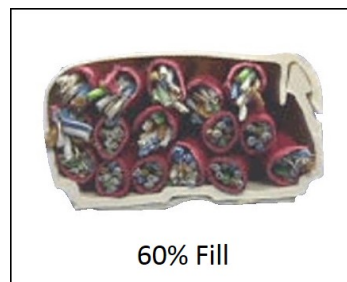


## Calculating Tray, Trunking & Conduit Cable Capacity

The nature of cables means that they do not fill any form of containment in a uniform manner. This means that the actual number of cables that can be contained will be less than the theoretical number. A calculated fill of 60% will actually fill all of the useable space within a given size of containment. This means that, when allowing for 50% spare capacity, the initial fill rate should be only 40%.



To calculate the number of cables that can be contained within a piece of rectangular containment (tray, basket, trunking) the following calculation should be used:

$$\text{Number of cables} = \frac{W \times H \times F}{\pi r^2}$$

where: W = Width of containment  
 H = Height of containment  
 F = Fill percentage  
 r = Radius of the cable

For example, for trunking that is 100mm wide and 50mm deep, using Cat 5e with a diameter of 5.0mm and an initial fill rate of 40% the calculation would be as follows:

$$\text{Number of cables} = \frac{100 \times 50}{3.142 \times 2.5^2} \times 40\% = \frac{5000}{3.142 \times 6.25} \times 40\% = 102 \text{ cables}$$

This would then give the potential for up to 150 cables to be installed before the containment is full to capacity.

The maximum depth of cables in any form of containment is 150mm but this value is reduced for non-continuous containment (basket, ladder, hooks, etc.) according to the following formula:

$$h = 150 / (1 + L \times 0.0007)$$

where: h = maximum depth of cables (mm)  
 L = distance between points of support (mm)

The maximum distance allowed between supporting elements of the support system is 1,500 mm.

For round conduit the number of cables can be calculated as follows:

$$\text{Maximum number of cables} = \frac{0.4 \times I^2}{D^2} - 1$$

where: I = Internal diameter of the conduit  
 D = Diameter of the cable

This assumes smooth wall conduit in straight runs and no corners.