Focal-πShaper_Q

high efficient laser beam shapers for focused spots transforming Gaussian to Flat-top or Donut profiles

Applications:

- **3D Printing (L-PBF)**
- **Micromachining**
- **Drilling**
- **Scribing**
- **Microwelding**
- **Solar Cell processing**
- **Cutting**

Specifications

Common for all Focal-πShaper_Q models	
Description	Beam shaper, lossless transforming Gaussian beam to the beam with Airy disk profile to get Flat-top or Donut focused spots with minimized side-lobes
Input beam	TEM_{00} M^2<1.5 ±20 mrad divergence
Transmission	>99% in the working spectral range
Alignment	X / Y lateral translation, ±2 mm range

Clear Aperture 20 mm

Diameter	42 mm	Weight	50 g
Length	29 mm	Mounting threads	M30x0.75 outer/inner

Model	$Ø_{input}$ ($1/e^2$), mm	P_{max} CW, W	Spectrum, nm
Focal-πShaper_NIR			
_Q-3	2.5 - 4	100	1500 - 2100
_Q-4	3 - 5		
_Q-5	4 - 6	200	
_Q-7.5	6 - 9		
_Q-10	8 - 12		
Focal-πShaper_1064			
_Q-3	2.5 - 4	100	1020 - 1100
_Q-4	3 - 5		
_Q-5	4 - 6	200	
_Q-7.5	6 - 9		
_Q-10	8 - 12		
_Q-14	11 - 17	300	
Focal-πShaper_TiS			
_Q-3	2.5 - 4	100	750 - 900
_Q-4	3 - 5		
_Q-5	4 - 6	200	
_Q-7.5	6 - 9		
_Q-10	8 - 12		
_Q-14	11 - 17	300	

Model	$Ø_{input}$ ($1/e^2$), mm	P_{max} CW, W	Spectrum, nm
Focal-πShaper_NUV			
_Q-3	2.5 - 4	100	335 - 560
_Q-4	3 - 5		
_Q-5	4 - 6	200	
_Q-7.5	6 - 9		
_Q-10	8 - 12		
Focal-πShaper_266			
_Q-3	2.5 - 4	100	250 - 275
_Q-4	3 - 5		
_Q-5	4 - 6	200	
_Q-7.5	6 - 9		
_Q-10	8 - 12		
Focal-πShaper_1070			
_Q-5_HP	4 - 6	1500	1020 - 1100
_Q-7.5_HP	6 - 9	2000	
_Q-10_HP	8 - 12	3000	
Focal-πShaper_CO2			
_Q-5	4 - 6	200	9000 - 11000
_Q-7.5	6 - 9		
_Q-10	8 - 12		

Clear Aperture 38 mm

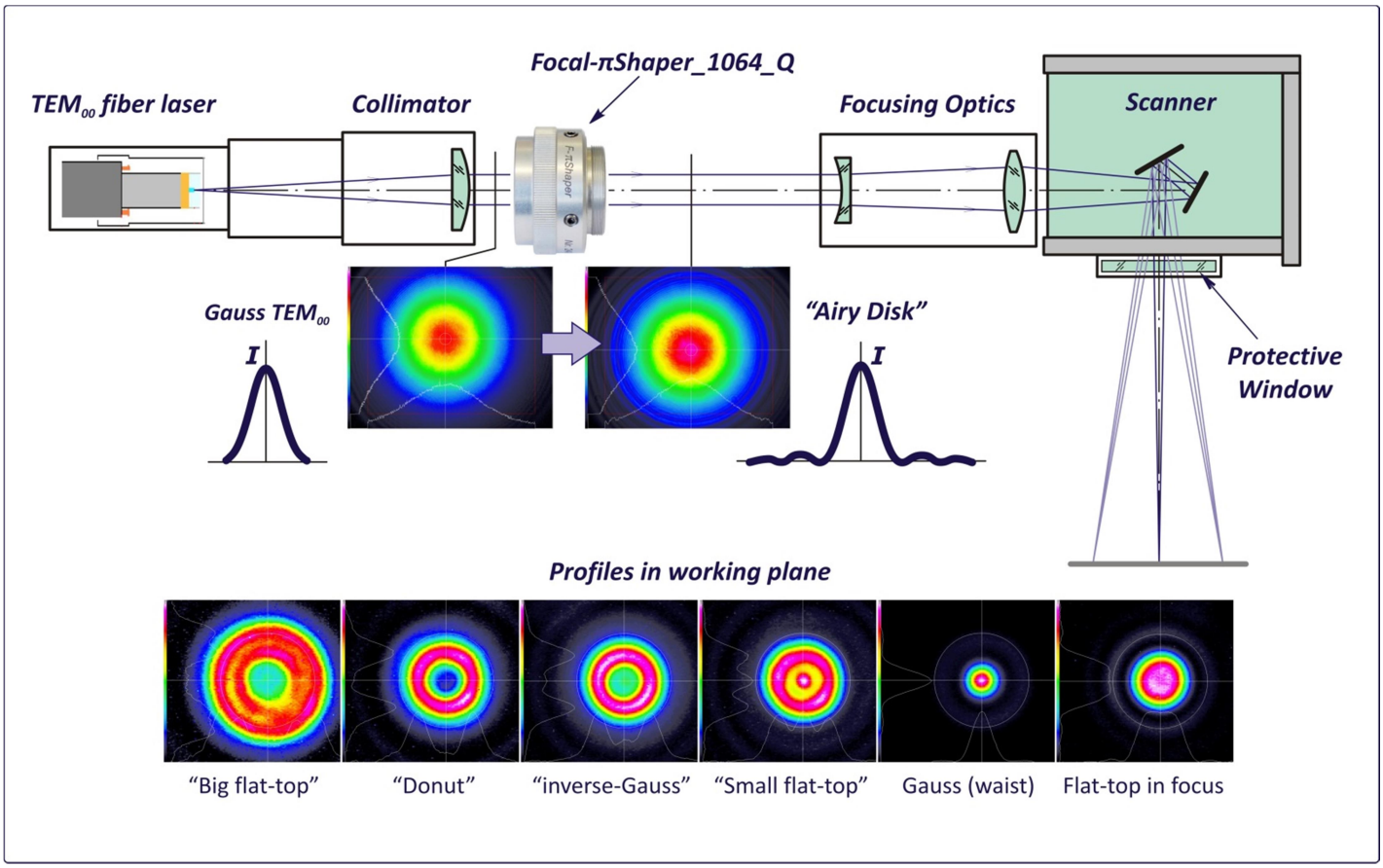
Diameter	64 mm	Weight	70 g
Length	21 mm	Mounting threads	M58x1 outer/inner

Model	$Ø_{input}$ ($1/e^2$), mm	P_{max} CW, W	Spectrum, nm
Focal-πShaper_1064			
_Q-17	15 - 20	400	1020-1100
_Q-20	18 - 23		

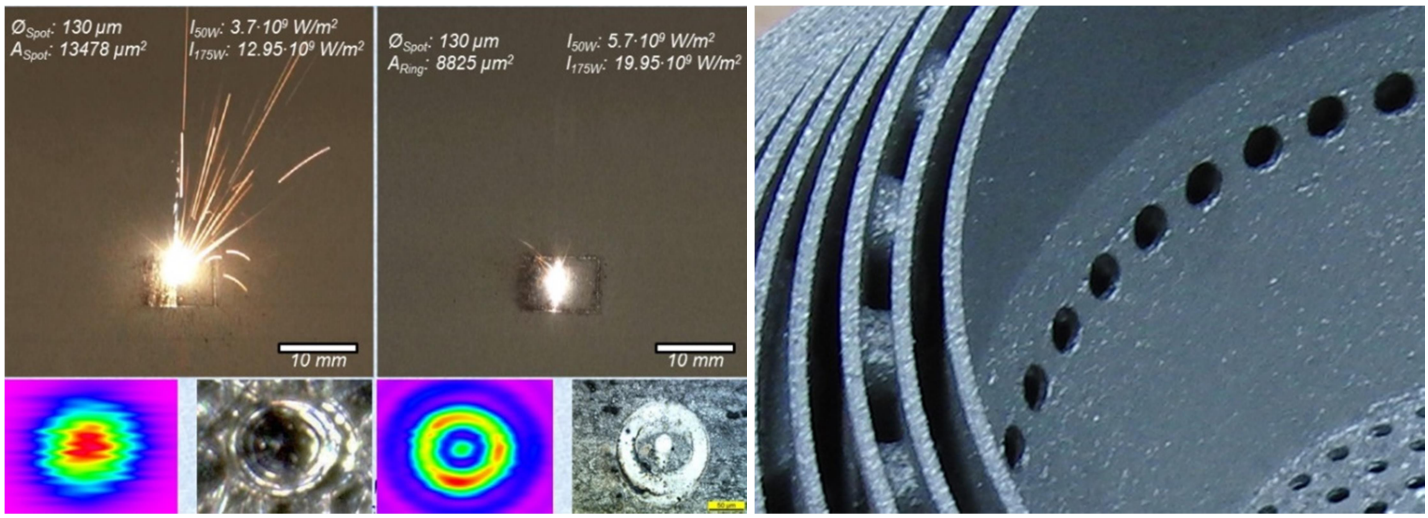
Model	$Ø_{input}$ ($1/e^2$), mm	P_{max} CW, W	Spectrum, nm
Focal-πShaper_1070			
_Q-17_HP	15 - 20	4000	1020-1100
_Q-20_HP	18 - 23	5000	

Beam Shaping never was so easy!

Example of layout for Laser Powder Bed Fusion (L-PBF) with TEM_{00} fiber laser



Example of L-PBF processing *(Courtesy of Forschungszentrum Jülich)*



Gaussian "Donut"

Gaussian to "Donut" spot switching optimizes processes:

- less sparking
- less porosity of a workpiece
- more efficient use of laser energy

Fragment of a part made using L-PBF equipment with an optical system optimized for reliable processing with low porosity and smooth external surfaces:

- *Focal-πShaper* creates the "Donut" spot, and
- *αThermoXX* window minimizes the thermally induced focus shift and aberration.

AdlOptica

www.piShaper.com

Rudower Chaussee 29, 12489 Berlin Germany
Tel. +49-30-565908880 E-mail: info@adloptica.com