

Same Part... Different Look!

This guide will show you how to create 2 versions of the same part, in this Whitepaper, we will be looking at an 'o-ring in it's natural and compressed state .

Intermediate to Advanced Inventor users

'Hardened' Inventor users often ask how to use different parts in use in the application that in the real world are actually the same part.

The example described here is for an o-ring, but this method could be used for all manner of items such as spring washers etc. The problem relates to how you represent the same part in different forms, for example, the o-ring in an original uncompressed form or in a compressed form when fully assembled. The easy answer of course is to simply create two separate parts, but when this applied to an assembly you then have the pain of swapping components and possibly re-constraining them! ... And what happens to the part numbers and BOM?!

The answer to the solution is to create both representations in an iPart. Below is a step by step guide from the start.

1. Create a new part as normal, creating two profiles in the same sketch, one representing the original profile, the other representing a compressed view. (Remember to refer to an origin centre line for revolved items, see below.

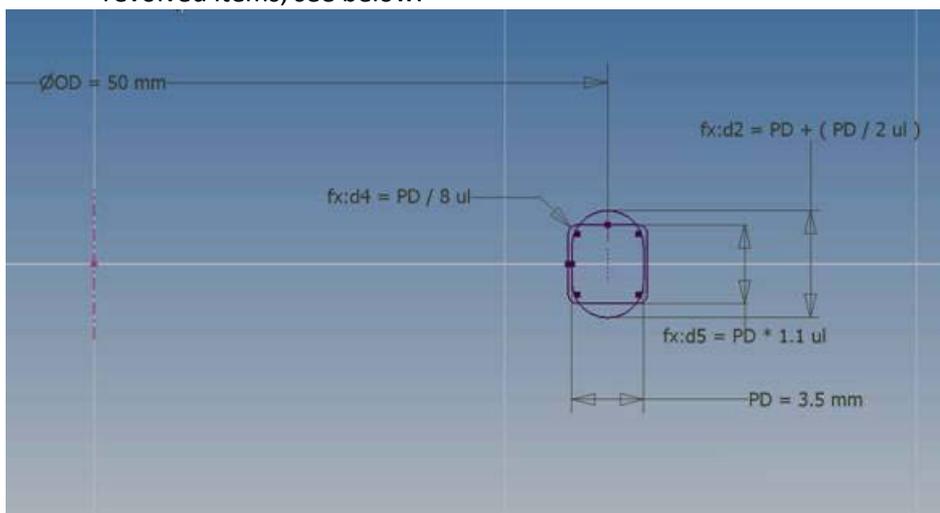


Fig.1

2. Use parameters to control names and values. (This example does use some equations which are not factual, you may want to investigate your own formulae for controlling general sizes, profile shapes and area).

Parameter Name	Unit	Equation	Nominal Value	Tol.	Model Value	Export	Comment
Model Parameters							
OD	mm	50 mm	50.000000		50.000000	<input type="checkbox"/>	Centre diameter
PD	mm	3.5 mm	3.500000		3.500000	<input type="checkbox"/>	Profile diameter
d2	mm	$PD + (PD / 2 \cdot ul)$	5.250000		5.250000	<input type="checkbox"/>	
d4	mm	$PD / 8 \cdot ul$	0.437500		0.437500	<input type="checkbox"/>	
d5	mm	$PD * 1.1 \cdot ul$	3.850000		3.850000	<input type="checkbox"/>	
User Parameters							

Fig.2

3. Revolve the first (uncompressed) profile, then share the sketch and revolve the second (It is good practise to rename the revolves of easy identification).

4. Add any relevant properties to the part before saving (Remember that the part number will be the same for both profile forms).

5. Now create your iPart, creating a compute/suppress for both profiles. Remember to change the part number and member name to suit (see Fig.3).

Member	Part Number	OD	PD	Compressed Profile	Uncompressed Profile
1. O-Ring Example-Uncompressed	OR-100-1	50 mm	3.5 mm	Suppress	Compute
2. O-Ring Example-Compressed	OR-100-1	50 mm	3.5 mm	Compute	Suppress

Fig.3

6. Finally test your model for each row representation. Note that you can easily extend this example to create multiple sizes for both compressed and uncompressed forms. It is recommended that Key-1 is used for size and Key-2 for representation. This method could easily be applied for other items, such as spring washers. The following images are from the example available.

