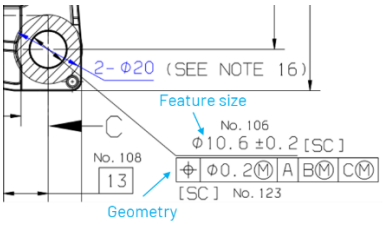
QPD 052 A - [CC]/[SC] summary

		[CC]	[SC]
1	When applied (see §5 for definition of [CC] & [SC].	May affect a product safety, operator safety and/or compliance with regulatory (governmental and legal) requirements.	May affect a product form, fit or function significantly (other than safety and regulatory) or has other valid reasons for control and documentation.
2	Is a deviation approval possible from the characteristic specified on the drawing?	Yes, temporarily (see PPAP manual)	Yes, temporarily (see PPAP manual)
3	Evidence for new design and new tool		
3.1	Evidence for PPAP approval	Initial capability Ppk ≥ 2.0 OR ANY or ALL OF other methods more appropriate for certain processes or products may be used with prior approval from the responsible Design Authority: • Poka-Yoke • 100% automatic detection of defects • Certification in case of Homologation, DOT approval, CE approval, Flammability acc. FMVSS 302, Material Certificate, VDA or other customer special characteristic certification requirements etc. ... Reduced capability level shall be defined for specific cases by responsible Design Authority based on overall safety margin analysis. The respective capability level has to be documented on the Drawing.	Initial capability Ppk > 1.67 OR ANY or ALL OF other methods more appropriate for certain processes or products may be used with prior approval from the responsible Design Authority: • Poka-Yoke • 100% automatic detection of defects • Certification in case of Homologation, DOT approval, CE approval, Flammability acc. FMVSS 302, Material Certificate, VDA or other customer special characteristic certification requirements etc. ... Reduced capability level shall be defined for specific cases by responsible Design Authority based on overall safety margin analysis. The respective capability level has to be documented on the Drawing. ***Note:*** *For geometric features that are identified as an [SC] characteristics (as shown in the example GD&T Reference Control feature below) with a MMC or LMC modifier, use the Ppk formula to generate the capability indice to determine if the supplier process is meeting Veoneer requirements.*  For a feature of size (hole with Ⓜ or shaft with Ⓛ) use the following: $$Ppk = \frac{USL_G + (\bar{X}_S - LSL_S) - \bar{X}_G}{3 * \sqrt{{\sigma_S}^2 + {\sigma_G}^2}}$$ For a feature of size (hole with Ⓛ or shaft with Ⓜ) use the following: $$Ppk = \frac{USL_G + (USL_s - \bar{X}_S) - \bar{X}_G}{3 * \sqrt{{\sigma_S}^2 + {\sigma_G}^2}}$$

Bonus Tolerance Calculation

			$\bar{X}_G = average\ geometric\ deviation$ $\bar{X}_S = average\ feature\ size$ $\sigma_G = standard\ deviation\ of\ geometric$ feature $\sigma_S = standard\ deviation\ of\ feature\ of\ size$ $LSL_S = lower\ spec\ limit\ of\ feature\ of\ size$ $USL_G = upper\ spec\ limit\ of\ geometric\ tolerance$ $USL_S = upper\ spec\ limit\ of\ feature\ of\ size$
3.2	Evidence in running production	Continuous capability Cpk > 1.67 for a stable process, if verified by: • SPC (**S**tatistical **P**rocess **C**ontrol) OR ANY or ALL OF other methods more appropriate for certain processes or products may be used with prior approval from a responsible Design Authority: • Poka-Yoke • 100% automatic detection of defects • Certification in case of Homologation, DOT approval, CE approval, Flammability acc. FMVSS 302, Material Certificate, VDA 4.3 or other customer special characteristic certification requirements etc. ... Reduced capability level shall be defined for specific cases by responsible Design Authority based on overall safety margin analysis. The respective capability level has to be documented on the Drawing.	Continuous capability Cpk > 1.33 for a stable process, if verified by: • SPC (**S**tatistical **P**rocess **C**ontrol) OR ANY or ALL OF other methods more appropriate for certain processes or products may be used with prior approval from an responsible Design Authority: • Poka-Yoke • 100% automatic detection of defects • Certification in case of Homologation, DOT approval, CE approval, Flammability acc. FMVSS 302, Material Certificate, VDA 4.3 or other customer special characteristic certification requirements etc. ... Reduced capability level shall be defined for specific cases by responsible Design Authority based on overall safety margin analysis. The respective capability level has to be documented on the Drawing.

Modification Index

Date	Change
2018-04-01	First version
2019-12-05	Second version
2025-1-9	Third version

This document is referenced in Veoneer Standard VS052.