

NUTDF™



Thulium Doped 2.0 μm Laser and Amplifier Fibers

Extending the useful range of laser & amplifier fibers into the mid-IR

Nufern's NuTDF fibers efficiently give emission at wavelengths beyond 2 microns through significant doping advancement focused on enabling the cross-relaxation, two-for-one pump photon technique. Our NuTDF fibers are available in both single and double-clad designs with up to 60% slope efficiencies. Nufern also offers a range of NuMATCH passive fibers to easily construct fiber lasers and amplifiers by minimizing splicing losses between components. The NuTDF family of thulium doped fibers have been used to set and reset world records and have already found commercial use in medical, industrial and defense applications. Select from a complete family of 2 micron fibers and their matched passive fibers as standard off the shelf and in stock from Nufern.



www.nufern.com



Optical Attributes

- Available in SM and LMA designs for your choice of pure single mode or higher power applications
- 1900 nm → 2175 nm operating wavelengths
- High optical efficiency:
 - Using the cross-relaxation effect Tm doped fibers can achieve quantum efficiencies of ~60% with 793 nm pumping
 - Tm doped fibers have achieved class leading powers >1 kW at ~2 µm
 - A full suite of NuMATCH complementary passive fibers give optimized splicing

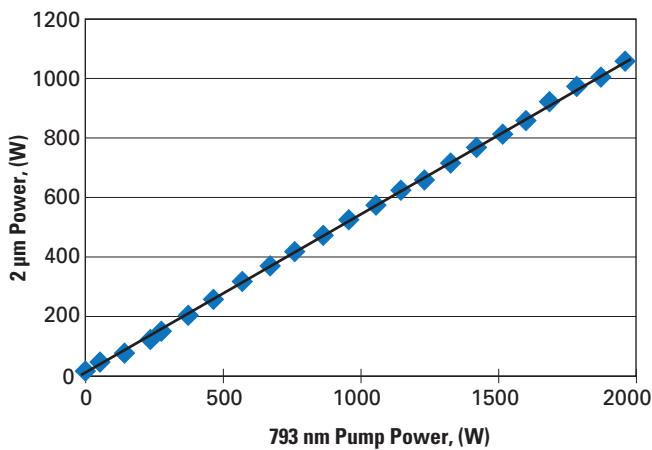
Mechanical Attributes

- Proprietary doping technology – High glass damage threshold.
- NuCOAT_{FA} coating – Enhanced fiber reliability in demanding applications
- Prooftested to 100 kpsi – Excellent mechanical reliability
- High dynamic fatigue strength – Long life expectancy in typical deployment conditions

Applications

- Ideal for LIDAR & LADAR sources
- Point-to-point free space telecommunications transceivers
- Medical applications and surgical lasers
- Organic material processing, plastic cutting, welding, sintering & marking, and eye safe industrial metal cutting & welding

High Output Power at 2 µm (1kW) & High Efficiency from LMA-TDF-20/400 Fiber



Power Efficiency Curves for 2.12 µm Double-Clad Holmium Fiber Laser Pumped at 1950 nm by a Thulium Fiber Laser

