

Cable Tray Fill

The National Electrical Code allows for 50% fill of ventilated cable tray for control or signal wiring (Article 318-9(b)). This rule requires that all the individual cable cross-sectional areas added up may not exceed one half the cable tray area. The cable tray area is equal to the width times the load depth.

In actual practice with Category 5 cables, however, the cable tray is completely full in order to reach the “50% cable fill”. See the picture below. The tray is completely full, but the sum of the cable area is only 50% of the tray area, due to the empty spaces between the cables.



Picture shows 12" wide Cent-R-Rail cable tray with 3" load depth. The tray contains 520 4 UTP Category 5 cables (.21" OD).

This being the case, there is a practical limit to the amount of cables that can be installed in the tray, based on the trays' width and load depth. The following chart shows the approximate cable weight that can be installed without exceeding the 50% fill rule:

Cable Tray Width	Cable Tray Fill Depth		
	3"	4"	6"
6"	7 lbs/ft ^{Group 1}	9 lbs/ft	13.5 lbs/ft
9"	10 lbs/ft	13.5 lbs/ft	20 lbs/ft
12"	13.5 lbs/ft	18 lbs/ft	27 lbs/ft
18"	20 lbs/ft	27 lbs/ft ^{Group 2}	41 lbs/ft
24"	27 lbs/ft	36 lbs/ft	50 lbs/ft

This chart was based on 50% fill of 4 UTP Category 5 cable (O.D. = .21", .026 lbs/ft).

This is not a maximum load rating for the tray, rather a practical guide to the amount of cable weight that can realistically be installed.

For analysis purposes, the loads are separated into 2 groups: less than 25 lbs/ft, and greater than 25 lbs/ft. These groups will be used in the eccentric load study on the following pages.