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Design FMEA

Key Point(s):

- The Design FMEA is an analytical technique used by a cross-functional team to ensure that all potential failure modes and their associated causes have been identified and actioned. Complete assemblies, along with every related system, subassembly and component shall be evaluated.
- The Design FMEA does not rely on process controls to overcome potential design weaknesses, but it does take the technical/physical limits of the manufacturing/assembly process into consideration, for example;
  - Necessary mould drafts
  - Limited surface finish
  - Assembling space / access for tooling
  - Limited hardenability of steels
  - Tolerance / process capability / performance
- The Design FMEA can also take into consideration the technical / physical limits of product maintenance (service) and recycling, for example;
  - Tool access
  - Diagnostic capability
  - Material classification symbols (for recycling)
- When developing countermeasure actions for potential failure modes, the supplier shall ensure that the feasibility of each countermeasure from a manufacturing perspective is analysed before implementing the action.
- The supplier shall ensure consistency throughout all documentation (e.g.: Control plan, Process Flow Chart , Special Characteristic and Key Features Diagram, Inspection Report, FMEA) for:
  - Operation step numbering
  - Product characteristics identification

Minimum Content Requirement(s):

- Unless otherwise specific request from Nissan, the supplier can use own standard or automotive industrial guideline for FMEA of AIAG (Automotive Industrial Action Group) and VDA (Verband der Automobilindustrie e.V.).

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Output Document Description:

Item	Completion Instructions
Project	The Nissan Vehicle/Power train project for which the product is being developed/manufactured.
Special Characteristic	Tick all boxes that apply to the product being developed / manufactured.
Document Reference No./Version	The suppliers reference No. and version No. for the document.
Document Revision Date	The date of the latest revision of the document.
Document Origin Date	The date when the document was first issued.
Supplier Name	The supplier name.
Supplier Plant	The location at which the product will be manufactured.
Supplier Code	A unique code to each supplier, issued by Nissan purchasing department.
Author	The name of the person who created/revised the document.
e-mail	The e-mail address of the person who created/revised the document.
Tel	The telephone number of the person who created/revised the document.
Part Name	The part name or description as identified on the product drawing.
Part No.	The part No. and issue level as issued by Nissan design department.
Design Note No.	The latest design note number that applies to the product being developed/manufactured.
Item/Function	● This shall include all assemblies, sub-assemblies and components down to basic component part level (e.g. Bolt, Gasket, etc.). ● Describe as accurately as possible the function of each item. ● Where the item has multiple functions, each function shall be evaluated separately without omission.
Potential Failure Mode	Anticipate and describe all possible ways the part could fail, not how it will fail. When describing the failure mode, avoid using non-specific terms such as “damage” etc.
Potential Effect(s) of Failure	The supplier shall contact Nissan in order to fully understand the functional relationship between the item being analysed and other vehicle parts/ systems. The effect(s) of the failure on these functional relationships must be considered.
Potential Cause(s)/Mechanism(s) of Failure	List every potential cause and/or failure mechanism for each failure mode.

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Recommended Actions		Study and describe the Recommended Actions from the point of view of Design revision/Design Validation / Design Verification according to the result of Risk Priority Number (RPN) assessment. Recommended Actions such as, but not limited to, the following should be considered; ● Revised design geometry and / or Tolerances ● Revised material specification, ● Design of experiments, Revised test plan (Design Verification and Product / Process Validation)
Responsibility & Target Completion Date		
Action Result	Action Taken	

Note(s):

- The supplier shall take into account the specific regulation requirements that shall be applied in each country of sales defined by Nissan.

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