

Large aperture Ti:Sapphire amplifiers require a homogenous, flat-top distribution of the pump light in order to reach safely Multi-Terawatt / Petawatt-level laser amplification. But today, commercially available nanosecond SHG pump lasers of Ti:Sapphire crystals show poor spatial profile quality, which can lead to dangerous local hot spots, responsible for strong intensity modulations and potential damages.

That is why SILIOS Technologies has developed a very efficient diffractive homogenizer called SHGH 100 for Ti:Sapphire crystal pumping to supplant unsatisfactory imaging of frequency doubling crystal output and refractive microlens array techniques.

General characteristics

- Diffractive optical pseudo-random phase plates made of SiO₂.
- Can be designed to fit any pump beam geometry
- 1 mm thick and up to 4" size
- Discretized into 8 or 16 phase levels
- On-Axis or Off-Axis configuration
- High damage threshold, limited by AR coating @527 or 532 nm (> 7 to 12J/cm²)
- High efficiency coefficient (≥80%)

Main Advantages (compared to other techniques)

- **Free form shaping** (circular, square or any other shape)
- **Sharp edges**
- **Easy-to-align system**
- **Simple system** (1 diffractive optical element + 1 lens)
- **No Talbot effect**

They Trusted us

In Europe:

Laboratoire d'Optique Appliquée – Commissariat à l'Énergie Atomique - Rutherford Appleton Laboratory – Max Planck Institute Für Quantenoptik – Laboratoire d'Utilisation des Lasers Intenses.

In Asia:

Japan Atomic Energy Agency / Kansai Photon Science Institute – RIKEN - Institute of Physics of Beijing - Shanghai Institute of Fine Mechanics – KAERI

In North America:

University of Nebraska – Lawrence Livermore National Laboratory – Sandia National Labs

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Examples of results

