finesse
Technical Summary

Laser Quantum
THE D.P.S.S. LASER COMPANY

Overview
The **finesse** heralds a new era in affordable optical pump sources. Delivering 4-6 Watts at 532nm, continuous-wave, and with the diode fibre-coupled to the head; it is small, efficient and does not require water-cooling. These features, combined with noise <0.5% rms (1Hz – 5MHz) and M2 <1.1, make the finesse an ideal OEM laser or research tool.

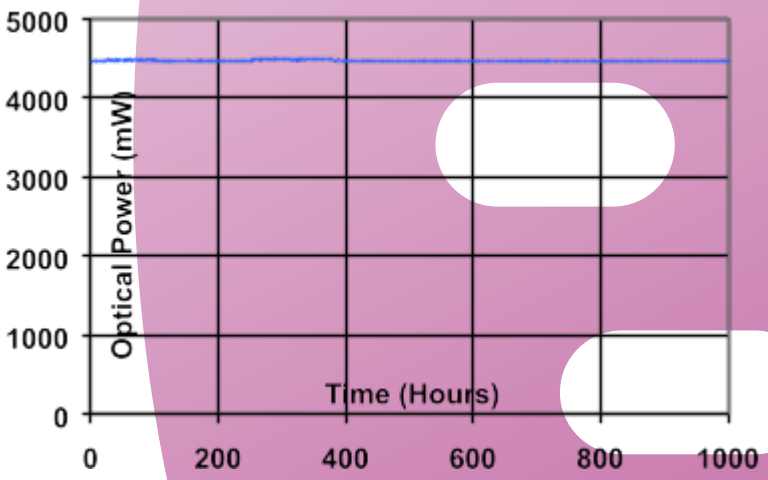
Low Noise
The **finesse**'s pump diode is housed within the power supply and fibre-coupled to the laser head. Thus, thermal effects within the head are minimised. What little heat is generated within the head is removed by conduction - there is no fan or water cooling required. Only high quality optical components are used, resulting in a noise specification of <0.5% rms.
The plot shows a 1000 hour test using a photo-diode with a bandwidth of 6 MHz. During the test, the environmental temperature was varied from 18° to 30° C. The noise level was maintained below 1.5% rms during the test.

Stability
The **fpu 35** power supply is a highly intelligent and functional control unit. It allows the laser to be operated in power or current mode; in power mode the output power is stabilised to <1% using optical feedback to the laser head.
The temperature of all critical components , and of the housing itself, is regulated by PID temperature controllers, solidly maintaining all temperature-sensitive parameters within the cavity at their optimum values.

Beam Quality
The typical M2 value of the **finesse** beam is <1.1. The resulting TEM_{00} beam has >98% fit to a Gaussian profile in both the X and Y directions, with an ellipticity of 1:<1.05.

Construction
Laser Quantum builds all lasers to a high standard, and the **finesse** is no exception.
The effects of shock impacts are minimised by the use of zero-stress mounts throughout the cavity, and the laser's feet are engineered to deform under stress, eliminating mechanical strain within the head.
Before shipment each **finesse** is subjected to rigorous quality assurance, in line with ISO9001. Every unit is N_2 purged and hermetically sealed. There follows a 100 hour burn-in under user-realistic conditions.

The **finesse** is geared towards ultrafast applications as an easily integrable pump-source. However, the high specification and quality that the femtosecond market demands make this laser suitable for all high spec research and industrial applications.



A typical 1000 hour stability test, employing APC.

Specifications		Features
power	4, 6 W	extremely low noise
wavelength	532 nm	automatic power control
spatial quality (M^2)	<1.1	fibre-fed
beam size	2.3 mm	diffraction limited beam
divergence	0.4 mrad	zero-stress, permanently aligned cavity
point stability[1]	<5 urad	hermetically sealed
power stability[2]	<1.0 % rms	diode 22,000 hrs MTBF, 2 yr warranty
noise[3]	<0.5 % rms	RS232 control
bandwidth	50 GHz	physical shutter
coherence length	6 mm	large LCD display, advanced features
beam angle	<1 mrad	extended warranty available
operating temp.	15 - 40 °C	no external, closed-loop cooling

[1]Measured over 36 hours within typical temperature range 20 - 28 °C
[2]Test duration 8 hrs
[3]Test bandwidth 1 Hz - 100 MHz

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Laser Quantum lasers are certified to comply with IEC 60825-1:1993 and Fedral Regulations (21 CFR subchapter J)
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