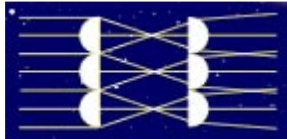


Flat-Top Generator

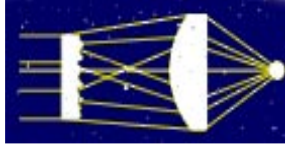


FT-Generator is a refractive single- or double-array laser beam transformer and homogenizer into the Flat Top.

FT is available in optical glass or fused silica for the spectral range of 193 nm - 3.0 μm. Optical transmission (without AR-coating): ~ 92% for single-array and 85% for double-array ones. The divergency angles of standard FTs are 0.3 - 60°. The intensity distribution slope is nearly vertical. The active field of the FT sizes up to 100 x 100 mm².

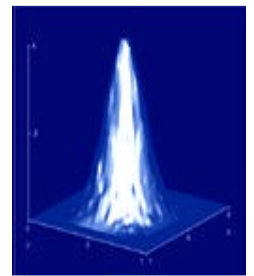


Gaussian Generators



The LBH-G (Laser Beam Homogenizer - Gaussian) is a refractive microoptical element homogenizing the beam and transforming its intensity distribution into the Gaussian one, enabling the uniformity precision of more than 90%.

The Gaussian Generators working wavelength range is $\lambda = 0.193 - 3.00 \mu\text{m}$ providing the uncoated component's transmission of $T > 90\%$ at e.g. $\lambda = 0.193 \mu\text{m}$. Maximal regular size is 100 x 100 mm². Bigger sizes are available on request.

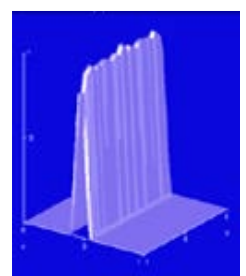


Transformers Line and Cross

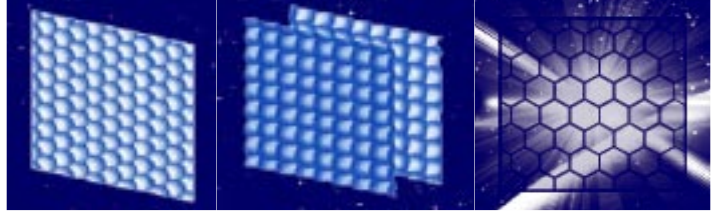
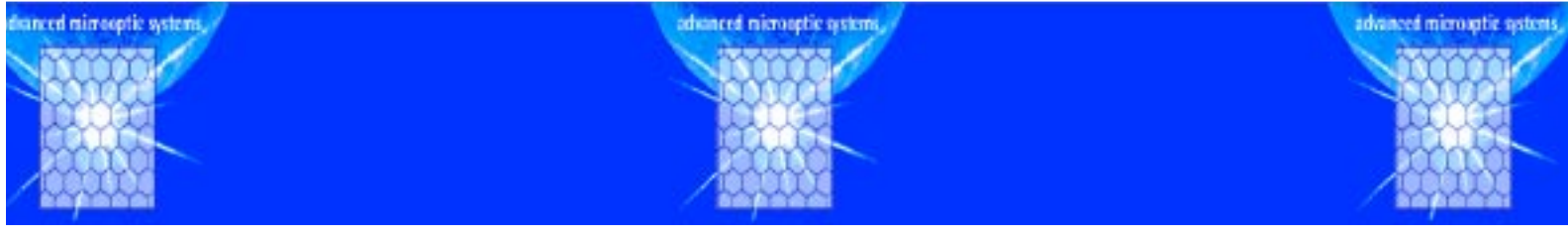


TL(C) is a refractive single- or double-array laser beam transformer into the line/cross.

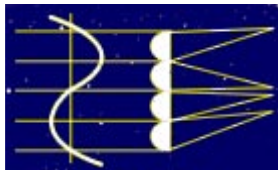
Generators are available for the spectral range of 193 nm - 3 μm. The optical transmission (without AR-coating): ~92% for single-array transformers and over 85% for double-array ones. The divergency angle of the standard single-array TL(C) makes 3 - 50°, the uniformity of the energy distribution along the line - not worse than 15%. The quality of the generated line can be improved (up to 5 %) by means of double-array units, available with the divergency angles from 1° to 60°.



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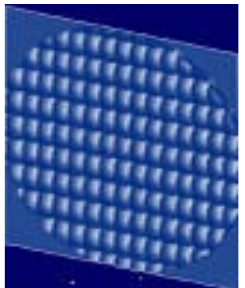


Shack-Hartman
Generators



SH-MB is a refractive single- or double-array unit, splitting or focusing a laser beam into a number of beams.

SH-MBs are available with $f/\#$ between 1/10 and 1/100 for the spectral range of 193 nm - 3.0 μm . Optical transmission (without AR-coating): $\sim 92\%$ for single-array SH-MBs and over 85% for double-array ones.

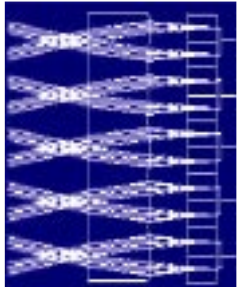


Cylindrical Collimators

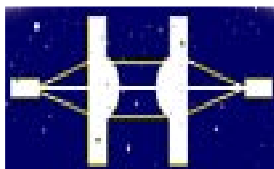


The microlens collimators CF(S) are the refractive microlens elements and/or arrays for the beam collimation of the single standing high-power diode lasers or diode laser stacks.

Available are collimators for the focusing of highly diverging (FWFM $>30^\circ$ -fast axis) and low diverging (slow axis) laser beams. The principle functioning of CF(S)s is based on the emission focusing by means of a cylindrical lens with the aspherical surface. The optical data of the CF(S)s are being determined by the geometry and material of the microlens; achievable M^2 -value less 2; the optical transmission - up to 99%.



Single Lenses & Lens
Arrays



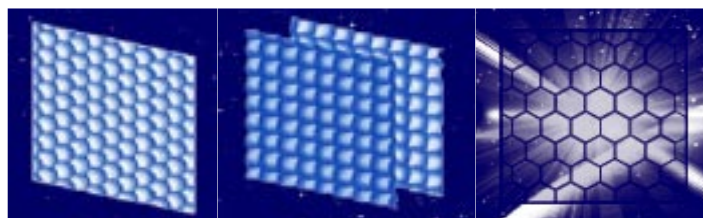
MPs are optically active structures or microstructures including step microstructures, fields, chains of single microlenses, binary diffractive two- or three-order gratings, diffusion masks for laser marking, etc., all to be used for various purposes.

Fabricated in optical glass, fused silica or other materials, the MPs are designed for the spectral range of 193 nm - 11.0 μm and supply the following data:

- Positioning accuracy of elements : +/- 0.5 μm
- Geometrical form precision: about $1/4 \lambda$
- Depth precision: 0.5 % (when depth up to 2 μm)
- 1 % (when depth up to 10 μm)
- 2 % (when depth up to 100 μm)



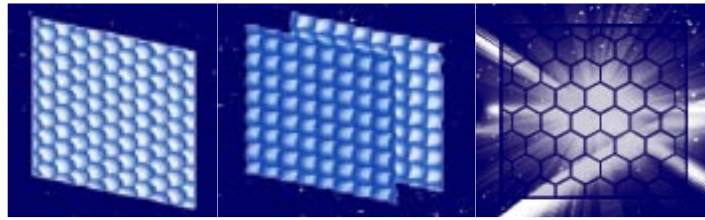
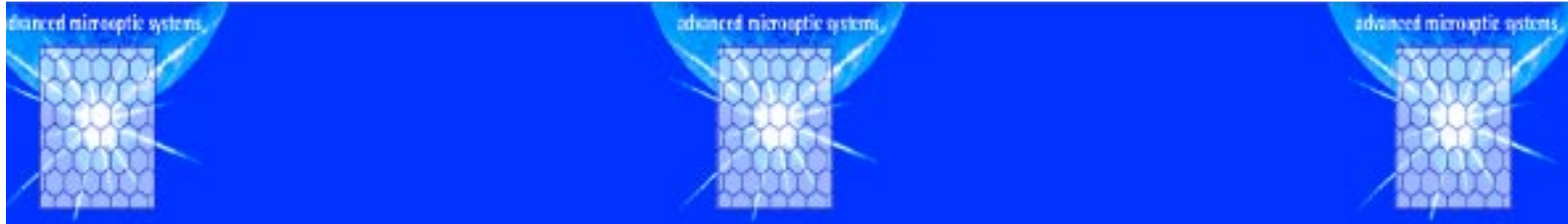
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Positive Arrays

Product Code	Pitch, mm	R, mm	Max.size, mm	Application
APO-Q-P2200-R95.50	2.200	95.50	30x60	SH,MB
APO-GB-P1500-R20.70	1.500	20.70	9x9;6x6;3x3	SH,MB
APO-GB-P1500-R12.40	1.500	12.40	9x9;6x6;3x3	SH,MB
APO-GB-P1200(D1100)-R1.75	1.200	1.75	7.7x7.7	SH,MB,FC
APO-Q-P1100-R48.00	1.100	48.00	30x60	SH,MB
APO-Q-P1100-R95.50	1.100	95.50	30x60	SH,MB
APH-Q-P1000-R16.5	1.000	16.50	30x60	SH,MB,FTH
APO-Q-P1000-R16.5	1.000	16.50	30x60	SH,MB,FTH
APO-Q-P1000-R2.4	1.000	2.40	30x60	SH,MB
APO-GT-P1000(D950)-AR1.65	1.000	1.65	25x25	SH,MB,FTH,FC
APH-Q-P866-R16.50	0.866	16.50	10x10	SH,MB,FTH,FC
APH-Q-P866-R17.70	0.866	17.70	10x10	SH,MB,FTH
APH-Q-P480-R5.0	0.480	5.00	30x60	SH,MB,FTH
APO-Q-P384-R2.75	0.384	2.75	2.6x2.6	SH,MB,FC
APO-Q-P300-R22.60	0.300	22.60	30x60	SH,MB
APH-Q-P250-R1.00	0.250	1.00	30x60	SH,MB,FTH
APO-Q-P222-R0.41	0.222	0.41	4.5x4.5	SH,MB,FC
APO-Q-P222-R1.02	0.222	1.02	4.5x4.5	SH,MB,FC
APO-Q-P192-R3.02	0.192	3.02	2.6x2.6	SH,MB,FC
APO-Q-P150-R4.50	0.150	4.50	30x60	SH,MB,FTH
APO-Q-P150-R1.60	0.150	1.60	30x60	SH,MB,FTH
APO-Q-P148-R0.68	0.148	0.68	4.5x4.5	SH,MB,FC

SH,MB,FTH,FC - Shack-Hartmann Sensing, Multi-Beam Focusing, Flat-Top Homogenizing ,
Fiber Coupling.



Positive Cylindrical Lenses & Arrays

Slow Axis Collimator	Pitch, mm	R,mm	Size (Standard), mm	Application
APC-GT-P500-R2.61	0.500	2.61	15.50 x 5.00 x 1.50	Collimation
APC-GB-P500-R1.05	0.500	1.05	12.00 x 1.50 x 0.93	
APC-GT-P500-R1.80	0.500	1.80	12.00 x 1.50 x 0.93	
APC-GT-P500-R1.90	0.500	1.90	12.00 x 1.50 x 1.50	
APC-Q-P500-R1.7	0.500	1.70	1.50 x 1.50 x 3.55	
APC-GT-P400-R1.80	0.400	1.80	12.00 x 1.50 x 1.00	
APC-Q-P250-R0.81	0.250	0.81	12.00 x 1.50 x 1.00	
APC-Q-P200-R*	0.200	R*	on request	

Slow Axis Collimator -TELESCOPE	Pitch, mm	R,mm	Size (Standard), mm	Application
2APC-GB-P400xP400-R1.75xR1.15	0.400	R1=1.75;R2=1.15	11.30 x 1.50 x 2.55	Collimation
2APC-Q-P250xP250-R0.75xR0.75	0.250	R1=0.75;R2=0.75	10.45 x 3.00 x 2.25	

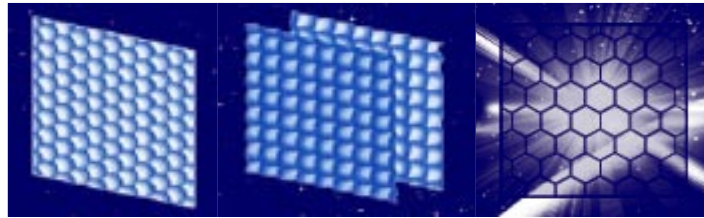
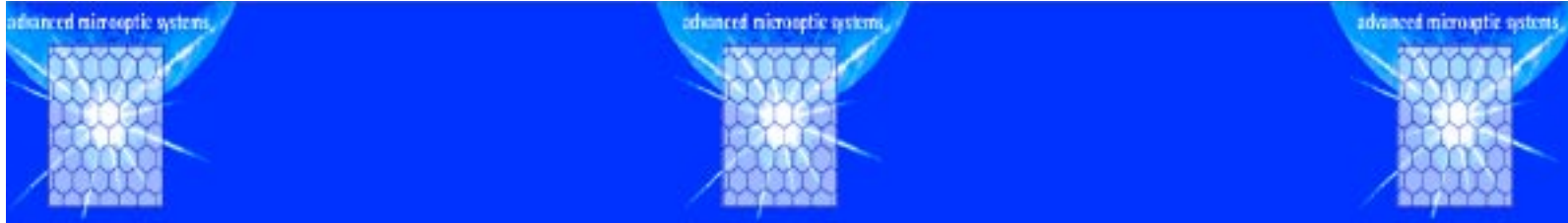
Fast Axis Collimator	ClearAperture, μm	R,mm	Size (Standard), mm	Application
SPC-GT-D1900(CA1300)-AR0.750	1300	0.750(aspherical)	12.00 x 1.90 x 1.10	Collimation
SPC-GT-D900(CA600)-AR0.307	600	0.307(aspherical)	12.00 x 1.50 x 0.60	
SPC-GT-D600(CA400)-AR0.260	400	0.260(aspherical)	12.00 x 2.30 x 0.75	

Cylindrical Lenses Array	Pitch, mm	R,mm	Max.size, mm	Application
APC-Q-P1000-R19.00	1.000	19.00	30x60	TL*
APC-Q-P250-R0.95	0.250	0.95	30x60	TL
APC-Q-P250-R2.80	0.250	2.80	30x60	TL
APC-Q-P700-R1.00	1.000	1.00	d=100	TL
APC-Q-P700-R5.00	0.700	5.00	d=100	TL
2APC-Q-P700xP1000	0.700;1.000	R1=5.0;R2=1.0	d=100	FT*
2APC-Q-P700xP1000	0.700;1.000	R1=1.0;R2=19.00	d=100	FT

*TL, FTQ - refractive single- or double-sided beam transformer and homogenizer into the Flat Top (FT) or into the line/cross (TL/TC).



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Negative Arrays

Product Code	Pitch, mm	Divergency, degree	Max.size, mm	Application
ANH-GB-P1000-(DV1-DV10*)	1.000	1.0 - 10.0	70x70	Homogenizing
ANH-GB-P500-(DV1-DV18)	0.500	1.0 - 18.0	70x70	
ANH-GB-P250-(DV1-DV18)	0.250	1.0 - 18.0	150x150	
ANH-GB-P240-(DV1-DV18)	0.240	1.0 - 18.0	70x70	
ANH-GB-P100-(DV1-DV18)	0.100	1.0 - 18.0	70x70	
ANH-GB-P50-(DV1-DV18)	0.050	1.0 - 18.0	70x70	
ANH-GB-P25-(DV1-DV18)	0.025	1.0 - 18.0	70x70	
ANH-GT-P250-DV65	0.250	65.0	150x150	
ANO-GT-P1500-(DV1-DV10)	1.500	1.0 - 10.0	70x70	
ANO-GB-P1000-(DV1-DV10)	1.000	1.0 - 10.0	70x70	
ANO-GB-P500-(DV1-DV18)	0.500	1.0 - 18.0	70x70	
ANO-GB-P250-(DV1-DV18)	0.250	1.0 - 18.0	70x70	
ANO-GB-P90-(DV1-DV18)	0.090	1.0 - 18.0	70x70	
ANO-GB-P25-(DV1-DV18)	0.025	1.0 - 18.0	70x70	
ANR-GB-(P36xP33.75)-DV13.6	0.036x0.03375	13.60	36x47	
ANH-Q-P1000-(DV1-DV10)	1.000	0.21	30x60	
ANH-Q-P500-(DV1-DV10)	0.500	1.0 - 10.0	70x70	
ANH-Q-P250-(DV1-DV13.5)	0.250	1.0 - 15.5	70x70	

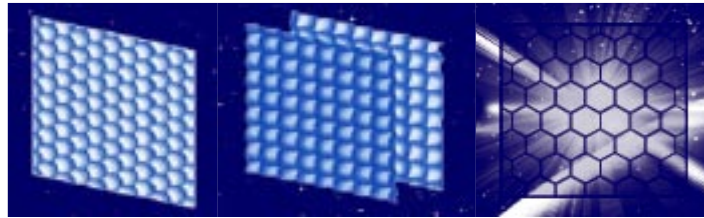
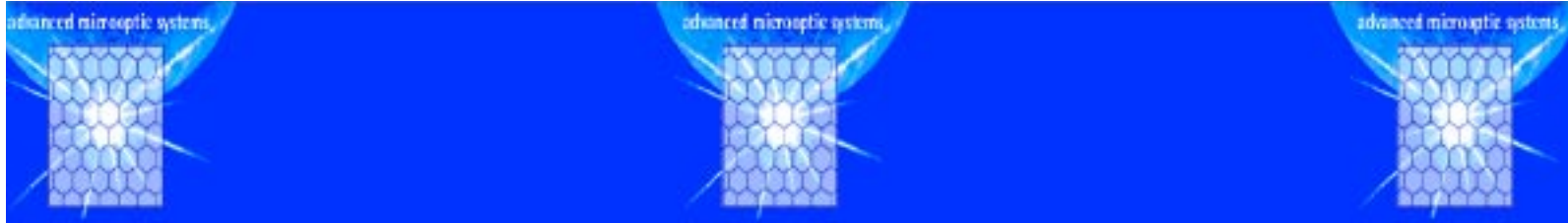
*DV- Divergency for 633 nm; FT-Generator is a refractive single- or double-array beam transformer and homogenizer into the Flat Top.

Negative Arrays Cylindrical

Product Code	Pitch, mm	Divergency, degree	Max.size, mm	Application
ANC-GB-P1500-(DV1-DV10)	1.500	1.0 - 10.0	70x70	Homogenizing
ANC-GB-P1000-(DV1-DV10)	1.000	1.0 - 10.0	70x70	
ANC-GB-P900-(DV1-DV10)	0.900	1.0 - 10.0	70x70	
ANC-GB-P500-(DV1-DV18)	0.500	1.0-18.0	70x70	
ANC-GB-P400-(DV1-DV18)	0.400	1.0-18.0	70x70	
ANC-GB-P250-(DV1-DV18)	0.250	1.0-18.0	70x70	
ANC-GB-P100-(DV1-DV18)	0.100	1.0-18.0	70x70	
ANC-Q-P1000-(DV1-DV5)	1.000	1.0-5.0	70x70	



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Single Lens & Lens Strips

Product Code	Pitch, mm	R, mm	Max.size, mm	Application
LPL-GT-P1100-AR0.66	1.100	0.66	16 Lenses	FC*
LPZ-Q-P1000xP1760(D540)-R0.62	1.000x1.760	0.62	64 Lenses	FC
LP3-Q-P1000(D100)-R0.12	1.000	0.12	3 Lenses	FC
LP(3+2)-Q-P1000(D100)-R0.12	1.000	0.12	5 Lenses	FC
LPL-Q-P750(D420)-R0.75	0.750	0.75	64 Lenses	FC
LPL-GT-P750(D420)-R0.75	0.750	0.75	64 Lenses	FC
SPL-GB-D420-R0.850	0.850	0.85	64 Lenses	FC
SPL-GT-D420-R0.740	0.850	0.74	64 Lenses	FC
LPL-Q-P250(D235)-R0.34	0.250	0.34	48 Lenses	FC
LPL-GT-P250(D235)-R0.27	0.250	0.27	48 Lenses	FC
SPL-GT-D180-R0.16	0.850	0.16	0.5x0.5	FC
SPL-Q-D100-R0.12	0.850	0.12	3St. P=1mm	FC

FC*- Fibre Coupling

Beam Homogenizer - Gaussian

Product Code	Divergency, degree	Max.size, mm	Application
LBH-Q-(DV0.2-DV0.5)	0.2-0.5	50x50	LBH
LBH-Q-(DV0.5-DV1.0)	0.5-1.0	50x50	LBH
LBH-Q-(DV1-DV3)	1.0-3.0	50x50	LBH
LBH-Q-(DV3-DV5)	3.0-5.0	50x50	LBH
LBH-Q-(DV5-DV10)	5.0-10.0	50x50	LBH
LBH-Q-(DV10-DV20)	10.0-20.0	50x50	LBH



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