Key Product Characteristic Designation and Management System

PWI 04.02.06

Revision 5

Final Approval: Ron Panek **Date:** 05Jul18

Purpose and Scope: This standard outlines requirements for how to control potential risks related to product and process through the identification and management of Key Product Characteristics (KPC's)

The purpose of this standard is to facilitate and harmonize the use of Key Product Characteristics on drawings and Process Control Plans throughout Lisk and its supply chain. It explains the designation of Key Product Characteristics to fulfill functional and regulatory requirements.

All Lisk product lines, sites and external suppliers referred to within this procedure must adhere to this standard.

Document Owner: Pat Pendell

Definitions:

Characteristics: dimensions or physical, chemical, electrical, mechanical or visual properties. A characteristic must be measureable either as a variable or attribute.

Standard Product Characteristics: features where variation within tolerance will have no significant impact on Safety and/or Environmental Regulation, Customer Interface, Performance/Function, Cosmetics or Customer-mandated 100% detection. These characteristics have no special identifications on drawings.

Key Product Characteristics (KPC's): features of a material, process, or part (includes assemblies) whose variation within the specified tolerance has a significant influence on Safety and/or Environmental Regulation, Customer Interface, Performance/Function, Cosmetics or Customer-mandated 100% detection.

Personnel:

Product Line Engineering Manager: responsible for ensuring that this standard is followed, monitored and observed during the NPDP process.

Project Engineer: responsible for identifying the Key Product Characteristics on all drawings for projects governed by the NPDP process.

Quality Manager: responsible for ensuring that requirements defined in this standard are implemented.
Supplier Quality Engineering Manager: responsible for communicating this standard and enforcing its compliance within the supply chain.

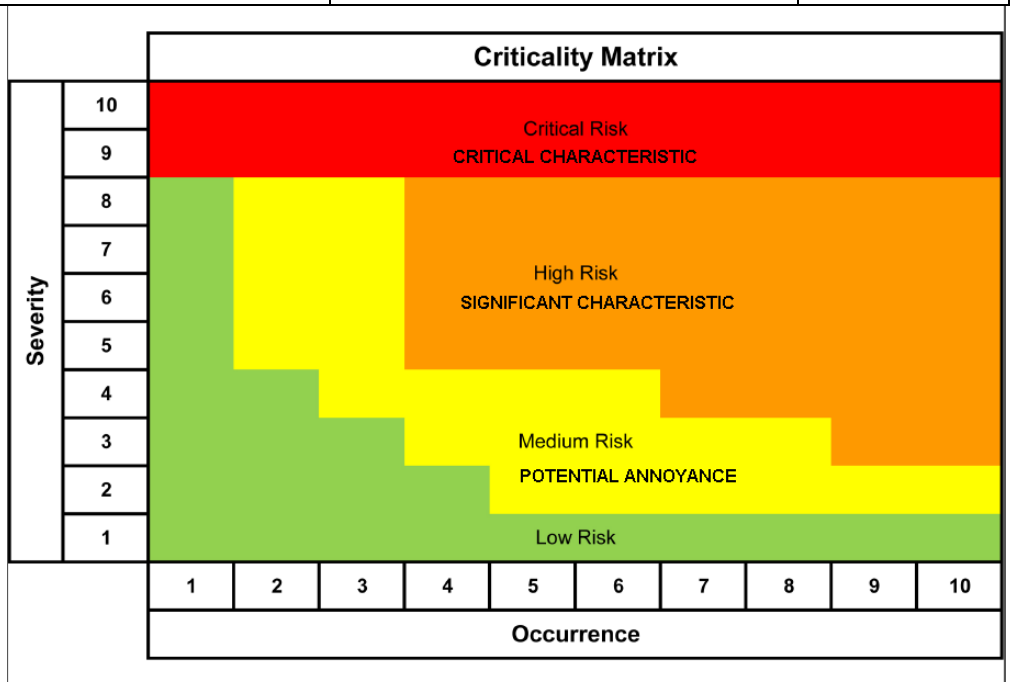
Procedure:

1.1 Determination and Control of Key Product Characteristics

Suggested Methods for Key Product Characteristic Identification

Table 1: KPC Selection and Designation

Source of KPC	Criteria	Control Code
DFMEA	Severity > 8 **(ZONE 1)**	1 - 4
Customer interface and/or performance requirements	Specified on customer top level drawing	5
Environmental regulations	Specified by customer; acknowledged by Lisk during Stage 1: Scope	1
Similar to prior product design	Same as prior design	1 - 4
DOE - Design of Experiments/Design Optimization Studies		3



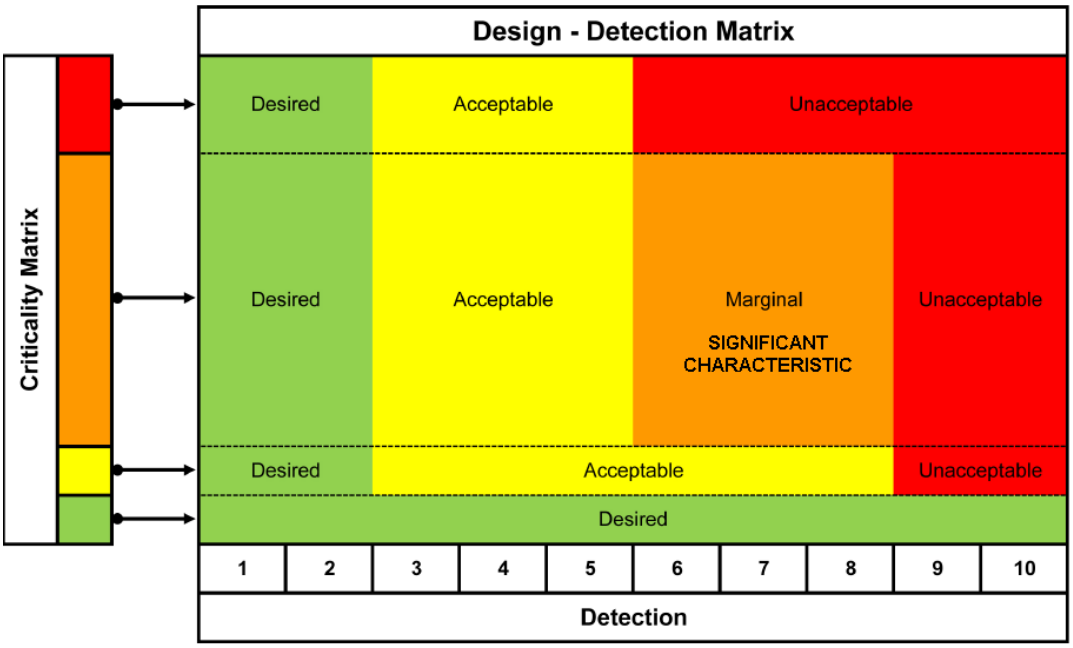


Table 2: KPC Control Matrix

Control Code	Reason	KPC Requirements		
		Prototype/development	**PPAP**	**Serial production**
1	Safety and/or environmental regulation	100% inspection/measurement	Cpk > 1.67 on-going or *	Cpk>1.67 on-going or *
2	Customer interface	100% inspection/measurement	Cpk > 1.33 on-going or *	Cpk>1.33 on-going or *
3	Performance/function	100% inspection/measurement	Cpk > 1.33 1-time snapshot or *	Cpk>1.33 on-going or *
4	Cosmetic	100% inspection/measurement	Cpk > 1.33 1-time snapshot or *	C of C
5	Customer mandated 100% inspection/measurement	100% inspection/measurement	100% inspection/measurement	100% inspection/ measurement

Additional Applicable Requirements:

- * = optional 100% inspection/measurement or poka-yoke. Some measures may be deemed impractical due to time, cost or destructive technique to establish a Cpk as designated above. In these cases a correlation of KPC feature achievement to manufacturing process control parameter ranges should be established. The KPC requirement for control then is monitoring the process control parameter to stay within those ranges.
- If the KPC applies to a material, Certificate of Conformance required.
- On-going statistical control as evidenced by Xbar and R charting methodology.
- 1 time snapshot statistical control as evidenced by required Cpk of 30 pc min sample size.
- During Prototype/Development phase, measurement of 30 pcs maximum is acceptable only if the Cpk meets the PPAP column requirements in Table 2.
- Serialization of samples is not required.

KPC Designation based on Feedback

- Changes to candidate KPCs may originate during a design review (PWI 04.01.01) or based on manufacturing and customer experience.
- Changes to Customer Mandated changes must start with the Quality engineer submitting a customer change request.
- If a change to a KPC is desired based on a design review or manufacturing assessment, the change may be executed using the change request procedure (PWI 04.02.04)

1.2 Documentation of Key Product Characteristics

- Reference example drawing in appendix for typical layout.
- KPC's will be marked on drawing according to the Lisk drafting standard. The appropriate symbol defined below will be placed adjacent to the dimension or specification associated with the Key Product Characteristic.
- A table of Key Product Characteristic features and their related identification, reason and control codes will be applied to the drawing. Reference sample in Appendix.
- Each KPC on a drawing will be marked per below:
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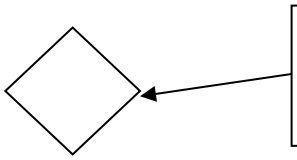
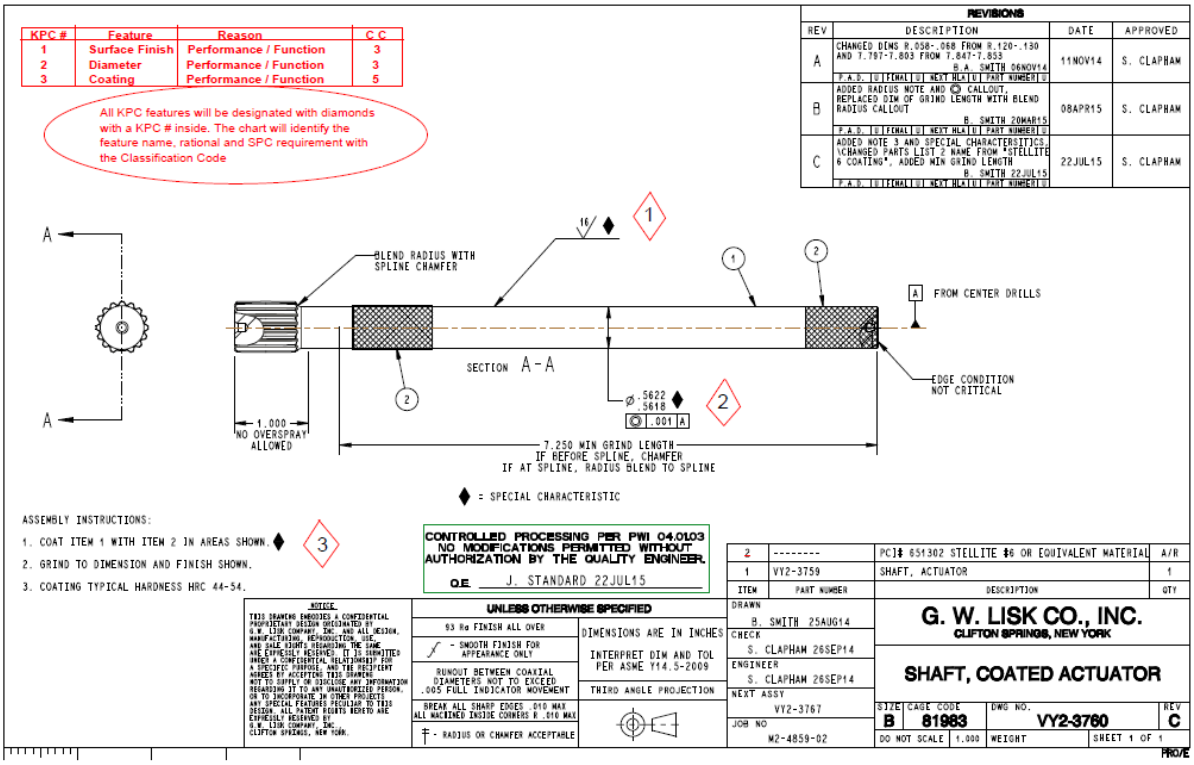


KPC Identification Number shown in table on drawing with related Feature Type, Reason and Control Code (reference example in Appendix)

2.0 Appendixes



3.0 Flowdown:

- KPC's including any safety features should have the same symbols noted above; must flow down to FMEA, control plans, and work instructions. Applies to both internal and external suppliers. Customer symbols if required will be used. Doc 02 08 shows examples of known customer symbols and symbols used on legacy drawings (released before 26Apr16). Legacy drawings may be updated to comply with this procedure at the discretion of the Project Engineer. If a conversion table is sent to the customer, Doc 02-08 shall be updated.
- Control Strategies are noted in QP 20.01 statistical methods.
- Monitoring Strategies are noted in QP 02.04 Continuous Improvement
- If customer approval of special characteristics is required then PWI 04.01.03 Controlled Processing may be required and the requirements noted in that procedure shall be followed

Revision History:

CR#526, Rev5, 14Jun18: The footnotes to table 2 now indicate the treatment required for a KPC theat can't be measured or is impractical to measure.

CR#437, Rev4, 01May18: Add to section 3.0: and symbols used on legacy drawings (released before 26Apr16). Legacy drawings may be updated to comply with this procedure at the discretion of the Project Engineer.

CR#330, Rev3, 01Mar18: Add section for flowdown