

Commercial 95TM



Elastic Material Properties

Shadecloth Range

Rev1 10/03

Introduction

The elastic material properties of a fabric is important piece of information for designers of fabric structures. Knowledge of the properties allows the un-stretched dimensions of the fabric to be calculated from the desired stretched dimensions. This information is will be used when cutting out fabric panels for the structure. In addition, the material properties can be used to calculate the stresses and deflections from applied loads, which is an essential part of the safe design of the structure.

Elastic material properties

Stress Ratio	$E_{x.t}$ (kN/m)	$E_{y.t}$ (kN/m)	V_{XY}	V_{YX}	G_{XY}
1:0	6.7	-	-	0.33	0.7
4:1	6.0	15.8	2.06	0.31	0.7
2:1	5.7	17.3	2.50	0.30	0.7
1:1	4.9	22.1	2.54	0.28	0.7
1:2	3.9	26.7	2.58	0.26	0.7
1:4	3.1	31.3	2.66	0.24	0.7
0:1	-	35.1	2.81	-	0.7

Notes:

X represents the length direction

Y represents that width direction

Stress ratio = ratio of length to width tension

G_{XY} obtained from uniaxial testing only

Descriptive terms

$E_{x.t}$ relates length extensions to length tensions

$E_{y.t}$ relates width extensions to width tensions

V_{XY} indicates the extent to which the length contracts when the width is loaded

V_{YX} indicates the extent to which the width contracts when the length is loaded

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