

**CONDUIT FILL CALCULATION OF CALBLES
FOR
FIRE ALARM SYSTEM**

DATE	: 09.02.2022
NAMEOF FACTORY	: KNIT REFLEX LTD.
LOCATION/ADDRESS	: DHAKA-MUNSIGANJ ROAD, GOGNOGOR, SAYEDPUR, NARAYANGONJ.
DESIGNSTANDARD	: NFPA-72

The cross-sectional area of cable:

$$A = \frac{\pi D^2}{4} \text{ or } A = 0.79D^2$$

Where D = outside diameter (OD) of the cable

For 1.5 mm² wires, we use LLT cable, which diameter is 7.0 mm. So, the cross-sectional area of these cables is

$$A \text{ for cable 1} = 0.79 \times (0.28 \text{ in})^2 \quad [D, 7.0 \text{ mm} = 0.28 \text{ in}] \\ = 0.062 \text{ in}^2$$

For 2.5 mm² wires, we use LLT cable, which diameter is 7.8 mm.

So, the cross-sectional area of these cables is

$$A \text{ for cable 2} = 0.79 \times (0.31 \text{ in})^2 \quad [D, 7.8 \text{ mm} = 0.31 \text{ in}] \\ = 0.076 \text{ in}^2$$

If there is more than one cable being placed in the conduit, the maximum

occupancy. $AT = 0.79D^2 \text{ (Cable 1)} + 0.79D^2 \text{ (Cable 1)} + 0.79D^2 \text{ (Cable 2)} +$

$0.79D^2 \text{ (Cable 2)} + \dots$

If there is 2 cable of 1.5 mm² in conduit,

AT	Area of cable 1 + Area of cable 1
	$0.062 + 0.062 = 0.124 \text{ in}^2$

If there is 2 cable of 2.5 mm² in conduit,

AT	Area of cable 2 + Area of cable 2
	$0.076 + 0.076 = 0.152 \text{ in}^2$

For Conduit, here use PVC jacket. Which is 25 mm² or 1 Inch. SO the Area of the

conduit, $A \text{ of conduit} = 0.79 \times (1 \text{ in})^2 = 0.79 \text{ in}^2$

If we use 1.5 mm², 2 cable in one conduit, then void between Conduit and Cables are, $(0.79 - 0.124) \text{ in}^2 = 0.67 \text{ in}^2$.

If we use 2.5 mm², 2 cable in one conduit, then void between Conduit and Cables are, $(0.79 - 0.152) \text{ in}^2 = 0.64 \text{ in}^2$.

So the void space between Conduit and Cables are 0.67 in^2 & 0.64 in^2 which are both less than 31% of total area of conduit.