

## Fatigue life prediction of laser and mechanically formed commercially pure grade 2 titanium alloy plates

Properties:

Table 2 : Various parameters used in laser forming

Laser Power (kW)	Thermal Conductivity (W/m. K)	Line Energy (J/m)	Scanning Velocity (m/min)	Beam Interaction Time (seconds)	Heat Flux ( $\times 10^6$ W/m <sup>2</sup> )	Thermal Gradient
1.5	14.99	576	2.6	0.009	3.315	221.14
1.5	14.99	790	1.9	0.012	3.315	221.14
2.5	14.99	1500	1.67	0.014	22.10	1474.5
3	14.99	1500	2	0.012	26.52	1769.2
3.5	14.99	1500	2.33	0.010	30.95	2064.7

Table 4 : The tensile results of commercially pure grade 2 titanium alloy

Ultimate Tensile Strength (MPa)	Yield Strength (MPa)	% Elongation
452	338	28

Stress Strain Curve:

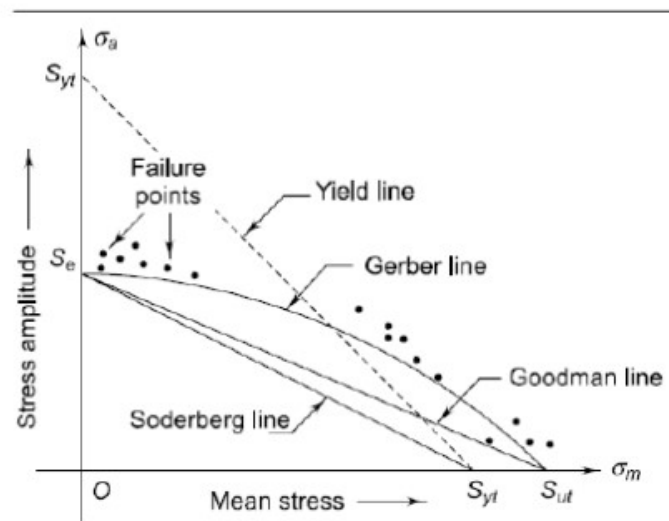


Figure 7 : Soderberg, Gerber and Goodman design criteria

SN Curve:

