




PHASE MASKS PRODUCT LIST




Category 1 : Standard Phase Mask – Period from 700 nm to 1200 nm

Spécifications	Base	Option #1	Option #2	Option #3
Period manufacturing tolerance	± 0.3 nm	± 0.3 nm	± 0.1 nm	± 0.1 nm
Diffraction efficiency order 0	≤ 3%	≤ 1.5%	≤ 3%	≤ 1.5%
Diffraction efficiency orders ± 1	≥ 33%	≥ 35%	≥ 33%	≥ 35%
Residual frequency shift (Residual chirp)	≤ 20 pm/cm	≤ 20pm/cm	≤ 20pm/cm	≤ 20pm/cm

Wavelength (λ) (nm) ①	Period (nm) ②	Type ③	Mask dimensions		Clear aperture Height x Width / ∅ (mm) ⑤	Guaranteed zone performance on central line (mm)	
			Height x width / ∅ (mm)	Thickness (mm)			
			④				
193 @ 320	700 @ 1200	PM 	25.4 ∅	3.2	19 ∅	15	
			50.8 ∅	3.2	44 ∅	35	
				10	44 ∅	35	
		RPM 	18.8 x 38.1	3.2	10 x 10	7	
					10 x 20	15	
					10 x 30	25	
			25 x 25	3.2	20 x 25	25	
					25 x 30	2	10 x 25
			25.4 x 25.4	3.2	10 x 20	15	
					20 x 20	15	
			38.1 x 38.1	3.2	20 x 30	25	
			50.8 x 50.8	3.2	30 x 45	40	
			RPM (PAIR) 	10 x 20	3.2	8 x 20	15
				12.5 x 25.4	3.2	8 x 20	15
						10 x 10	7
				15 x 15	3.2	10 x 10	7
		18.8 x 38.1		3.2	10 x 10	7	
					10 x 30	25	
		25.2 x 50.8	3.2	10 x 45	40		
				15 x 45	40		




Category 2 : Standard Phase Mask – Period from 500 nm to 659.9 nm

Spécifications	Base	Option #1	Option #2	Option #3
Period manufacturing tolerance	± 0.3 nm	± 0.3 nm	± 0.1 nm	± 0.1 nm
Diffraction efficiency order 0	≤ 4%	≤ 2%	≤ 4%	≤ 2%
Diffraction efficiency order ± 1	≥ 30%	≥ 33%	≥ 30%	≥ 33%
Residual frequency shift (Residual shift)	≤ 20pm/cm	≤ 20pm/cm	≤ 20pm/cm	≤ 20pm/cm

Wavelength (λ) (nm) ①	Period (nm) ②	Type ③	Mask dimensions		Clear aperture Height x Width / Ø (mm) ⑤	Guaranteed zone performance on central line (mm)	
			Height x Width / Ø (mm)	Thickness (mm)			
			④		⑤		
193 @ 270	500 @ 659.9	PM 	25.4 Ø	3.2	19 Ø	15	
			50.8 Ø	3.2	44 Ø	35	
		RPM 	18.8 x 38.1	3.2	10 x 10		7
					10 x 20		15
					10 x 30		25
			25 x 25	3.2	20 x 25		25
					25 x 30	2	10 x 25
			25.4 x 25.4	3.2			10 x 20
					20 x 20		15
			38.1 x 38.1	3.2	20 x 30		25
					50.8 x 50.8		30 x 45
			RPM (PAIR) 	10 x 20	3.2	8 x 20	
		8 x 20				15	
		12.5 x 25.4		3.2	10 x 10		7
					15 x 15		7
		18.8 x 38.1		3.2	10 x 10		7
					10 x 30		25
		25.2 x 50.8		3.2	10 x 45		40
					15 x 45		40


Category 3 : Standard Phase Mask – Period from 660 nm to 699.9 nm

Specifications	Base	Option #1	Option #2	Option #3
Period manufacturing tolerance	± 0.3 nm	± 0.3 nm	± 0.1 nm	± 0.1 nm
Diffraction efficiency Ordrer 0	≤ 3%	≤ 2%	≤ 3%	≤ 2%
Diffraction efficiency order ± 1	≥ 33%	≥ 34%	≥ 33%	≥ 34%
Residual frequency shift (Residual chirp)	≤ 20pm/cm	≤ 20pm/cm	≤ 20pm/cm	≤ 20pm/cm

Wavelength (λ) (nm) ①	Period (nm) ②	Type ③	Mask dimension		Clear aperture Height x Width / Ø (mm) ⑤	Guaranteed zone performance on central line (mm)
			Heigh x Width / Ø (mm)	Thickness (mm)		
			④		⑤	
193 @ 270	660 @ 699.9	PM 	25.4 Ø	3.2	19 Ø	15
			50.8 Ø	3.2	44 Ø	35
		RPM 	18.8 x 38.1	3.2	10 x 10	7
					10 x 20	15
					10 x 30	25
			25 x 25	3.2	20 x 25	25
			25 x 30	2	10 x 25	20
			25.4 x 25.4	3.2	10 x 20	15
					20 x 20	15
			38.1 x 38.1	3.2	20 x 30	25
		50.8 x 50.8	3.2	30 x 45	40	
		RPM (PAIR) 	10 x 20	3.2	8 x 20	15
			12.5 x 25.4	3.2	8 x 20	15
					10 x 10	7
			15 x 15	3.2	10 x 10	7
			18.8 x 38.1	3.2	10 x 10	7
					10 x 30	25
					10 x 45	40
			25.2 x 50.8	3.2	15 x 45	40




Category 1 : Apodized Phase Mask – Period from 700 nm to 1200 nm

Specifications	Base	Option #1
Period manufacturing tolerance	± 0.3 nm	± 0.1 nm
Precision FWHM	± 0.4 mm	± 0.4 mm
Diffraction efficiency order 0	≤ 6%	≤ 6%
Diffraction efficiency orders ± 1	≥ 30%	≥ 30%
Residual frequency shift (Residual chirp)	≤ 20pm/cm	≤ 20pm/cm

Wavelength (λ) (nm) ①	Period (nm) ②	Type ③	Mask dimensions		Guaranteed zone performance on central line (mm)	Apodized profile FWHM (mm) ⑤
			Height x Width / ∅ (mm)	Thickness (mm)		
④						
244 @ 248	700 @ 1200	PM 	25.4 ∅	3.2	7	2.3
					9	3.9
					11	5.3
					15	7.5



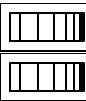
**Category 1 : Chirped Phase Mask – Period from 700 @ 1200 nm /
Chirp of 0.5 @ 20 nm/cm**

Specifications	Base	Option #1	Option #2	Option #3
Period manufacturing tolerance	± 0.5 nm	± 0.5 nm	± 0.3 nm	± 0.3 nm
Controlled frequency shift (chirp)	± 10% chirp	± 10% chirp	± 10% chirp	± 10% chirp
Diffraction efficiency order 0	≤ 5%	≤ 2%	≤ 5%	≤ 2%
Diffraction efficiency orders ± 1	≥ 30%	≥ 33%	≥ 30%	≥ 33%

Wavelength (λ) (nm) ①	Period (nm) ②	Chirp (nm/cm) ⑥	Type ③	Mask dimensions		Clear aperture Height x Width / ∅ (mm) ⑤	Guaranteed zone performance on central line (mm)		
				Height x Width / ∅ (mm)	Thickness (mm)				
				④					
193 @ 320	700 @ 1200	0.5 @ 20	PM 	25.4 ∅	3.2	19 ∅	15		
				50.8 ∅	3.2	44 ∅	35		
					10	44 ∅	35		
			RPM 	18.8 x 38.1	3.2	10 x 10	7		
						10 x 20	15		
						10 x 30	25		
				25 x 25	3.2	20 x 25	25		
						25 x 30	2	10 x 25	20
								10 x 20	15
						25.4 x 25.4	3.2	20 x 20	15
				20 x 30	25				
				RPM (PAIR) 	10 x 20	3.2	8 x 20	15	
							8 x 20	15	
			12.5 x 25.4		3.2	10 x 10	7		
						10 x 10	7		
			15 x 15	3.2	10 x 10	7			
					10 x 30	25			
18.8 x 38.1	3.2	10 x 45	40						
		15 x 45	40						
25.2 x 50.8	3.2								



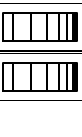
Category 2 : Chirped Phase Mask – Period from 700 to 1200 nm / Chirp of 20.1 @ 40 nm/cm

Specifications	Base	Option #1	Option #2	Option #3
Period manufacturing tolerance	± 0.5 nm	± 0.5 nm	± 0.3 nm	± 0.3 nm
Controlled frequency shift (chirp)	± 10% chirp	± 10% chirp	± 10% chirp	± 10% chirp
Diffraction efficiency order 0	≤ 5%	≤ 2%	≤ 5%	≤ 2%
Diffraction efficiency orders ± 1	≥ 30%	≥ 33%	≥ 30%	≥ 33%

Wavelength (λ) (nm) ①	Périod (nm) ②	Chirp (nm/cm) ⑥	Type ③	Mask dimensions		Clear aperture Height x Width / ∅ (mm) ⑤	Guaranteed Zone performance On central line (mm)		
				Height x Width / ∅ (mm)	Thickness (mm)				
				④					
193 @ 320	700 @ 1200	20.1 @ 40	PM 	25.4 ∅	3.2	19 ∅	15		
				50.8 ∅	3.2	44 ∅	35		
					10	44 ∅	35		
			RPM 	18.8 x 38.1	3.2	10 x 10	7		
						10 x 20	15		
						10 x 30	25		
				25 x 25	3.2	20 x 25	25		
						25 x 30	2	10 x 25	20
								25.4 x 25.4	3.2
				38.1 x 38.1	3.2	20 x 20	15		
						20 x 30	25		
				50.8 x 50.8	3.2	30 x 45	40		
			10 x 20			3.2	8 x 20	15	
			RPM (PAIR) 	12.5 x 25.4	3.2	8 x 20	15		
						10 x 10	7		
				15 x 15	3.2	10 x 10	7		
						10 x 10	7		
				18.8 x 38.1	3.2	10 x 30	25		
10 x 45	40								
25.2 x 50.8	3.2	15 x 45	40						



**Category 3 : Chirped Phase Mask – Period from 635 to 699.9 nm /
Chirp of 0.5 @ 20 nm/cm**

Specifications	Base	Option #1	Option #2	Option #3
Period manufacturing tolerance	± 0.5 nm	± 0.5 nm	± 0.3 nm	± 0.3 nm
Controlled frequency shift (chirp)	± 10% chirp	± 10% chirp	± 10% chirp	± 10% chirp
Diffraction efficiency order 0	≤ 5%	≤ 3%	≤ 5%	≤ 3%
Diffraction efficiency orders ± 1	≥ 30%	≥ 33%	≥ 30%	≥ 33%

Wavelength (λ) (nm) ①	Period (nm) ②	Chirp (nm/cm) ⑥	Type ③	Mask dimensions		Clear aperture	Guaranteed zone performance on central line (mm)
				Height x Width / ∅ (mm)	Thickness (mm)	Height x Width / ∅ (mm) ⑤	
				④			
193 @ 320	635 @ 699.9	0.5 @ 20	PM 	25.4 ∅	3.2	19 ∅	15
				50.8 ∅	3.2	44 ∅	35
			RPM 	18.8 x 38.1	3.2	10 x 10	7
						10 x 20	15
						10 x 30	25
				25 x 25	3.2	20 x 25	25
				25 x 30	2	10 x 25	20
						25.4 x 25.4	3.2
				38.1 x 38.1	3.2	20 x 20	15
						20 x 30	25
				50.8 x 50.8	3.2	30 x 45	40
				RPM (PAIR) 	10 x 20	3.2	8 x 20
			12.5 x 25.4		3.2	8 x 20	15
						10 x 10	7
			15 x 15		3.2	10 x 10	7
			18.8 x 38.1		3.2	10 x 10	7
						10 x 30	25
			25.2 x 50.8	3.2	10 x 45	40	
					15 x 45	40	

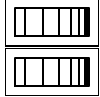
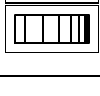
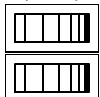
Category 1 : Standard Long Phase Mask – Period from 700 nm @ 1100 nm

Specifications	Base	Option #1
Period manufacturing tolerance	± 0.3 nm	± 0.3 nm
Diffraction efficiency order 0	≤ 5	≤ 3%
Diffraction efficiency orders ± 1	≥ 30	≥ 33%
Residual frequency shift (Residual chirp)	≤ 10pm/cm	≤ 10pm/cm

Wavelength (λ) (nm) ①	Period (nm) ②	Type ③	Mask dimensions		Clear aperture	Guaranteed zone performance on central line (mm)
			Heigh x Width / \varnothing (mm)	Thickness (mm)	Heigh x Width / \varnothing (mm) ⑤	
			④			
193 @ 320	700 @ 1100	LPM 	15 x127	2.3	10 x 120	100
			20 x127	2.3	10 x 120	100
		LPM (PAIR) 	15 x 127	2.3	10 x 120	100

Category 2 : Chirped Long Phase Mask – Period from 700 @ 1100 nm / Chirp of 0.01 @ 20 nm/cm

Specifications	Base	Option #1
Period manufacturing tolerance	± 0.5 nm	± 0.5 nm
Controlled frequency shift precision (chirp)	± 10% chirp ou min = 0.005 nm/cm	
Diffraction efficiency order 0	≤ 5%	≤ 3%
Diffraction efficiency orders ± 1	≥ 30%	≥ 33%

Wavelength (λ) (nm) ①	Period (nm) ②	Chirp (nm/cm) ③	Type ④	Mask dimensions		Clear aperture Height x Width / Ø (mm) ⑤	Guaranteed zone performance on central line (mm)
				Height x Width / Ø (mm)	Thickness (mm)		
				⑥			
193 @ 320	700 @ 1100	0.01 @ 20	LPMC 	15 x 127		10 x 120	100
				20 x 127		10 x 120	100
			LPMC (PAIR) 	15 x 127		10 x 120	100