Parametric Quality Control Tool

Designed & tested in SOLIDWORKS for Manufacturing Support.

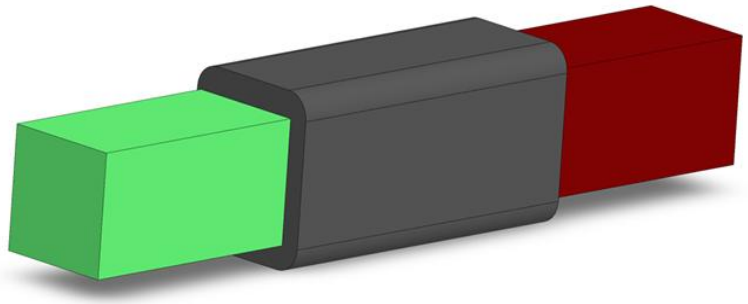
By Mihai Vintila

Go/No-Go Gauge

- The Go/No-Go gauge is a fully adjustable rapid and reliable method to verify if a manufactured part meets the tolerance specifications. This specific gauge is designed to easily adjust to verify any square profile specifications.

Functions:

- - Green “GO”: this side must fit inside the internal square hole to verify that it meets the Minimum Material Condition.
- Red “NO-GO”: this side must not fit inside the internal square hole to verify that it meets the Maximum Material Condition.



Parametric Logic of Gauge

- Green “GO” Side – Defined by adding the Target Hole Size(25mm) + Tolerance (0.1mm)
- Red “NO-GO” Side – Defined solely by Target Hole Size (25mm).
- Global Variables can be easily adjusted to update desired measurements.

Equations, Global Variables, and Dimensions

Filter All Fields

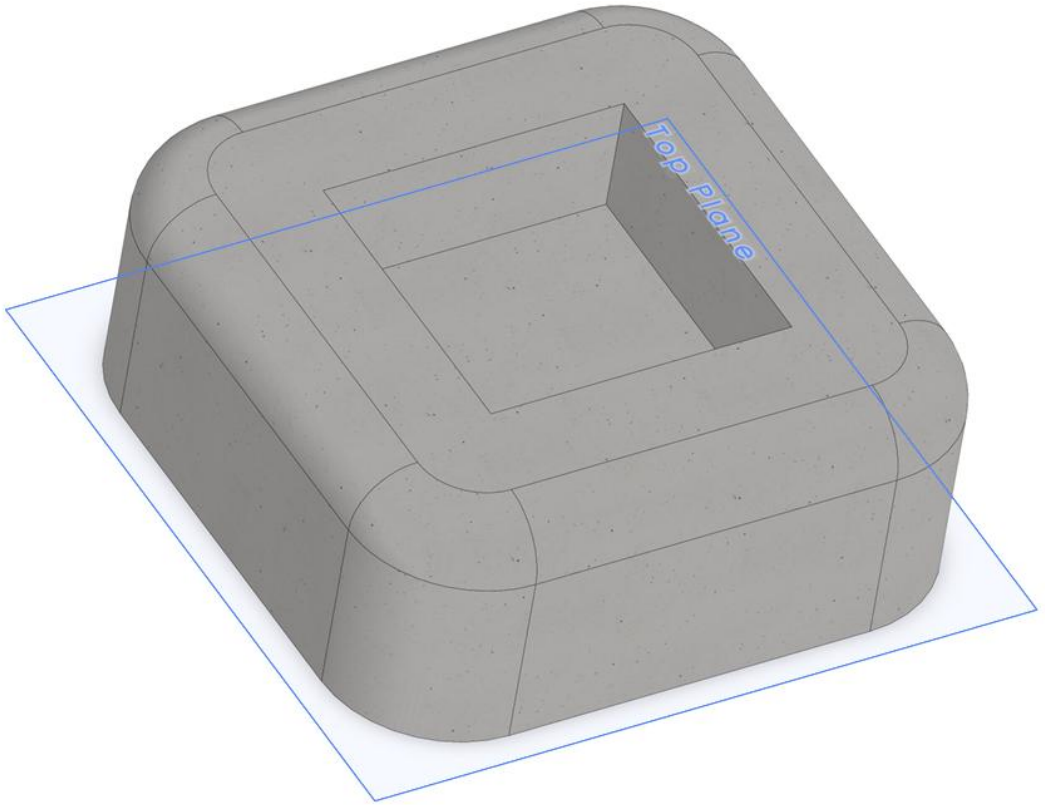
Name	Value / Equation	Evaluates to	Comments
Global Variables			
"Normal_width"	= 25mm	25.00mm	
"Tolerance"	= 0.1mm	0.10mm	
"Clearance"	= 0.05mm	0.05mm	
Add global variable			
Features			
Add feature suppression			
Dimensions			
D1@Sketch1	70.96mm	70.96mm	
D2@Sketch1	35mm	35mm	
D3@Sketch1	35mm	35mm	
D1@Boss-Extrude1	30mm	30mm	
D1@Sketch4	= "Normal_width" + "Tolerance"	25.1mm	
D2@Sketch4	= "Normal_width" + "Tolerance"	25.1mm	
D1@Boss-Extrude3	50mm	50mm	
D1@Sketch5	= "Normal_width" - "Tolerance" - "Clearance"	24.85mm	
D2@Sketch5	= "Normal_width" - "Tolerance" - "Clearance"	24.85mm	
D1@Boss-Extrude4	50mm	50mm	
D1@Fillet6	5mm	5mm	

Automatically rebuild Angular equation units: Degrees Automatic solve order

Link to external file:

Tested Target Component

- This is the verifiable component that will be measured with a tolerance of 0.1mm during my conducted test.
- The component was designed with parametric global variables, meaning it is fully adjustable to different measures, allowing multiple tests to be conducted.



Test

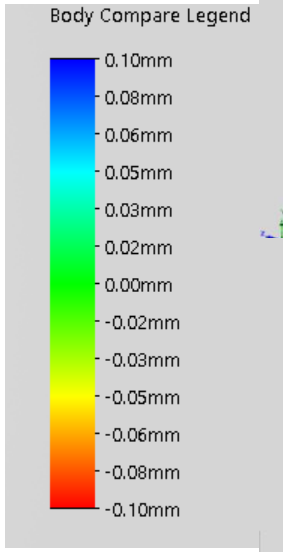
The test I conducted verified if the square profile in the component I created was precisely 25mm with a tolerance of 0.1mm.

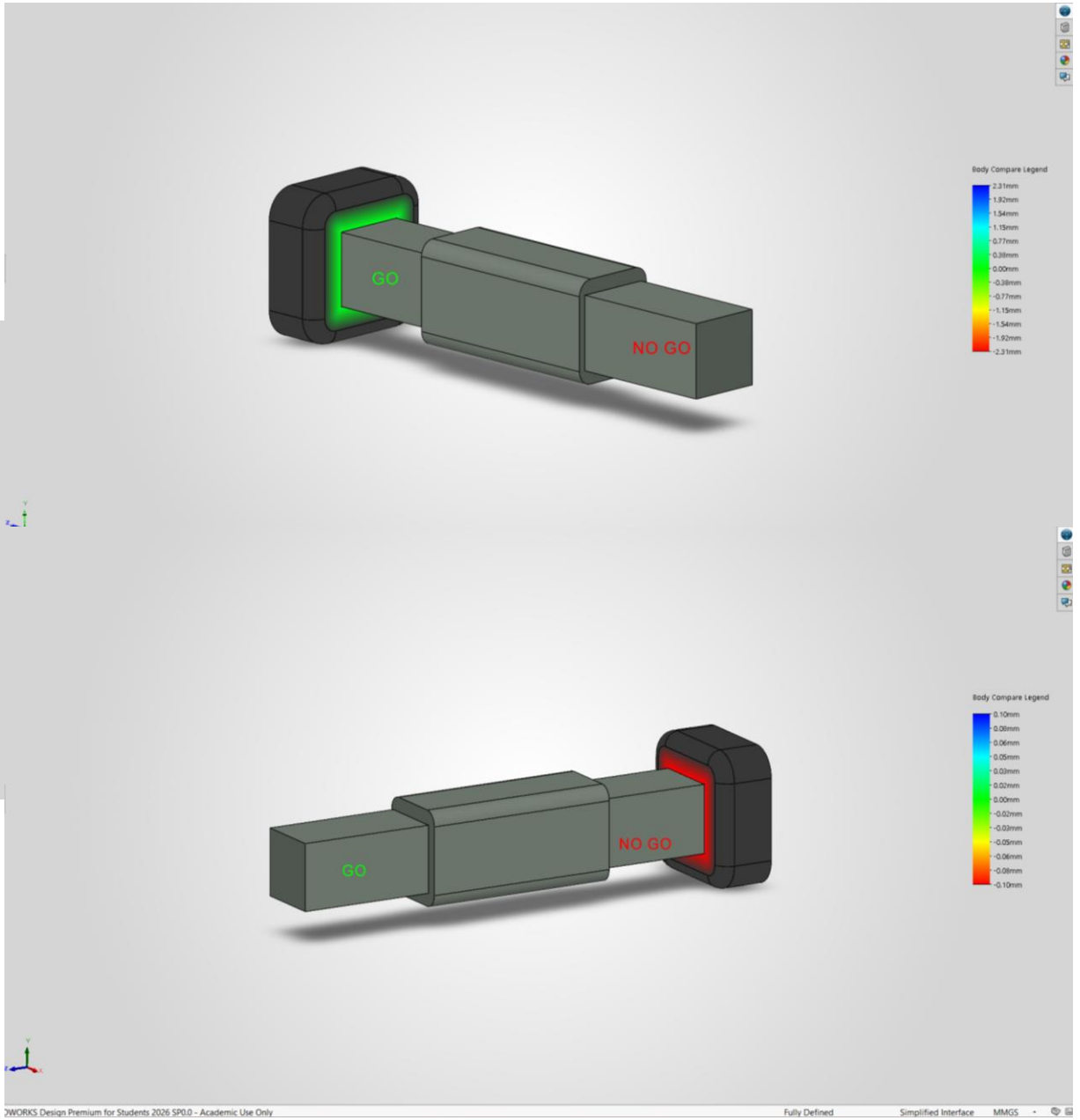
Procedure:

-Green “GO” side (25.00mm) Successful clearance fit. Interference analysis confirms gap in between the edges of the gauge and the hole was less than 0.02mm, meeting the Minimum Material Condition MMC.

-Red “NO-GO” side (25.10mm) Mechanical interference proves that the difference in size in between the given side of the gauge and the hole meets the Maximum Material Condition LMC by failing to enter.

-This test **successfully** verified that the measurement of the square profile is 25mm with a tolerance of 0.1mm.





Conclusion

- Successfully designed a parametric GO/NO-GO Gauge, which eliminates the need for costly steel tooling .
- Verified the design by testing and assembling the two designed parts with the help of the “Mate” tool.
- Design adapts to any engineering change orders through global variable modifications.

Bottom Line: This project illustrates how the parametric modeling of the Go/No-Go Gauge provides reliable verification in manufacturing quality control.

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