

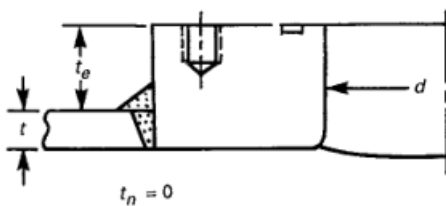
# How to create a reinforced ring opening (studding outlet flange)

Creation of a reinforced ring (studding outlet) along with eventual connection to a blind flange.

Online version: <https://nextgen.sant-ambrogio.it/KB365889>

Latest update: 29 lug 2021

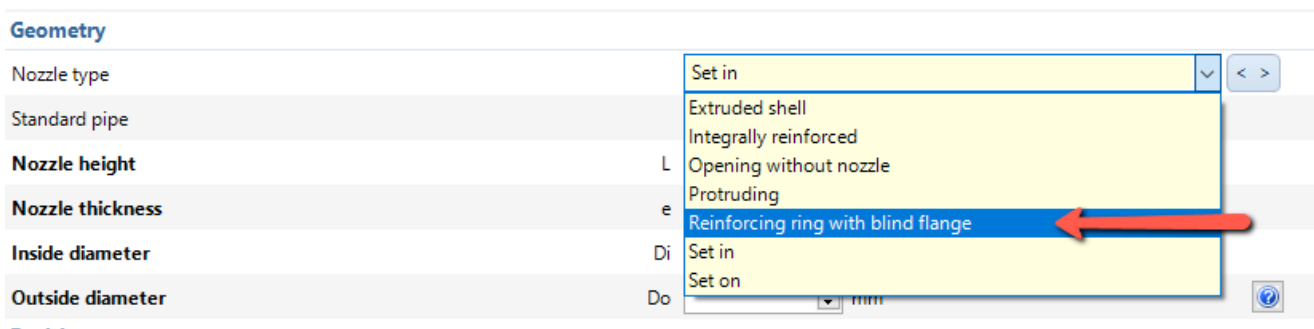
*In this article we're referring to the calculation of those openings in shells reinforced by an usually forged, thick nozzle having holes to connect a blind flange. These outlets have different names in different calculation codes: EN 13445 refers to them as reinforced ring, ASME as studding outlet type flange while they're called reinforcing pad in PD 5500.*



The insertion of a studding outlet takes place from the same command you use to add a nozzle to your vessel:



From the component design window, it is then necessary to select the correct type of nozzle:



*Not all calculation codes have specific rules for this type of attachment. If the code in use does not contain the item Reinforcing ring with blind flange, it is possible to choose the connection type Set in or Set on, depending on whether the nozzle penetrates or is resting on the shell.*

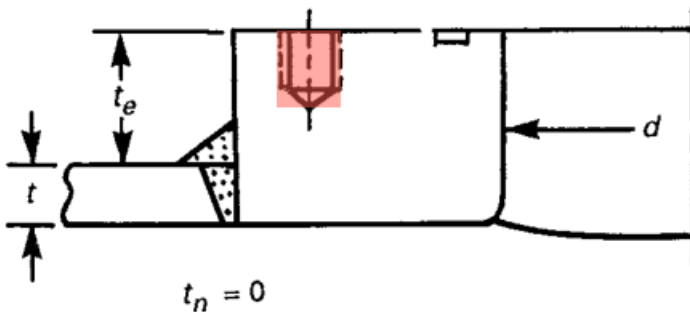
It is then necessary to enable an additional option that allows:

- to connect a blind flange in the 3D model
- to take into account the smaller area of the section when calculating the compensation

<b>Geometry</b>	<b>Nozzle height</b>	L	50	mm
	<b>Nozzle thickness</b>	e	50	mm
	Unsupported length for external pressure calculation		50	mm
	<b>Inside diameter</b>	Di	200	mm
	<b>Outside diameter</b>	Do	300	mm
	Reference diameter		Inside diameter	
	Blind flange connected		<input checked="" type="checkbox"/> <b>Check head size</b>	
	Useful length of the vessel wall		850	mm
	Wall thickness			mm
	Bolts section area		300	mm <sup>2</sup>
	Radius measurements according to Annex E		<input type="checkbox"/>	

In the "Geometry" category, select "Blind flange connected". Using the "Check head size" button it is also possible to size the nozzle on the basis of the dimensions of the blind flange that will be connected.

In the "Bolt section area" enter the section area of two bolt holes:



This area does not contribute to the reinforcement of the opening and will be subtracted during the calculation. The value to be inserted equals two times the depth of the hole times its diameter, since in the worst case the section under analysis includes two bolt holes.

## A note for ASME calculation

As the BPVC does not have an explicit support for such configuration, the nozzle must be treated as a simple set-in connection. When a blind flange is then connected to the studding outlet, validation of tapped bolt holes according to UG-43(g) is automatically performed.