

# Reference Material - Methods Permitted

## Wiring methods permitted in cable tray per the 2005 NEC®

1. Armored cable ..... (Article 320)
2. Electrical metallic tubing ..... (Article 358)
3. Electrical nonmetallic tubing ..... (Article 362)
4. Fire alarm cables ..... (Article 760)
5. Flexible metal conduit ..... (Article 348)
6. Flexible metallic tubing ..... (Article 360)
7. Instrumentation tray cable ..... (Article 727)
8. Intermediate metal conduit ..... (Article 342)
9. Liquidtight flexible metal conduit ..... (Article 350)
10. Liquidtight flexible nonmetallic conduit ..... (Article 356)
11. Metal-clad cable ..... (Article 330)
12. Mineral-insulated, metal-sheathed cable ..... (Article 332)
13. Multiconductor service-entrance cable ..... (Article 338)
14. Multiconductor underground feeder and branch-circuit cable ..... (Article 340)
15. Multipurpose and communications cables ..... (Article 800)
16. Nonmetallic-sheathed cable ..... (Article 334)
17. Power and control tray cable ..... (Article 336)
18. Power-limited tray cable ..... (Section 725.61(C) and 725.71(E))
19. Optical fiber cables ..... (Article 770)
20. Other factory-assembled, multiconductor control, signal, or power cables that are specifically approved for installation in cable trays
21. Rigid metal conduit ..... (Article 344)
22. Rigid nonmetallic conduit ..... (Article 352)

# Reference Material - Formulas

## Formulas

• Allowable load:  $w = \frac{F96Sx}{L^2}$

• Deflection:  $\Delta = \frac{5WL^3}{384EIx}$   
 $= \frac{5wL^4}{4608EIx}$

• Stress:  $F = \frac{wL^2}{96Sx}$

• Deflection Multiplier (K) =  $\frac{\text{deflection}}{w}$   
 $= \frac{5L^4}{4608EIx}$

• Max. Working Load =  $\frac{\text{Max. deflection}}{\text{Deflection Multiplier}}$

| Legend |  |
|--------|--|
| w      | = load (lbs/ft)  |
| W      | = total load across span (lbs)   |
| F      | = design stress (lbs/in <sup>2</sup> )   |
| L      | = span (inches)  |
| Sx     | = section modulus for 2 rails (in <sup>3</sup> )<br>(see page 366 for Sx values)             |
| E      | = 10 million for Alum. (lb/in. <sup>2</sup> )<br>29 million for Steel (lb/in. <sup>2</sup> ) |
| Ix     | = moment of inertia for 2 rails (in <sup>4</sup> )<br>(see page 366 for Ix values)           |