ENGINEERED COMPOSITES
STRENGTHENING INDUSTRY

NON-CONDUCTIVE SCAFFOLD TUBE PROPERTIES

Scaffold Tube Properties

MODULUS	30GPa (longitudinal) 7GPa (transverse)
MOMENT OF INTERTIA	198,000mm^4
SECTIONAL AREA	885mm^2
OUTSIDE RADIUS	48.5mm
INSIDE RADIUS	35mm
SECTION MODULUS	$Z = I/y$. $y = 48.5/2 = 24.25mm = 198000/(24.25) = 8165mm^3$
BENDING STRESS	measured tensile strength of a test plaque is 240MPa but maximum fibre stress is normally taken as 100MPa
BENDING MOMENT	$f*Z = 100*8165 = 816500Nmm$
COMPRESSIVE STRENGTH	From other sources the break between short column and long column for a tube of this size is approximately 600mm. So, for any effective vertical scaffold tube it has to design on the long column formula Ultimate compressive stress in long column $F_u = (1.3E)/k\ell/r)1.3$ $K = 1$ for pinned ends which is the conservative approach. So $F_u = (1.3*30000)/(1*\ell/14.95)^{1.3}$ If we take column height $\ell = 2000mm$ then $F_u = (39000)/(133.78)^{1.3} = 39000/581.17$ $F_u = 67.1N/mm^2$ A suggested factor to the working design limit is 3 $F_s = 67.1/3 = 22.36$ Section area is 885mm^2 so design compressive for is $885*22 = 19470N$

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