

Annex E

Workboats, Conversion Formulae

A. Conversion Formulae

1. The equivalent laminate thickness is determined in accordance with the following formula:

$$t_{\text{GRP}} = t_{\text{St}} \cdot \sqrt{\frac{\sigma_{\text{aSt}}}{\sigma_{\text{aGRP}}}}$$

For the section modulus of girders subject to bending, correspondingly

$$W_{\text{GRP}} = \frac{\sigma_{\text{aSt}} \cdot W_{\text{St}}}{\sigma_{\text{aGRP}}}$$

t_{GRP} = thickness of GRP plating

t_{st} = thickness of steel plating in accordance with Construction Rules

W_{st} = section modulus of steel girders according to Construction Rules

σ_{aSt} = allowable stress for ordinary hull structural steel; for most components 150 N/mm²

σ_{aGRP} = allowable stress for GRP:

= 0,25 · σ_{bB} for solid laminate plates

= 0,25 · R_{m} for GRP stiffeners

σ_{bB} = ultimate flexural strength [N/mm²], see [Section 1, B.3.2](#)

R_{m} = ultimate tensile strength [N/mm²], see [Section 1, B.3.2](#)