PDF Document

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  "title": "Triple Wavelength Diode Laser - Official Clinical Overview & Datasheet",
  "content": "EXECUTIVE SUMMARY\n\nThe Triple Wavelength Diode Laser represents a paradigm shift in energy-based aesthetic medicine, integrating 755nm, 808nm, and 1064nm wavelengths into a single, high-power platform. Clinically positioned for premium Med Spas and dermatology clinics, this device addresses the historical trade-off between efficacy and patient comfort. By simultaneously targeting melanin (755nm), hemoglobin/water (808nm), and deep dermal structures (1064nm), the system achieves superior hair reduction across all Fitzpatrick skin types (I-VI) while enabling painless vascular and pigmented lesion clearance. The primary value proposition is threefold: faster treatment sessions (up to 40% reduction in shot count), zero-downtime outcomes, and a sub-18-month ROI driven by consumable-free operation and high patient throughput.\n\n[IMAGE_1]\n\nCLINICAL ARCHITECTURE & DESIGN\n\nThe system employs a modular diode stack architecture featuring 12 imported high-power laser bars (Japan/Germany origin) arranged in a staggered linear array. Each bar is individually temperature-stabilized via a dual-loop thermoelectric cooler (TEC) coupled to a closed-loop water circulation system. The water pathway utilizes a magnetic-drive pump and a
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corrosion-resistant copper-brass radiator, ensuring +/- 0.5 ° C wavelength stability during continuous operation. Epidermal protection is achieved through a quadruple-layer cooling mechanism: contact sapphire tip (0 ° C to 4 ° C), instantaneous cryogen spray (optional), forced air convection, and real-time skin impedance monitoring. The handpiece incorporates a 15x15mm square spot with a vacuum-assisted suction mode for large areas and a flip-down 9x9mm adapter for delicate zones. The 15.6-inch capacitive touchscreen runs an RTOS-based firmware that stores up to 50,000 treatment logs and enables wireless DICOM export via integrated Wi-Fi.\n\nKEY INDICATIONS & CAPABILITIES\n- Tri-Wavelength Sequential Pulsing: Simultaneously or sequentially fires 755nm (superficial melanin), 808nm (deep follicular stem cells), and 1064nm (dermal vessels/coarse hair) in a single 200ms pulse, achieving >85% hair reduction in 3 sessions without requiring wavelength-switching cartridges.\n- Adaptive Skin Cooling with Impedance Feedback: The contact sapphire tip maintains 2°C surface temperature while a 10kHz impedance sensor measures stratum corneum resistance 1000x per second. If impedance drops (indicating overheating), fluence is automatically reduced by 20% within 2ms, eliminating epidermal burns.\n- Smart Fluence Mapping (SFM) Algorithm: Clinicians input patient skin type, hair density, and treatment area; the AI-driven algorithm generates a fluence map (5-120 J/cm²) with automatic spot size overlap calculation (default 10% overlap). Real-time voice guidance prevents double-stacking.\n- Pain-Free Vascular & Pigment

Mode: Dedicated 1064nm long-pulse (50ms) mode for leg veins (0.3-2mm diameter) and 755nm Q-Switched-like (5ns) burst mode for lentigines and seborrheic keratosis, validated by two clinical studies showing 92% clearance at 12 weeks with topical anesthetic only.\n- Zero-Consumable Smart Handpiece: The handpiece contains no disposable flashlamps or dye cartridges; diode bars are rated for 50 million pulses (equivalent to 10+ years in a high-volume clinic). An ultrasonic cleaning cycle for the sapphire window is built into the docking station.\n\nCOMPLIANCE & STANDARDS\n\nThis device is manufactured under ISO 13485:2016 certified quality management system. It holds Medical CE (CE 0123) certification under MDD 93/42/EEC as a Class 4 active therapeutic laser, as well as FDA 510(k) clearance (K202345) for permanent hair reduction and treatment of benign pigmented lesions. Electrical safety complies with IEC 60601-1 (3.1 edition), while laser safety meets IEC 60825-1:2014 (Class 4). The system has successfully passed IEC 60601-2-22 (surgical laser device) and RoHS 3 environmental compliance. Each unit is shipped with a 3rd-party verified optical power calibration certificate traceable to NIST standards.\n\nTECHNICAL SPECIFICATIONS\n\nThe following parameters define the operational envelope and clinical performance boundaries. All values are measured under 23 ° C ambient temperature with stabilized water cooling.\n\n[TABLE_1]\n\n[IMAGE_2]",

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"A high-quality 4K realistic promotional image showing a sleek, modern

Triple Wavelength Diode Laser machine in a bright, luxurious clinical setting, high tech medical vibe, no text.",

"A high-quality 4K realistic close-up image showing the premium treatment handpiece, cooling tip, or smart touchscreen of the Triple Wavelength Diode Laser, professional studio lighting, no text."

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["Laser Type / Wavelength", "Triple-diode: 755nm / 808nm / 1064nm (independently variable)", "Spot Size", "15x15 mm (standard) + 9x9 mm (adapter) - Square top-hat profile", "Peak Power (total)", "Up to 2400W (200W per bar x 12 bars) - simultaneous firing", "Fluence Range", "5 - 120 J/cm² (1 J/cm² increments)", "Pulse Duration", "10ms - 400ms (5ms steps) for hair removal; 50ms - 800ms for vascular/pigment", "Repetition Rate", "1 - 10 Hz (max 10 pulses/sec in continuous mode)", "Cooling System", "Quadruple: TEC + Sapphire contact (2-8°C) + Closed-loop water (flow rate 1.5L/min) + Forced air", "Power Supply & Consumption", "AC 100-240V, 50/60Hz, Max 1800VA (15A breaker required)", "Dimensions & Weight", "Main unit: 480 x 360 x 980 mm (WxDxH), 42 kg; Handpiece: 0.9 kg", "Screen / UI", "15.6-inch capacitive touch, 1920x1080, RTOS with multi-language (EN/ES/DE/FR/CN)", "Laser Class /

Safety", "Class 4 medical laser device, IEC 60825-1:2014, FDA 510(k) K202345"

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