTANCE CRITERIA

The supplier must establish, implement and maintain a procedure to verify the acceptability of all gauges, tool masters, fixtures and measurement/test systems at specified intervals to ensure the integrity of the systems. The procedure must be documented, regularly updated and compliant to ISO10012. The supplier shall meet gauge lab certifications in compliance with Industry Standards and use accredited laboratories. Supplier's laboratory shall be compliant to ISO17025.

Adequate gauges and measuring and testing equipment for process control are mandatory. This equipment is to be provided by the supplier for their own use and, where feasible, must be designed to provide variable data. Variable gauges must be used to measure key product characteristics. Gauge Measurement System Analysis (MSA) studies shall be performed prior to calculating Process capabilities.

The supplier shall be responsible for:

- ✓ Design of the gauge & acquiring gauge design approval from Doosan Bobcat.
- ✓ Initially certifying the gauge to within 1/10 of the specified tolerance.
- ✓ Successfully completing Measurement System Analysis.
- ✓ Maintaining Gauge calibration.

The Gauge R&R results shall not exceed 30% with less than 20% preferred. For Critical CTQs, results shall not exceed 10% and must be reviewed by Doosan Bobcat AQR to be approved when between 10% and 30%.

The supplier must proactively notify Doosan Bobcat AQR when a product is shipped after being approved by a measurement system operating outside of agreed-upon limits of variation. The Supplier Product-Process Change Request (SPCR) process must be used for these cases.

2.12 MATERIAL IDENTIFICATION & TRACEABILITY

The supplier is required to establish a quality system for the identification and the control of all production materials. Traceability should be optimized to limit the exposure of failures in case of non-conformity, minimizing product recalls, and facilitating expertise and analysis of root causes. The supplier should align with Doosan Bobcat client plant(s) to understand any additional requirements for this topic.

Identification at all times shall address traceability via serial number (if required), lot numbers, date code, barcode, and/or other means as applicable.

The quality system shall ensure an effective identification and traceability back to:

- Finished product; Subcomponents, to include those specified as critical by Doosan Bobcat; Raw material

- Version tracking/revision levels of supplier-loaded software
- History of the manufacturing process:
 - Inspection and test operations
 - Key process parameters
 - Maintenance of equipment, jigs, gauges, and other measurement devices
 - Operators and personnel qualification
 - Rework operations
 - Product-Process characteristics records (control plan)
 - Sub-supplier procedures
 - Key machine settings

2.13 RECORDS

Quality records shall be maintained so they remain legible, are available for review upon request, and may be in any media such as electronic or hardcopy. Records shall include accurate, updated, and complete quality data. The supplier must retain adequate quality system records, including all advanced quality planning documents, process guidelines, laboratory test instructions, gauge/test equipment verification, calibration, and performance test methods or international documentation, process documentation, or other information as applicable, and required. Records shall be kept for defective components and assembly processes to highlight problem areas and trends.

Unless instructed differently by your Doosan Bobcat AQR, the below retention periods shall be regarded as a minimum:

• Product Safety Production Materials Records (Control charts, inspection, test results, functional, product audits, layout inspection, material certifications)	Permanent
• Production Materials Records (Control charts, inspection, test results, functional, product audits, layout inspection, material certifications)	10 years
• APQP & PPAP documents (Spec, Drawing, PFD, PCP, FMEAs, Instructions, Gages & Tooling, Qualification.....)	10 years
• Records of Non-Production Materials and Quality System (internal audits, management reviews)	3 years

2.14 FIFO REQUIREMENTS

The supplier shall implement a First-In First-Out (FIFO) management system for inbound, in-production, and outbound materials.

2.15 DRAWING AND CHANGE CONTROL

The supplier's quality system must ensure that the appropriate engineering drawings and specifications (including latest customer revision levels) are controlled, released, and available at all the manufacturing, test or inspection locations.

2.16 INTERNAL AUDITS

A supplier must conduct & document regular internal audits to ensure continued compliance with internal procedures and customer requirements.

2.17 COMMUNICATION

All documentation and information shall be communicated to Doosan Bobcat in English, unless otherwise specified by the AQR. This requirement applies to all requests for records and documentation submitted to Doosan Bobcat as specified in this manual.

2.18 BUSINESS CHANGES

Any significant changes in business climate such as acquisitions, divestitures, pending litigation, or any activity that may change the financial viability of the supplier's organization must be communicated to the Doosan Bobcat Category/Commodity Representative. Radical changes in business demands that strain supplier's capacity or their Supply Base capacity shall also be reported to the Doosan Bobcat Category/Commodity Representative.

2.19 GOVERNMENT, SAFETY & ENVIRONMENTAL REGULATIONS

Also refer to the Doosan Bobcat Supplier Code of Conduct policy.

Doosan Bobcat requires its suppliers to demonstrate responsible business operations by measuring and reporting its sustainability efforts. Environmental, Social and Governance (ESG) initiatives measure and aim to improve the impact a company has on its employees, consumers, the environment, and community. Upon request, suppliers may be asked to send to Doosan Bobcat a copy of any annual reports involving corporate social responsibility, corporate sustainability, or ESG goals and performance data that the supplier submits to its customers or to any regulatory body.

2.20 NON-PRODUCTION MATERIAL & SERVICE REQUIREMENTS

Suppliers of services and non-production materials to Doosan Bobcat, to include Aftermarket & Attachments, shall be required to comply with all elements of the Global Supplier Quality Manual, unless otherwise directed.

2.21 WARRANTY REQUIREMENTS

Reducing Customer Warranty claims remains a top priority with Doosan Bobcat and Doosan Bobcat places a high priority on overall customer satisfaction and loyalty. Suppliers are expected to demonstrate reliability that meets or exceeds Doosan Bobcat requirements. It is our expectation that suppliers will cover the costs associated with any failure related to their components within the Doosan Bobcat warranty period. For all warrantable parts, Doosan Bobcat requires suppliers to sign a warranty agreement that expressly details the recovery guidelines for expenses related to field failures caused by the supplier's product. The warranty agreement may be included as part of a purchasing agreement or other commercial contract between the supplier and the relevant Doosan Bobcat entity.

If no warranty agreement is in place, Doosan Bobcat will still hold the supplier responsible for field failures related to the design or manufacture of their supplied products. Associated costs and liabilities will be managed on a case by case basis.

The supplier must track and analyze the causes of warranty claims and use the information to improve processes and product quality. The supplier shall provide the AQR with a quarterly report on warranty improvement. The report shall be in an 8D format and have a pareto of failure modes for each impacted part.



III. SOURCING

3.1 GENERAL REQUIREMENTS

Through the Doosan Bobcat Global Sourcing System (DGSS), Doosan Bobcat has established standard processes for awarding business to a supplier. As one of the most important decisions made by Doosan Bobcat Sourcing, the business award directly impacts our ability to deliver the right level of innovation, quality, competitiveness, and service to our customers. The DGSS ensures that there will be the right coordination and contribution of Doosan Bobcat stakeholders in all sourcing decisions.

From the supplier perspective, this chapter describes the requirements and main steps required to ensure compliance with the DGSS.

The following chart specifies the main steps of the sourcing process:



3.2 SUPPLIER PROFILE

All potential suppliers will be requested to provide minimum information about their company, technology, product, processes, services, capabilities, etc. This activity will be conducted through the evaluation of the Supplier Profile.

The supplier is invited to answer any Request for Information and to complete the Supplier Profile template. The purpose of the Supplier Profile evaluation is to get a quick indication of the standards of an existing or potential supplier. This evaluation is performed by exchange of emails and conference calls.

The Supplier Profile template will be provided by the Doosan Bobcat Category/Commodity Representative. Failure to complete the Supplier Profile template may result in the supplier not being selected for the next steps of the sourcing process.

3.3 CONFIDENTIALITY AGREEMENT

A Confidentiality Agreement must be signed by the supplier before entering the Request For Quotation (RFQ) process. This is a pre-requisite to Doosan Bobcat sharing confidential information with the supplier.

Doosan Bobcat Sourcing recognizes the sensitivity of supplier information as it does with its own data and/or information. The supplier is required to treat all Doosan Bobcat data and information in strict confidence. The supplier should report any breach of confidentiality to Doosan Bobcat Sourcing Management immediately.

The Confidentiality Agreement template will be provided to the supplier by the Doosan Bobcat Sourcing.

3.4 REQUEST FOR QUOTATION

During the Request for Quote (RFQ) process, Doosan Bobcat Sourcing expects the supplier to fulfill all RFQ requirements and targets by completing forms and providing required documentation. Doosan Bobcat Sourcing may elect to audit objective evidence that establishes whether the supplier has met those requirements.

Any Request for Quote template will be provided to the supplier by the Doosan Bobcat Category/Commodity Representative.

3.5 QUALIFICATION OF SUPPLIERS



The Supplier Evaluation by Doosan Bobcat will assist in ensuring that the supplier can consistently meet Doosan Bobcat product and service expectations and that the supplier is capable of continuously improving its flexibility in meeting future Doosan Bobcat requirements. When possible and appropriate, these assessments will be performed by cross-functional teams.

As a result of the comprehensive scope of the selection and qualification process, approval by one Doosan Bobcat Regional Sourcing Center may be sufficient endorsement for another Doosan Bobcat group to use that supplier without re-qualification based on their sourcing requirements and circumstances.

3.6 SUPPLIER ASSESSMENT

Along with a business assessment (reference check, financial analysis, etc.) and a review of the quality manual and Supplier Profile results, potential suppliers will be asked to complete a self-assessment questionnaire and an on-Site assessment in accordance with Doosan Bobcat Global Sourcing procedures to assess supplier effectiveness in key areas such as:

- Continuous Improvement
- Corporate Social Responsibility
- Operations
- Environmental, Health & Safety
- Purchasing
- Resource Management
- Sales/Customer Service
- Advanced Product Quality Planning (APQP)
- Quality
- Design & Development
- Operator Interview on Floor
- Process Audit

Based on favorable evaluation of the above information, a supplier can be listed as approved for business with Doosan Bobcat.

Supplier Qualification is site specific and achieved when the supplier (site) satisfies the minimum requirements.

Two types of approval may be granted:

- **Approved**
- **Conditional** (subject to specific corrective actions in a timely manner)

Conditional approval enables Doosan Bobcat to contract with a supplier pending a site assessment and/or corrective action from site assessment. When deficiencies are identified, a response time (not exceeding three (3) months) will be provided for the supplier to define corresponding corrective actions. Failure to provide a suitable response in a timely manner shall be cause for disapproval for further consideration. Disapproval prevents sourcing with the supplier.

If a supplier is not approved, no contract or receipt of material or services is allowed until corrective actions are taken to enable the Supplier to achieve Conditional approval, as a minimum.

3.7 FINAL AGREEMENT

The supplier will be notified of the business award in a form of a Nomination Letter, a Purchase Order, or contract sign-off. Any questions regarding final agreement should be directed to the Doosan Bobcat Category/Commodity Representative.

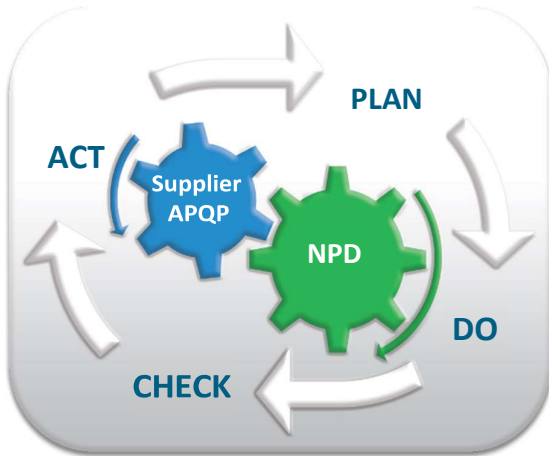
3.8 APPROVED SUPPLIER LIST

An Approved Supplier List is maintained by Doosan Bobcat Global Sourcing from which Doosan Bobcat Category/Commodity Representatives may select suppliers for business allocation based on their performance. Key suppliers are monitored in objective and subjective areas such as Quality, On-Time Delivery, Cost reduction, Process/Product improvement, Innovation, Responsiveness, Business and Financial strength. The information is

organized with a structured method of Supplier Classification to evaluate suppliers and their relationships with Doosan Bobcat.

IV. NEW PRODUCT DEVELOPMENT & SUPPLIER APQP

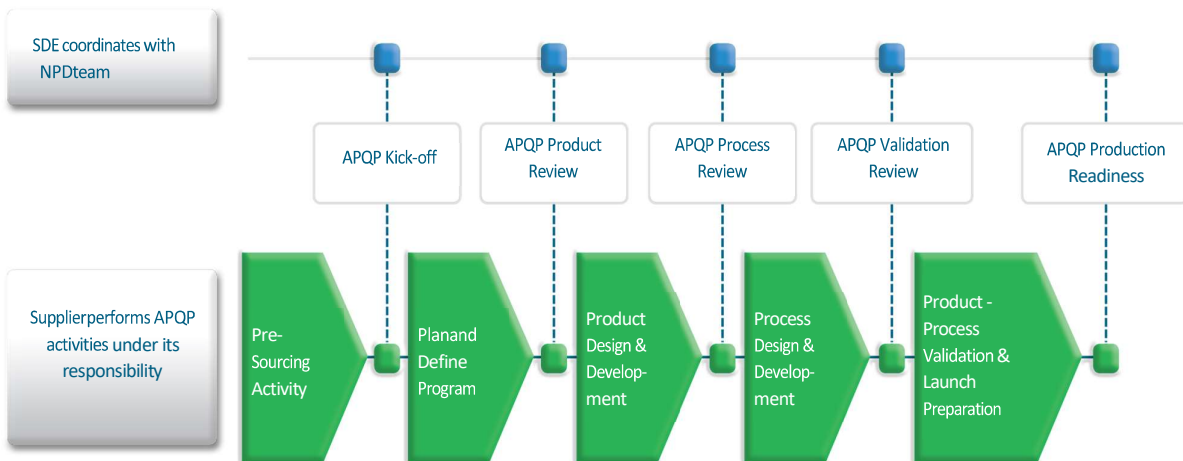
4.1 GENERAL REQUIREMENTS



Product quality begins at design. Therefore, from Initial Product Concept through Production and Service, the supplier must understand and agree on all applicable quality standards and requirements.

The AIAG Advanced Product Quality Planning (APQP) provides guidance and reference for consistent, structured, and preventive processes for managing risks associated with new or revised parts, assemblies, changes in suppliers, or changes in supplier processes.

The supplier is fully responsible for the timely planning, execution, and documentation of all quality planning activities carried out within the framework of AIAG APQP. The supplier shall specify representatives in their organization who are responsible for the individual activities and stipulate the corresponding deadlines. A Doosan Bobcat functional team, supervised by Supplier Development, is responsible for cooperation with the supplier.



The supplier will develop a detailed plan prior to start of the project. The timing plan must be updated on a regular basis to reflect project status and to identify risks that could impact project timing and completion of tasks. The Supplier APQP shall review, analyze and track part/program requirements to ensure timely completion of required items by the supplier and resolution of issues. Suppliers shall participate as requested by Doosan Bobcat.

4.2 KEY COMPONENTS

All parts used in Doosan Bobcat machines are important in nature to satisfy customers and the expected safety, quality, and reliability level of our final products. However, some parts require additional attention. Doosan Bobcat classifies purchased parts to highlight the most critical or high-risk parts in a project, which requires earlier start-up of work, closer monitoring, and follow-up and potentially more extensive quality assurance requirements.

As an example, the classification of critical-key components may categorize purchased parts by one or more of the following criteria:

- Supplier has major design responsibility
- New supplier, new product
- New technology to industry or to Doosan Bobcat
- Complex part critical to the function of a system, including CTQ characteristics
- Critical process likely to cause risks in application
- Expensive part or tooling, complex and new
- Known quality issues or potential concerns
- Safety components, safety concerns
- Long lead time part, extensive testing (complex, time, resource)

4.3 DOOSAN BOBCAT SPECIFIC REQUIREMENTS

In addition to the requirements described in the AIAG APQP publications, Doosan Bobcat defines the following Doosan Bobcat Specific Requirements that shall be planned and supported during the project milestones.

- Supplier Feasibility Review
- Supplier Application Approval
- Supplier Early Production Containment
- Supplier Launch Readiness Review

SUPPLIER FEASIBILITY REVIEWS

The Feasibility Review is a pre-sourcing meeting held with potential Suppliers to review items related to the manufacturability of the part, including timing, design, manufacturing capability, packaging, etc.

The goal of this preventive process is to minimize the need for late design changes after the initial samples or tooling is ordered.

The Supplier should be prepared to discuss how they would meet the customer requirements. A subsequent review may need to be completed by closure of the NPD design phase for any identified open issues. The Feasibility review must ensure all technical information, manufacturing and application considerations defining the part or component has been thoroughly reviewed, is understood and performance by the Supplier is feasible.

SUPPLIER APPLICATION APPROVAL

The Supplier Application Approval (SAA) is a signed agreement between Doosan Bobcat and the Supplier. The SAA provides written assurance that the Supplier agrees that the product the Supplier designed will meet the Doosan Bobcat Technical Requirements when installed and used in the application environments.

The SAA is mandatory for key components, where the supplier is fully or partially responsible for the product development.

SUPPLIER EARLY PRODUCTION CONTAINMENT

Early Production Containment is a process used to proactively prevent non-conforming product or material from being shipped to Doosan Bobcat factories or subsequently passed on to Doosan Bobcat's customers. A containment plan is established and used during production start-up and acceleration to quickly identify and contain quality issues at the supplier's facility.

Doosan Bobcat may request that the supplier perform a level of inspection in addition to the normal production process, for the first 90 days or 1200 parts (whatever comes first) across a minimum of three (3) set-up changes, produced out of production tooling. Upon completion of this containment plan with no customer reject issues found, the normal production control plan may be implemented. Product subjected to this heightened level of inspection shall be identified and detailed on the Pre-Launch Control Plan and approved by the Doosan Bobcat AQR prior to or at PPAP approval.

SUPPLIER LAUNCH READINESS REVIEWS

Doosan Bobcat may elect to perform a Launch Readiness Review of the supplier's process at the supplier premises prior to Start of Production. Such review will consist of an on-site audit of the production process and quality documents to verify that the actual manufacturing process conforms to the manufacturing and quality plan documented by the supplier in PPAP, Early Production Containment and other required documentation. This review may also include a capacity audit, to verify that the actual manufacturing process is capable of producing components that meet Doosan Bobcat's ongoing quality requirements, at quoted tooling capacity for a specified period of time.

4.4 PRODUCTION PART APPROVAL PROCESS (PPAP)

Suppliers to Doosan Bobcat should use Production Part Approval Process (PPAP) as per AIAG guidelines, following the Doosan Bobcat requirements as established by the AQR to obtain a Full Part Approval.

The purpose of the PPAP is to demonstrate that a supplier is capable of producing parts that meet all design records and specification requirements during an actual production run at the quoted production rate.

Unless a PPAP is requested, suppliers shall submit an Initial Sample Inspection Report (ISIR) with the first shipments for all new parts and revisions including:

- Dimensional Inspection/Layout
- Material & Performance results
- Aesthetics as required

When a PPAP is requested, suppliers are not authorized to begin shipment of production material to Doosan Bobcat prior to Part Approval – PSW sign-off, unless otherwise specified by Doosan Bobcat AQR.

PPAP APPLICATION

A PPAP submission may be required for the following situations prior to the first production shipment:

- New part or product
- New supplier
- Product has been modified by an engineering revision, e.g. an ECN – Engineering Change Notice (section 5.2.1)
- Supplier changes as outlined by the Supplier Product-Process Change Request (SPCR) process (section 5.2.2)
- Production idled for more than 12 months
- Performance issues or concerns (e.g., Re-PPAP)
- Annual requalification/revalidation

PPAP MINIMUM REQUIREMENTS

Depending on the type of risks, Doosan Bobcat AQR will determine the required submission levels necessary to evaluate and qualify parts and will communicate the requirements to the supplier. Modifications of the Submission level may be applied during the APQP reviews based on risk evaluation.

Any PPAP submission from the supplier shall be signed-off by an authorized Quality Authority at supplier.

The supplier shall submit a minimum of (2) sample parts unless otherwise specified by Doosan Bobcat AQR. In the event of multiple processes or tools, part approval will be required for each process or tool, unless otherwise specified.

The following table is a guide for the applicability of the submission levels:

Product Group	Product-Process Characteristics	Submission Level
A	Complex product AND elevated risk inherent in part AND-OR production process AND-OR production location	3, 4 or 5
B	Medium to high complexity products, Doosan Bobcat owned design parts, or parts supplied by active suppliers with proven quality and delivery performance.	2 or 4
C	Simple product; Off-the-shelf part OR catalog item	1 or 4

The supplier can utilize its own PPAP forms in compliance with AIAG standards, or forms can be provided by the Doosan Bobcat AQR.

SUPPLIER PPAP DISPOSITION

Doosan Bobcat AQR will provide one of the following dispositions through PSW Sign-off:

Full Approved (Authorized for Production)	<ul style="list-style-type: none">- All applicable requirements are met.- Samples meet all fit, function, visual, and any reliability test requirements.
Conditionally Approved	<ul style="list-style-type: none">- Samples meet minimum fit, function and reliability requirements.- Temporary corrective actions are in place for all nonconforming dimensions, test result or material specifications have been approved by Doosan Bobcat Design Engineering via Supplier Part/Process Change Request (SPCR).- Supplier must resubmit a PPAP package (including samples) following permanent corrective actions to grant full approval.
Rejected (Not authorized for Production)	<ul style="list-style-type: none">- Samples do not meet minimum fit, function and applicable requirements.- Affected part numbers cannot be shipped for production.- Temporary and / or permanent corrective actions for non-conformances must be implemented to gain either Conditional or Full Part Approval.- Suppliers shall resubmit a PPAP package (including samples) and gain approval from Doosan Bobcat AQR.



V. PRODUCTION REQUIREMENTS

5.1 MANAGEMENT OF DEFECTS (NON-CONFORMITY)

All suppliers shall have a system and adequate personnel in place for the Control & Corrective Action of any non-conforming products identified within the supplier's facility, the Doosan Bobcat manufacturing locations, in transit or in the possession of end customers. The supplier is required to identify and communicate non-conforming parts, address the root cause and to replace any defective parts as quickly as possible, with no significant disruption to production & delivery.

The following requirements apply to any non-conformance found on production parts identified to be the responsibility of the supplier.

SUPPLIER DEFECT REPORT (SDR)

The supplier will be notified of the defects using a non-conforming report generated by the relevant Doosan Bobcat Quality Department and referred to as Supplier Defect Report (SDR) or Non-Conforming Material Report (NCR). For North American and EMEA regions this will largely occur through Global Partner Connect (GPC). Supplier-facing training for this process is included below:

- GPC EMEA SDR Response: <https://www.youtube.com/watch?v=x4l6DingRDE>
- GPC North America SDR response and Auto Debit Process: <https://youtu.be/6vP1s9izgMo>

Please note that our Aftermarket & Attachments business may cite Arrival Condition Reports (ACRs) and/or may generate Non-Conforming Material Reports (NCRs) to communicate the presence & required resolution of non-conforming material.

The supplier is required to take immediate action on the SDR by submitting a formal response before the due date assigned by the Doosan Bobcat AQR. The format used for documenting supplier actions must drive towards root cause analysis, implementation of corrective actions and effectiveness of permanent action to eliminate the problem and recurrence.

The suggested documented problem-solving form is the 8-D Corrective Action report, and is required for all technical non-conformances, unless directed otherwise by the Doosan Bobcat AQR.

D1: Identify team members roles and responsibilities	D5: Identify & Verify Permanent Corrective Action
D2: Define the Problem	D6: Implement Permanent Corrective Action
D3: Implement and Verify interim containment action	D7: Action to prevent recurrence
D4: Identify & Verify Root Cause	D8: Communicate results and recognize team

STEPS TO BE COMPLETED BY THE SUPPLIER WITHIN 24 HOURS:

- Acknowledge receipt of the SDR.
- Establish an immediate containment plan.
- Submit to Doosan Bobcat a rework plan for approval, as applicable.
- Identify and communicate the potential affected population by providing serial numbers, date-batch codes to minimize the exposure of defects to Doosan Bobcat.

STEPS TO BE IMPLEMENTED BY THE SUPPLIER WITHIN 48 HOURS:

- Establish a Corrective Action Team.
- Issue a valid Return Material Authorization (RMA) to Doosan Bobcat for the return of the non-conforming parts.
- Initiate controlled containment at Doosan Bobcat facility, in transit and at supplier facility. If the supplier fails to initiate immediate action and containment, Doosan Bobcat shall be forced to initiate containment at the supplier's expense.
- Identify short-term corrective action plan with timing to replace nonconforming material with certified material that is clearly identified in a manner agreed upon with Doosan Bobcat.
- As requested, approve access to supplier facility by Doosan Bobcat.

STEPS TO BE COMPLETED BY THE SUPPLIER WITHIN 14 DAYS:

(7 days for Safety-critical components or AQR requirements)

- Identify all potential root causes that resulted in the nonconformance issue using tools: Fishbone, 5 Why Analysis, Process FMEAs, and others, and forward this analysis to the Doosan Bobcat AQR as part of the 8D problem solving report.
- Identify and implement permanent corrective actions.

STEPS TO BE COMPLETED BY THE SUPPLIER WITHIN 28 DAYS:

(14 days for Safety-critical components or AQR requirements)

- Complete the 8D with identification and implementation of preventive actions.

If the permanent corrective action requires a process change, the supplier should submit a SPCR as described in Section 5.2.2 hereof.

If the supplier suspects non-conforming parts have been shipped to a Doosan Bobcat manufacturing facility or finds nonconforming parts within the supplier's finished goods inventory, the supplier is required to immediately notify Doosan Bobcat AQR of the problem and initiate the 8D Problem Solving Report.

NOTE:

A SDR will NOT be counted against the Supplier's Performance if the Supplier identifies the issue and initiates the activity for the control and replacement of non-conforming parts at the Doosan Bobcat locations before it is identified or consumed in the Doosan Bobcat production processes.

CONTROLLED CONTAINMENT

General Controlled Containment is a requirement by Doosan Bobcat that specifies that a supplier shall implement a redundant inspection process to sort for a specific non-conformance, while implementing a root-cause problem solving process. In the event of the supplier's Controlled Containment inspection process is ineffective in containing the supplier's quality problem, Doosan Bobcat may choose to utilize a third-party inspection facility in addition to the supplier's Controlled Containment inspection process: this will be at the suppliers expense.

One or several of the following issues may be considered for implementation of Controlled Containment:

- Repeat 8D or Problem-Solving Report Issue
- Current controls are not sufficient to ensure conformance
- Duration, quantity, and-or severity of the problem
- Internal-External Supplier data

- Major Disruptions and or Downtime
- Quality Problem in the field (i.e. Warranty)

The supplier must complete the 8D problem solving report demonstrating permanent corrective action prior to being approved to exit Controlled Containment. Doosan Bobcat will provide written approval to the supplier authorizing it to exit the Controlled Containment activities. This will include the visual identification of certified stock for post-containment shipments.

DEFECTIVE PART COST RECOVERY

It is the supplier's responsibility to provide goods and services that meet all specifications and are delivered on time and in required quantities. The supplier will be held financially responsible if their failure to do so results in loss to Doosan Bobcat or its end customers.

Doosan Bobcat will use Global Partner Connect (GPC) auto debit or customer issued invoices for claiming recovery from the supplier. These processes allow traceability with the SDR and PO. For the Global Partner Connect (GPC) auto debit process, the amount due will be deducted from the next scheduled payment to the supplier. If the recovery invoice process is used, it can be issued if the supplier fails to provide evidence of corrective actions as required in the 8D report no later than 28 days from the SDR notification (sent to the supplier).

Chargeback rates differ within Doosan Bobcat locations and Business Units. Contact your Doosan Bobcat Category/Commodity Representative for applicable rates.

SUPPLIER REWORK ACTIVITIES

Rework consists of alterations to a product that are not part of the basic production process as indicated on the process flow chart and which will provide material in full compliance with applicable drawings and specifications. In case of rework, repair, re-inspection, the supplier shall ensure a risk assessment (such as D-PFMEA) is conducted to evaluate potential quality risks.

When rework is required as an interim measure, the supplier shall provide:

- Identified rework area
- Written rework instructions, rework inspection/test instructions
- Operator training
- Acceptable written standards where applicable, and
- Supplier shall obtain approval by Doosan Bobcat per the Supplier Part/Process Change Request (SPCR) process

All reworked materials must be re-inspected in accordance with the Production Control Plan and identified as reworked. Data must be kept available as per the Records requirements specified in this manual.

Rework on Safety related components or parts are strictly forbidden unless authorized in writing by the AQR through a SPCR.

5.2 CONTROL OF CHANGES (PRODUCT-PROCESS)

NOTIFICATION OF DOOSAN BOBCAT ENGINEERING CHANGES

When a potential change is required, a Request for Quote (RFQ) will be forwarded to the supplier along with a preliminary drawing for review. The subsequent design change costs and timing must be agreed by the supplier and Doosan Bobcat. An Engineering Change Notice will be reviewed, and, if acceptable, released and, once released the supplier will receive formal notice of design changes by a released updated drawing.

Consequently, suppliers should conduct a review and update of their quality assurance system and related documentation such as P-FMEA, Process Flow and Control Plan. Doosan Bobcat will require approval of an updated PPAP prior to implementation of the change.

NOTIFICATION OF SUPPLIER CHANGES IN PRODUCTS, PROCESSES & CONTROLS

The continuous improvement philosophy encourages product-process improvements in quality and efficiency.

The supplier must request and obtain Doosan Bobcat Approval through the Supplier Part-Process Change Request (SPCR) process by notifying the Doosan Bobcat manufacturing location prior to production changes and shipments.

Under no circumstances will the supplier make changes to a production process or part design without proper notification and approval from Doosan Bobcat. Adherence ensures that Doosan Bobcat and its customers' quality is not put at risk through the implementation of changes made outside of Doosan Bobcat's Change Control Process. Failure to comply with the SPCR requirements can result in a New Business Hold and in Doosan Bobcat seeking recovery from the supplier of any-and-all costs associated with the failure to comply, including loss of production. Violation of the Doosan Bobcat Change Control Process can seriously jeopardize the future relationship between Doosan Bobcat and the supplier.

The supplier is required to submit the SPCR to Doosan Bobcat at least 3 months prior to scheduled implementation. If circumstances arise that do not allow for the 3-month notification to be possible, please contact your AQR immediately.

The supplier is required to submit a SPCR for the following situations:

- The addition, modification, or replacement of tooling for a production part.
- Any change-deviation, either temporary or permanent, of a production part relative to design or material.
- Any change in the manufacturing process including product testing, either temporary or permanent, of a production part.
- A manufacturing location change that would include a new geographical location or location change within the plant for a production part (both new and relocated tooling and equipment).
- A sub-supplier source change in materials, component parts or services for production.
- A new, or a change in the, repair-rework procedure of production parts that are intended to be shipped to Doosan Bobcat. A SPCR is applicable any time that a change would cause the supplier to modify the manufacturing process flow chart or control plan for a given production part.

NOTE:

Tooling changes due to normal wear do not apply to the SPCR procedure except for changes that require major rework or an entire replacement of a cavity, mold or assembly fixture.

The supplier will acquire from Doosan Bobcat AQR the feedback regarding the approval-disposition of the SPCR. Depending on the type of change, Doosan Bobcat will require the submission of sample parts and PPAP. When acceptable, the supplier will receive a signed copy of the SPCR from the Doosan Bobcat AQR involved in the review process. With the approved SPCR, the supplier is authorized to implement the change. If rejected, re-submittal of the SPCR will be required for approval prior to the supplier making any changes.

5.3 SUPPLIER PERFORMANCE MANAGEMENT

The purpose of the Supplier Scorecard process is to monitor, classify and communicate the performance of all direct material suppliers. These measures are regularly reviewed to track supplier performance, providing valuable data to Doosan Bobcat Sourcing decisions. The scorecard is updated & published monthly and available upon request through your Doosan Bobcat AQR if you are not already receiving via e-mail. The Doosan Bobcat Category/Commodity Representative may review Scorecard results on regularly scheduled business reviews.

Suppliers are expected to use this information to help identify opportunities for continuous improvement in the areas of quality, warranty, and delivery. The Supplier Performance is monitored based on the following key performance indicators and preferred level scorings:

Category	KPI	Best in Class scoring (Level 1)
QUALITY	Parts Per Million Defective (PPM)	≤ 300
	Severity	< 25
	COPQ as % of spend	< 0.75%
DELIVERY	On Time Delivery (OTD)	≥ 95%



5.4 APPROVED SUPPLIER LIST

As an integral part of Supplier Management, classification of suppliers enables Doosan Bobcat Sourcing to prioritize resource allocation towards Supplier Improvement or Development, Supplier recognition, new business allocations, etc.

Suppliers are classified as follows:

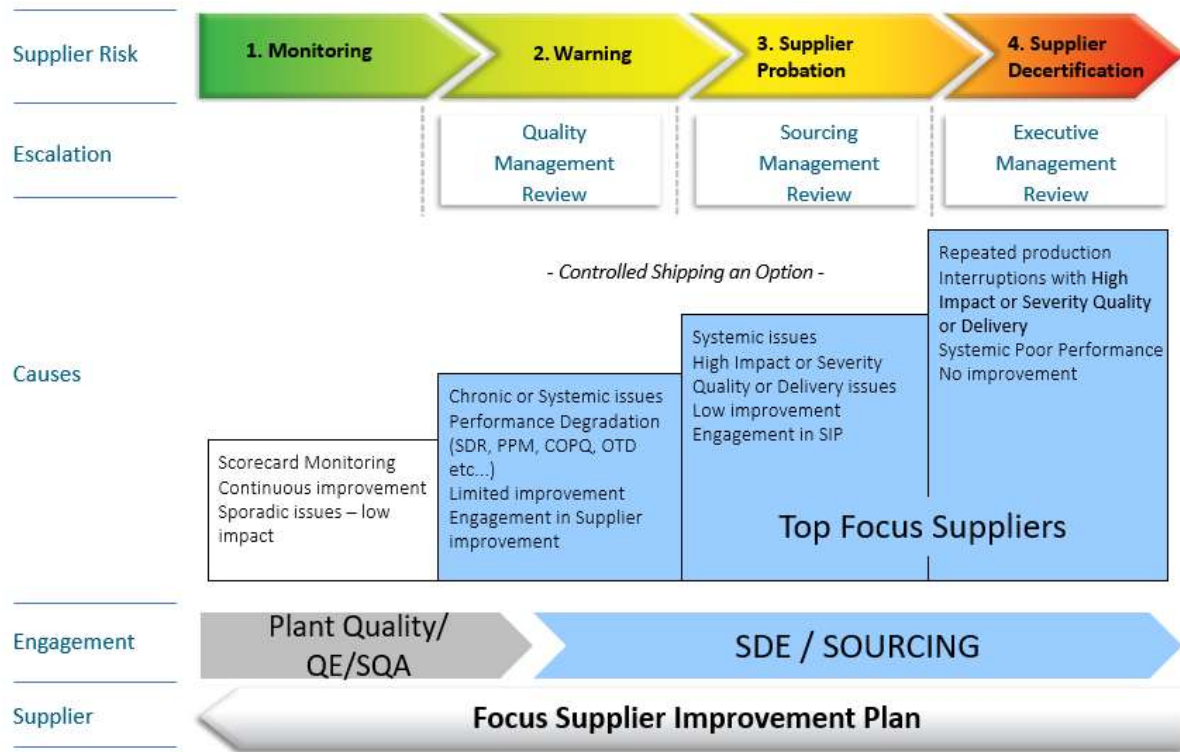
DGSS Level 1	Approved/Grow (Develop Strategic Relationship)	Supplier is eligible to be recommended for all new business.	<ul style="list-style-type: none"> Exhibit consistently high, sustained values on performance soundness; financial soundness. Shared business objectives with executive dialogue: joint pursuit of critical business opportunities and/or product development. Critical source of supply and a formal long-term agreement.
DGSS Level 2	Approved/Maintain (Performance Improvement)		<ul style="list-style-type: none"> Exhibit many, but not all, characteristics of a strategic supplier. Requiring some improvements on performance scorecard such as quality, warranty, productivity, cost, delivery and service.
DGSS Level 3	Maintain/NBH (Risk of New Business Hold)	Supplier can be considered for ongoing relationships. Opportunity to be awarded new business can be denied.	<ul style="list-style-type: none"> Can result in the supplier being put on probationary status. Continuous improvement plan for quality, warranty, productivity, cost, delivery, and service is required by the supplier and must be approved by Doosan Bobcat. No improvement over time could lead to a long-term exit strategy.
DGSS Level 4	New Business Hold/Exit	Suppliers exhibit unsatisfactory performance.	<ul style="list-style-type: none"> Unsatisfactory quality, service, price or technology. Suppliers are denied new business opportunities. No new business/orders should be assigned. This level leads to phase-out of the supplier.



5.5 ESCALATION OF POOR PERFORMING SUPPLIERS

Doosan Bobcat will operate an escalation process for poor performing suppliers. It consists of Quality and Sourcing management reviews with the supplier if the supplier's performance is not improving and the poor performance is impacting the business of Doosan Bobcat.

The following chart describes this escalation process:



5.6 RISK MANAGEMENT AND BUSINESS CONTINUITY GUIDELINES

Doosan Bobcat's supply chain has become increasingly complex, global, and subject to a variety of risks that could jeopardize continued operations and impact our commitment to on-time fulfillment and efficiency to satisfy our customers. In this environment, we are challenged every day to minimize risk by establishing Business Continuity Plans within our supply chain. Therefore, Doosan Bobcat expects its suppliers to establish Risk Management and Business Continuity Plans.

While it is clear contingency plans cannot be developed for all potential scenarios, we expect our suppliers to take basic steps that will facilitate quick reaction in the event of disruptions.

Doosan Bobcat expects its suppliers to have a comprehensive crisis management plan to deal with potential disruptions. The plan should include a plan of action, checklist of activities, communication plans, escalation procedures, and organization with teams, roles, and responsibilities. Upon request by Doosan Bobcat, the supplier must provide evidence of risk management and business continuity plans.

At a minimum, the following disruptions must be planned for:

- Specialty equipment failures
- Event-based risks such as fires, chemical spills, natural disasters, terrorist threats, medical emergencies, and HR (example: strikes)
- Risks in sub-suppliers' and sub-contractors' Supply Chain Continuity
- Trade & Regulatory Non-Compliance (example: Global import-export requirements and trade agreements)
- Pandemics Preparedness Plan (example: COVID-19, Avian Flu Pandemic)
- IT Disaster Recovery and IT Security for supplier telecommunications, data, systems and infrastructure
- Financial and Regulatory Non-Compliance
- Confidentiality Policy (including protection of Doosan Bobcat Intellectual Property)

The supplier must notify Doosan Bobcat of any identified risk requiring a contingency action that may affect business continuity: notification is expected to be within 24 hours of the occurrence. Doosan Bobcat will notify suppliers when identified as part of a risk situation.

SUPPLIER RISK MANAGEMENT – FINANCIALS

Doosan Bobcat Global Sourcing's primary responsibility is to make sure an uninterrupted supply of high-quality goods and services are delivered to the proper place and at the proper time. Therefore, Doosan Bobcat believes that its suppliers must be both operationally and financially strong to be successful. To evaluate risks, Doosan Bobcat may require suppliers to assess their financial data on a yearly basis or greater frequency, based on ratings. To provide highest integrity and confidentiality in the evaluation of supplier financial data, Doosan Bobcat may use third party leading financial advisory firms.

Suppliers are required to comply with the request for financial data to be provided to Doosan Bobcat or its advisory firm in a prompt manner to ensure financial rating is available to Doosan Bobcat Global Sourcing as a performance indicator for building and maintaining strong relationships and businesses.



VI. CONTINUOUS IMPROVEMENT

Suppliers are expected to demonstrate a commitment to Continuous Improvement in products and processes provided to Doosan Bobcat by emphasizing value creation, and defect & cost reduction. Doosan Bobcat is committed to assisting its suppliers in developing and implementing quality improvement activities.

The Supplier Development group is the extension of the Doosan Bobcat Total Quality Management system that supports our suppliers in the deployment of Lean Six Sigma and assists in driving their improvement efforts by focusing on:

Improving:	Reducing:
Process Control	Quality Defects
Quality Systems	Delivery Variation
Productivity	Costs
Capacity	Lead Time
Optimizing:	Training:
Supply Chain Effectiveness	Supplier Personnel



The selection of suppliers for development opportunities are defined based on criteria such as (but not limited to):

- ✓ Strategic growth suppliers
- ✓ Critical parts
- ✓ Risk revenue partner
- ✓ Increased capacity needs
- ✓ Performance issues

The following steps are required to initiate and perform continuous improvement and development activities with a supplier:

- 1) Management involvement and business group sponsorship
- 2) Cross-functional teaming
- 3) Project Selection
- 4) Situation Analysis
- 5) Communicating and training on Lean and/or Six Sigma
- 6) Project Management Implementation
- 7) Analysis of Benefits

VII. SUPPLIER RELATIONSHIP MANAGEMENT

In the pursuit of enhancing Supplier Relationship Management (SRM) through increased visibility and real-time access to information, eliminating the need for faxing or emailing transactional data, suppliers must register with the web-based systems enabled by Doosan Bobcat. Once registered, the supplier will be provided with a user name and password to connect to the supplier portal and shall be required to comply with the requirements for the use of the supplier portal and regularly verify available information.

Benefits of using the web-based applications include but are not limited to:

- Ability to quickly provide specific information to supplier
- Increased visibility for the Sourcing personnel of Doosan Bobcat
- Quick review of part-product activities
- Access to online quality tools for:
 - Supplier Performance Management
 - Defect Management (defect reporting and RCCA)
 - SPCR: deviation and change request and tracking
- Visibility of Procurement transactional information:
 - Purchase orders, invoicing
 - Inventory levels
 - Schedules and Forecasts
- Access to Doosan Bobcat Engineering Standards.

The following table provides the Internet web addresses of the current supplier portals available within Doosan Bobcat:

Ref.	SRM System	Supplier Portal weblink
A	Global Partner Connect (GPC)	https://erpportal.doosan.com/OA_HTML/AppsLocalLogin.jsp

Please note that only limited Doosan Bobcat affiliates are operating the current Supplier Portals. Therefore, references to the SRM system are made in Section VIII for comprehensive application of the portals.

The Suppliers shall be compliant with the applicable SRM online tools to the Doosan Bobcat region or manufacturing locations they are providing direct products/parts or services.

It is the responsibility of the Supplier to contact their Doosan Bobcat Sourcing or AQR to gain full understanding of the available online tools.



VIII. SCOPE OF APPLICATION

DOOSAN BOBCAT GLOBAL OPERATIONS FACILITIES, ADDRESSES, AND CONTACT NUMBERS

HEADQUARTERS

Location	Address	Phone number	Supplier Portal
Doosan Bobcat Inc.	155, Jeongjail-ro, Bundang-gu, Seongnam-si, Gyeonggi-do, South Korea	+ 82 31 5179 3300	

EUROPE MIDDLE EAST AFRICA

Location	Address	Phone number	Supplier Portal
Doosan Bobcat EMEA HQ	U Kodetky 1810 Dobris CZ26312 Czech Republic	+42 0 318 532 258	A
Doosan Bobcat Manufacturing s.r.o	U Kodetky 1810 Dobris CZ26312 Czech Republic	+420318532258	A
Doosan Bobcat Engineering s.r.o			
Bobcat France	Rue de Nantes, 44160 Pontchâteau France	+33240007375	A
DIPP Air Power	Air Power, s.r.o. Tylova 1/57, Hala 1.5.1.3 Hlavni Areal Skoda, Plzen 30100 Czechia	+420 724035914	
Geith International Limited	Block B, Swords Business Campus Swords Co Dublin Ireland	+35 316502100	

ASIA / LATIN AMERICA

Location	Address	Phone number	Supplier Portal
Doosan Bobcat China co., Ltd.	No. 68, Suhong East Rd., Suzhou Industrial Park, Jiangsu, 215026 China	+86 0512 8777 7569	

INDIA

Location	Address	Phone number	Supplier Portal
Doosan Bobcat India Pvt. Ltd.	A No 61 NH-5 Near Sharon Ply Wood Gummidipoondi Taluk, Thiruvallur Dist, Chinna Obulapuram, Tamilnadu – 601201, India	+91 080 68077520	
Doosan Bobcat India Private Ltd.	HTC Towers, 6th Floor, 41, GST Road, Guindy, Chennai - 600 032, Tamilnadu, India	+9108068442225	

NORTH AMERICA

Location	Address	Phone number	Supplier Portal
Doosan Bobcat Company NA HQ	250 East Beaton Drive PO Box 6000 West Fargo, ND 58078-6000, USA	+1 701 241 8700	A
Doosan Bobcat Company, Gwinner	210 1st Ave NE PO Box 128 Gwinner, ND 58040, USA	+1 701 678 6363	A
Doosan Bobcat Company, Bismarck	521 South 22nd Street Bismarck, ND 58504, USA	+1 701 222 5000	A
Doosan Bobcat Company, Wahpeton	2101 11th St N Wahpeton, ND 58075, USA	+1 701 451 7003	A
Doosan Bobcat Company, Litchfield	520 Polydome Dr Litchfield, MN 55355, USA	+1 320 693 4960	A
Doosan Infracore Portable Power	1293 Glenway Drive Statesville, North Carolina, 28625, USA	+1 704 883 3586	A
Doosan Bobcat Johnson Creek Manufacturing Facility	One Bobcat Lane Johnson Creek, WI 53038	+1 920 669 2000	A
Doosan Bobcat Company, Rogers	19850 S Diamond Lake Rd Ste 120, Rogers, MN	-	A



IX. APPENDIX

9.1 GLOSSARY & DEFINITIONS

8-D	8 Disciplines An 8-Step Corrective Action Process and reporting format.
IATF 16949	IATF 16949:2016 is a technical specification aimed at the development of a quality management system which provides for continual improvement, emphasizing defect prevention and the reduction of variation and waste in the automotive industry supply chain and assembly process. It is based on the ISO 9001 standard.
ISO9001	The ISO 9000 family of standards is related to quality management systems and designed to help organizations ensure that they meet the needs of customers and other stakeholders while meeting statutory and regulatory requirements related to the product.
ISO14000	ISO 14000 is a family of standards related to environmental management that exists to help organizations (a) minimize how their operations (processes etc.) negatively affect the environment (i.e. cause adverse changes to air, water, or land); (b) comply with applicable laws, regulations, and other environmentally oriented requirements, and (c) continually improve in the above.
OHSAS 18000	OHSAS 18000 is an international occupational health and safety management system specification developed by the London-based BSI Group. OHSAS 18000 is the internationally recognized assessment specification for occupational health and safety management systems
ISO 17025	General requirements for the competence of testing and calibration laboratories
AAR	Appearance Approval Report A report to request the approval of the physical color, grain or finish appearance of the part.
ACR	Arrival Condition Report May be used by drop-ship receiving locations to indicate the as-received condition of materials/product.
AIAG	Automotive Industry Action Group A not-for profit association originally created to develop recommendations and a framework for the improvement of quality in the North American Automotive Industry.
APQP	Advanced Product Quality Planning A process to produce a product quality plan which will support development of a product or service that will satisfy the customer. APQP specifies three phases: Development, Industrialization and Product Launch.
AQR	Authorized Quality Representative A Doosan Bobcat representative who shall be the key contact of the supplier. This individual may be from Quality Assurance, Supplier Development, or Sourcing Departments.
ASL	Approved Supplier List The internal list of suppliers approved for production that can be sourced for existing and new components.
Boundary samples	Boundary samples identify the min and max acceptable conditions as outlined by the boundary sample.
BSIC	Bobcat Supplier Information Center (suppliers.bobcat.com) The Supplier Portal used for Supplier Relationship Management.
CCM	Critical Characteristics Matrix A matrix combines the identified Critical Characteristics that have been determined by both the supplier and Doosan Bobcat within a table that shows the linkage between DFMEA, PFMEA, and Control Plan.
Checking Aids	A device used to verify the dimensional accuracy of a part
COPQ	Cost of Quality-Cost of Poor Quality A methodology for capturing costs related to Quality due to Prevention, Appraisal, and Failures.
CP	(Production) Control Plan A description of the systems for controlling parts and processes. The control plan is a living document to be updated with the addition/deletion of controls based on experience gained by producing parts.

Cp, Cpk Pp, Ppk	<p>Process Capability Index (assumes process output is approximately normally distributed) Process Performance Index</p> <p>Cp, Pp: Estimates what the process is capable of producing if the process mean were to be centered between the specification limits.</p> <p>Cpk, Ppk: Estimates what the process is capable of producing, considering that the process mean may not be centered between the specification limits.</p>
CTQ	<p>Critical to Quality (Characteristics)</p> <p>The identification of a characteristic critical to the Quality of the product. This may be related to fit, function, and safety.</p>
DFMEA	<p>Design Failure Mode and Effects Analysis</p> <p>A disciplined review and analysis of a new/revised design and is conducted to anticipate, resolve, or monitor potential design problems for a new/revised product.</p>
DGSS	<p>Doosan Global Sourcing System</p> <p>The global manual of internal procedures and policies applicable to Sourcing activities within Doosan Bobcat.</p>
ECN	<p>Engineering Change Notice</p> <p>A formal communication process to inform and approve a product change to be implemented</p>
EDI	<p>Electronic Data Interchange</p> <p>The structured transmission of data between organizations by electronic means. It is used to transfer electronic documents or business data from one computer system to another computer system.</p>
EPC	<p>Early Production Containment</p> <p>Containment in place to ensure no quality defects will be passed on to the customer.</p>
FIFO	<p>First-In First-Out</p> <p>An abstraction related to organizing and manipulating of parts based on time and prioritization</p>
Gage R&R	<p>Gage Repeatability and Reproducibility</p> <p>A statistical study to determine repeatability and reproducibility by measuring a part's characteristic</p>
GPC	<p>Global Partner Connect</p> <p>Doosan Bobcat supplier portal. Multiple uses, to include processing of SDRs and SPCRs, auto-debit for nonconforming material.</p>
ISIR	<p>Initial Sample Inspection Report</p> <p>A record of dimensions or specifications shown by a unique number on a copy of the drawing</p>
LRR	<p>Launch Readiness Review</p> <p>A process audit and production trial run to be performed at the supplier's location to verify the supplier's readiness to start production for the part to be supplied to Doosan Bobcat.</p>
Material Performance Results	<p>Test specification, acceptable tolerance, and actual value of the material data. Material compliance certificate only will not be accepted.</p>
MSA	<p>Measurement System Analysis</p> <p>Critical evaluation for the measurement equipment to be used for the production, testing, and verification of the production parts. Among other methods, this study includes Gage R&R studies for the measurement equipment to be used.</p>
NBH	<p>New Business Hold</p> <p>A probationary status forbidding the award of new business to a supplier.</p>
NCR	<p>Non-Conforming Report</p> <p>A formal document established by a customer location reporting found non-conforming parts. Same as the Supplier Defect Report</p>
NPD	<p>New Product Development</p> <p>This refers to the process for New Product Development within Doosan Bobcat</p>
OSA	<p>On-Site Assessment</p> <p>An audit of the supplier company performed at supplier premises.</p>
OTD	<p>On Time Delivery</p> <p>A Key Performance Indicator of the Service level from a supplier. It is a measure of the parts delivered on time to Doosan Bobcat locations.</p>

PFD	<p>Process Flow Diagram</p> <p>The process flow diagram is a schematic representation of the current or proposed process flow. It shall clearly describe the steps and sequence of the production process.</p>
PFMEA	<p>Process Failure Mode and Effects Analysis</p> <p>A disciplined review and analysis of a new/revised process and is conducted to anticipate, resolve, or monitor potential process problems for a new/revised product.</p>
PPAP	<p>Product Part Approval Process</p> <p>The process for approving the product and manufacturing process of the supplier for start of production. The PPAP process is designed to demonstrate that the component supplier has developed their design and production process to meet the client's requirements, minimizing the risk of failure by effective use of APQP. Requests for part approval must therefore be supported by PPAP.</p>
PPM	<p>Parts Per Million</p> <p>A Key Performance indicator of the quantity of the defective parts measured per million.</p>
PSW	<p>Part Submission Warrant</p> <p>Form to request for part approval as part of the PPAP package.</p>
RFI/RFQ	<p>Request for Information-Quote</p> <p>The formal process to request suppliers to provide quotations on Doosan Bobcat requirements.</p>
RMA	<p>Returned Materials Authorization</p> <p>A formal approval from the supplier to return defective material found in Bobcat locations.</p>
RCCA	<p>Root Cause Corrective Action</p> <p>The cause of a nonconformity that, with effective implementation of corrective action, fixes the identified concern. Once the problem can be turned on and off, the root cause has effectively been found. Corrective Action taken on the process eliminates a detected non-conformity or non-desirable situation from recurring. Corrective action prevents recurrence. It is reactive rather than proactive.</p>
SAA	<p>Supplier Application Approval</p>
SCAR	<p>Supplier Corrective Action Request</p> <p>A request for the supplier to undertake root cause analysis and corrective actions on quality issues.</p>
SDR	<p>Supplier Defect Report</p> <p>A formal report to a supplier about a quality issue, supporting a corrective action request.</p>
SFR	<p>Supplier Feasibility Review</p> <p>A workshop where the feasibility of a new component is studied and approved by the supplier to be able to manufacture as per the definition.</p>
Shall/Should	<p>SHALL = Mandatory Requirement</p> <p>SHOULD = Recommendation</p>
SOP	<p>Start of Production</p>
SPC	<p>Start of Production Statistical Process Control</p> <p>A method of quality control which uses statistical methods. SPC is applied in order to monitor and control a process.</p>
SPCR	<p>Supplier Part-Process Change Request</p> <p>A documented supplier request used to make any changes to a supplier's tooling, manufacturing process, manufacturing location, or sub-supplier.</p>
SQE/SDE	<p>Supplier Quality Engineer - Supplier Development Engineer</p>
SRM	<p>Supplier Relationship Management</p> <p>A discipline of strategically planning for, and managing, all interactions with third party organizations that supply goods and/or services to an organization to maximize the value of those interactions. In practice, SRM entails creating closer, more collaborative relationships with key suppliers to uncover and realize new value and reduce risk.</p>
TQM	<p>Total Quality Management</p> <p>An integrative philosophy of management for continuously improving the quality of products and processes. The quality of products and processes is the responsibility of everyone who is involved with the creation or consumption of the products or services offered by an organization. In other words, TQM capitalizes on the involvement of management, workforce, suppliers, and even customers, to meet or exceed customer expectations.</p>

TPM	Total Productive Maintenance A method for improved machine availability through better utilization of maintenance and production resources. TPM is a proactive approach that essentially aims to identify issues as soon as possible and plan to prevent any issues before occurrence.
VA / VE	Value Analysis-Value Engineering A systematic method to improve the "value" of goods or products and services by using an examination of function. Value, as defined, is the ratio of function to cost.

X. REVISION HISTORY

Date	Rev.	Approver	Changes	Description
2012.09.01	01A	M.Balzano	/	Initial Release
2012.10.15	01B	M.Balzano	Missing text & corrections	- SFR added on page 16 - word corrected on page 15 - DISC address corrected on page 29
2018.07.12	02A	N.Gerhardt	Update document	- Changed all references from DICE to Doosan Bobcat - Added reference to "Code of Conduct" in 2.19 - Updated KPI table in 5.3 - Updated site locations on page 28
2021.08.17	03A	M. Rebilas	Update document	Per file "2021 Global Supplier Quality Manual Updates"
2022.10.12	04A	M. Rebilas	Update document	Per file "2022 Global Supplier Quality Manual Updates"





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