

User manual of cylinder CGH

1. Open the packaging, Cylinder CGH is covered by cleanroom wiper, the upper side is defined as the pattern side.

Notice: It is advised to cover the cylinder CGH each time when you finish measurement to avoid the pattern side to be scratched or polluted.



Figure 1: Packaging of cylinder CGH

2. We have four specifications of products (2 inch, 3 inch, 4 inch, 6 inch), Different accessories are needed according to different specifications. A six-degree frame and a transfer frame are necessary for 2 inch and 3 inch cylinder nulls. Figure 2 shows the mounted schematic diagram:

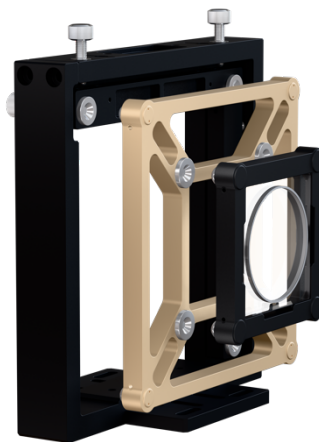


Figure 2: 2&3 inch cylinder CGH mounted on frame

Only a six-degree frame is needed for 4/6 inch cylinder CGH as shown in figure 3:



Figure 3: 4&6 inch cylinder CGH mounted on frame

3. Mount the cylinder nulls on the six-degree frame though four magnetic balls, when the cylinder CGH is mounted with the right direction, the direction of etched text is shown as Figure 4:

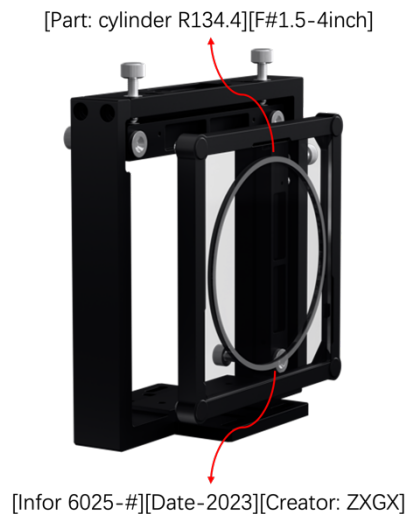


Figure 4: Installation diagram of cylinder CGH

4. Install the fitted TF reference lens on interferometer and make sure it is adjusted properly.
5. Put the mounted CGH as well as the frame in the optical path, make sure the etched side is facing the cylinder lens under test.
6. Adjust the position of the CGH to ensure that it is fully covered by the light from

the interferometer, then adjust the six-degree frame to align the zero order spot in the center, then the working diffraction order is located in the blue circle as shown in Figure 5:

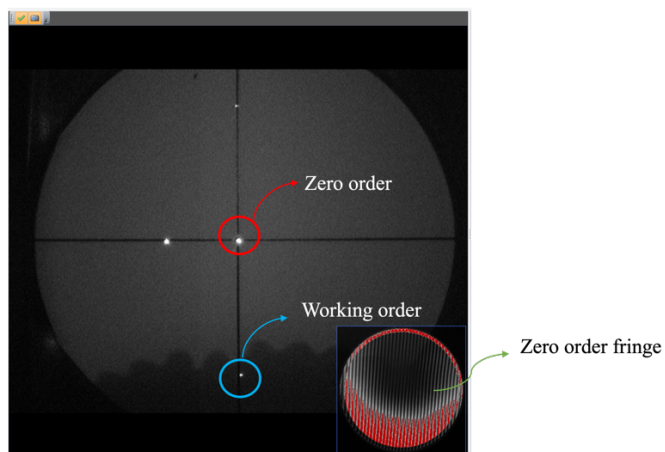


Figure 5: Diagram of diffraction order

7. Adjust the frame to make sure the working diffraction order in the center, as illustrated in Figure 6:

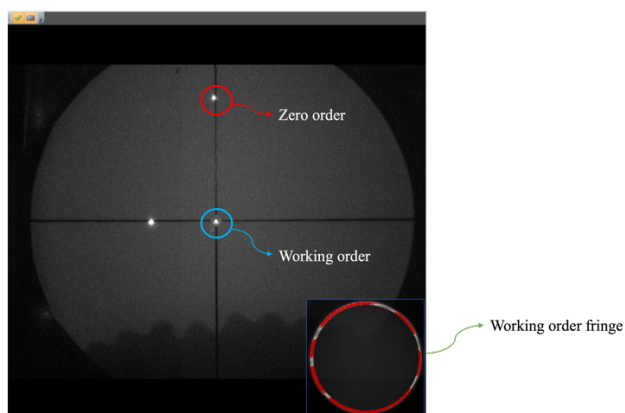


Figure 6: Diagram of working order in the right position

8. Switch to the fringe mode and make sure it is null pattern as illustrated in Figure 7:

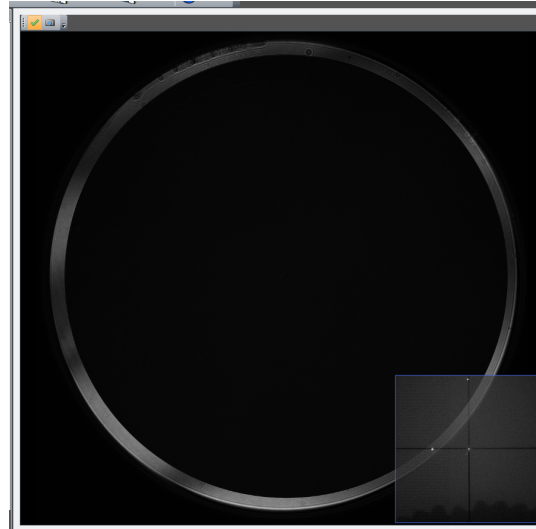


Figure 7: Diagram of fringe pattern in null position

9. Without special circumstances, it is not allowed to adjust the interferometer and the cylinder CGH.

10. Adjust the cylinder lens.

10.1 When the cylinder lens is concave, With the corresponding radius of R , If the focal length of cylinder CGH is f , then the optical path shown in Figure 8:

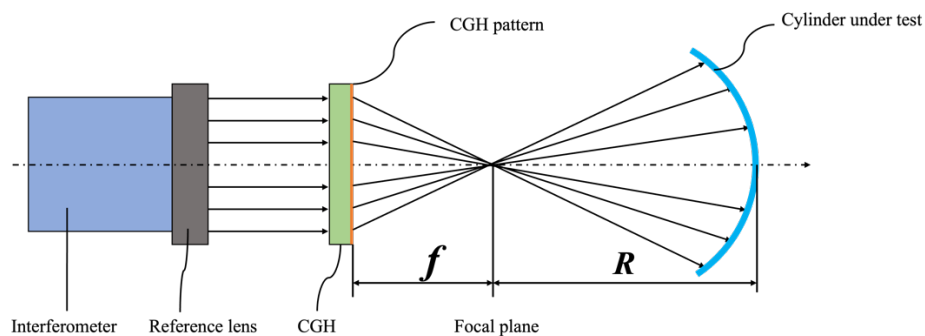


Figure 8: Diagram of optical path for testing concave cylinder lens

10.2 When the cylinder lens is convex, With the corresponding radius of R , If the focal length of cylinder CGH is f , then the optical path shown in Figure 9:

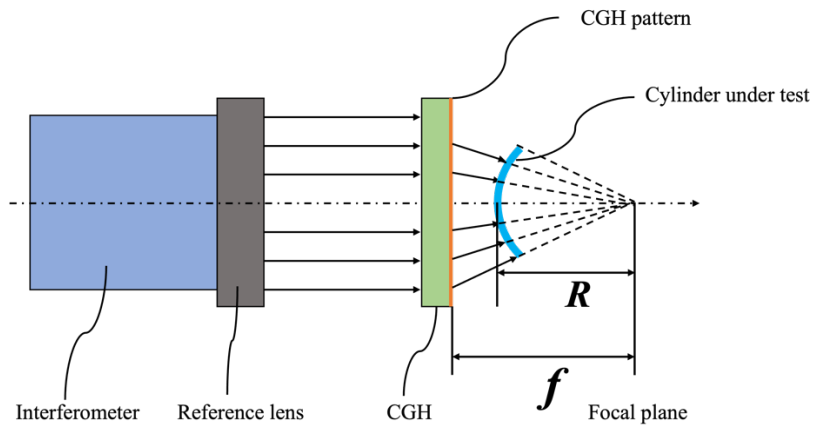


Figure 9: Diagram of optical path for testing convex cylinder lens

11. Adjust the clock degree to compensate the astigmatism. Test the cylinder lens with in cartesian coordinate. If your analyzing software is Metropro, click the “Load data” button and Right click on the mouse to get the mode-cylinder interface as shown in Figure 10.

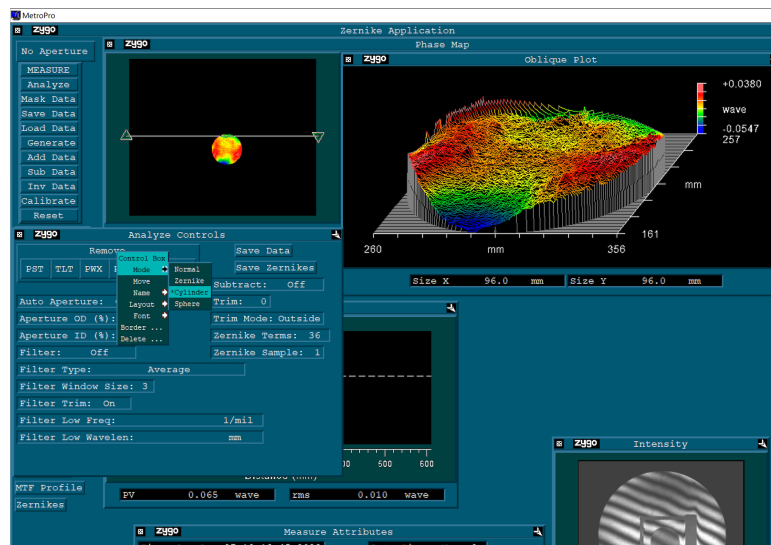


Figure10: Analyze mode for cylinder in Metropro

Remove the first five items in the aberration as shown in Figure 11

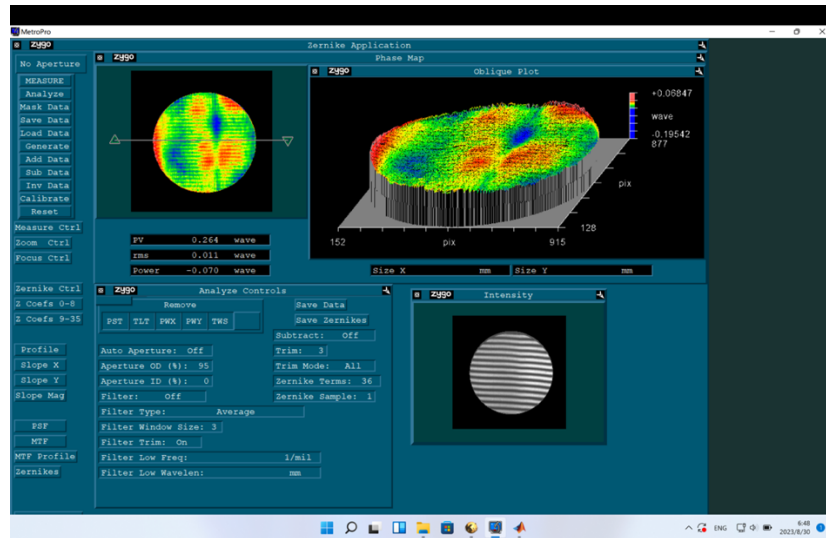


Figure 11: Analyze method for cylinder in MetroPro

If your analyzing software is MX, Load the “AsphereForm.appx” application, choose Cartesian coordinate as shown in Figure 12:

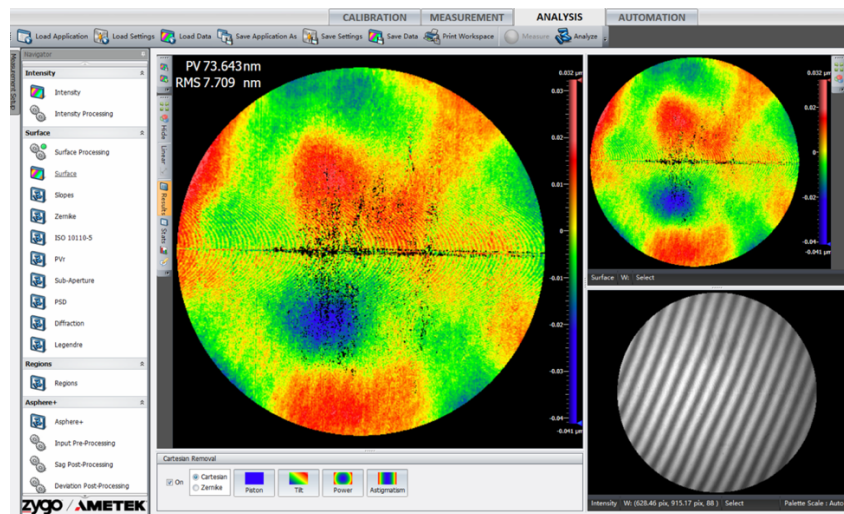


Figure12: Analyze mode for cylinder in MX

Remove four items in the aberration as shown in Figure 12.

Attachment 1: Cylinder CGH list

Explanation of Model Naming Rules ZX-ABCD

A: size of cylinder CGH

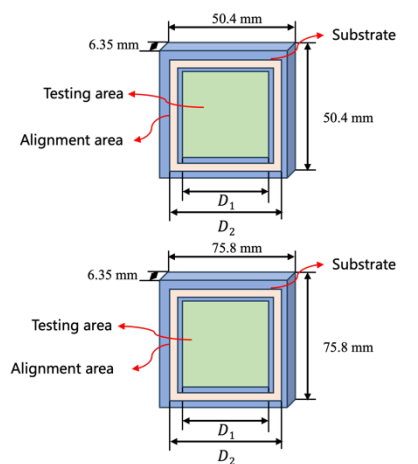
BCD: F# of cylinder CGH

Example1: ZX4200 represents the null patter size is 4 inch and the F# is 2

Example2: ZX6100 represents the null patter size is 6 inch and the F# is 1

Different models of cylinder CGH are listed below

Key parameters list of 2 inch & 3 inch cylinder CGH

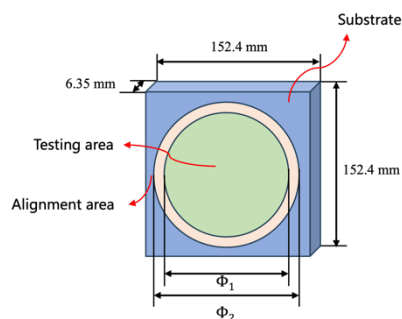


CGH key dimensions (2 inch & 3 inch)

Interferometer size	Model	Fno	Testing area size D ₁ /mm	Full aperture size D ₂ /mm	Focal length f/mm
4 inch 及以上	ZX2070	0.7	38	45	18.61
	ZX2100	1.0	38	45	32.91
	ZX2150	1.5	38	45	53.74
	ZX2200	2.0	38	45	73.59
	ZX2300	3.0	38	45	112.41
	ZX2400	4.0	38	45	150.81
	ZX2500	5.0	38	45	189.05
	ZX2600	6.0	38	45	227.21
4 inch 及以上	ZX21000	10.0	38	45	379.52
	ZX3070	0.7	60	67	29.39
	ZX3100	1.0	60	67	51.96
	ZX3150	1.5	60	67	84.85
	ZX3200	2.0	60	67	116.19
	ZX3300	3.0	60	67	177.48
	ZX3400	4.0	60	67	238.12
	ZX3500	5.0	60	67	298.50
	ZX3600	6.0	60	67	358.75
	ZX31000	10.0	60	67	599.25

List of 2-inch and 3-inch models

Key parameters list of 4 inch & 6 inch cylinder CGH



CGH key dimensions (2 inch & 3 inch)

Interferometer size	Model	Fno	Testing area size D ₁ /mm	Full aperture size D ₂ /mm	Focal length f/mm
4 inch 及以上	ZX4070	0.7	95	102	46.54
	ZX4100	1.0	95	102	82.27
	ZX4150	1.5	95	102	134.35
	ZX4200	2.0	95	102	183.97
	ZX4300	3.0	95	102	281.01
	ZX4400	4.0	95	102	377.02
	ZX4500	5.0	95	102	472.62
	ZX4600	6.0	95	102	568.02
	ZX41000	10.0	95	102	948.81
6 inch	ZX6070	0.7	140	148	68.58
	ZX6100	1.0	140	148	121.24
	ZX6150	1.5	140	148	197.99
	ZX6200	2.0	140	148	271.11
	ZX6300	3.0	140	148	414.13
	ZX6400	4.0	140	148	555.61
	ZX6500	5.0	140	148	696.49
	ZX6600	6.0	140	148	837.08
	ZX61000	10.0	140	148	1398.24

List of 2-inch and 3-inch models

Attachment 2:

Testing result of transmission wavefront and diffraction wavefront

● Transmission wavefront

The testing method for transmission wavefront is shown in figure 1

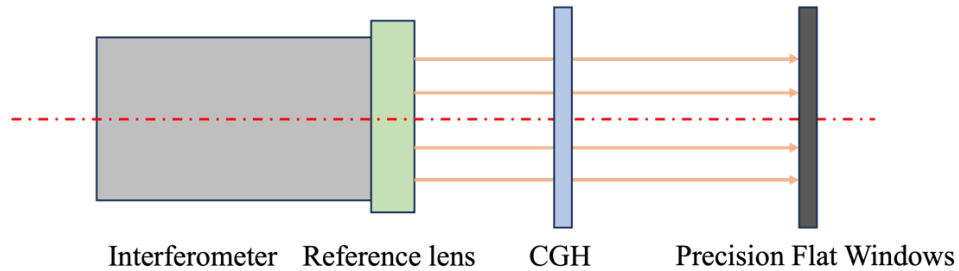


Figure 1: Diagram of transmission wavefront testing

The testing steps are as follows

Step1: install the TF lens on interferometer

Step2: adjust the positioning of reflective mirror to null fringe

Step3: insert CGH between interferometer and reflective mirror with a tilt angle

Step4: click the measure button

The testing result is as illustrated in Figure 2, The transmission wavefront is smaller than $1/100 \lambda$

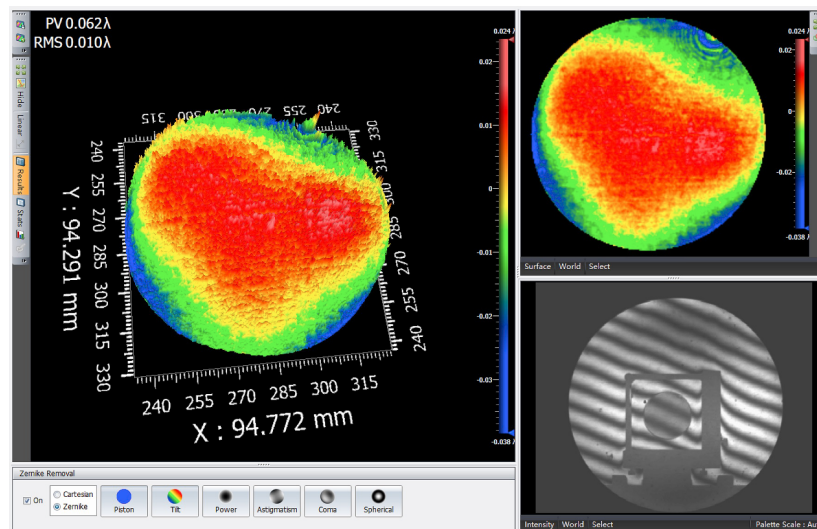


Figure 2: Testing result of transmission wavefront

● Diffraction wavefront

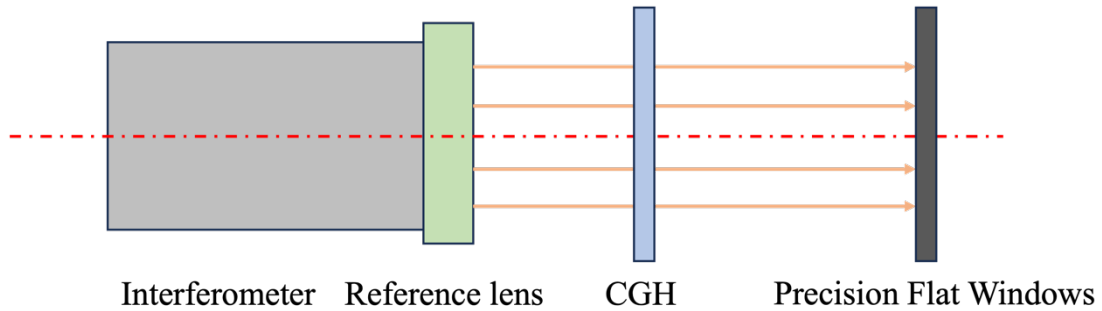


Figure 3: Diagram of diffraction wavefront testing

The testing steps are as follows

Step1: install the TF lens on interferometer

Step2: insert CGH and adjust it to null fringe

Step3: put a high-accuracy flat mirror at the focal plan

Step4: adjust the mirror positioning to null fringe

Step5: measure with Cartesian coordinate

The testing result is as illustrated in Figure 24 The diffraction wavefront is smaller than $1/100 \lambda$

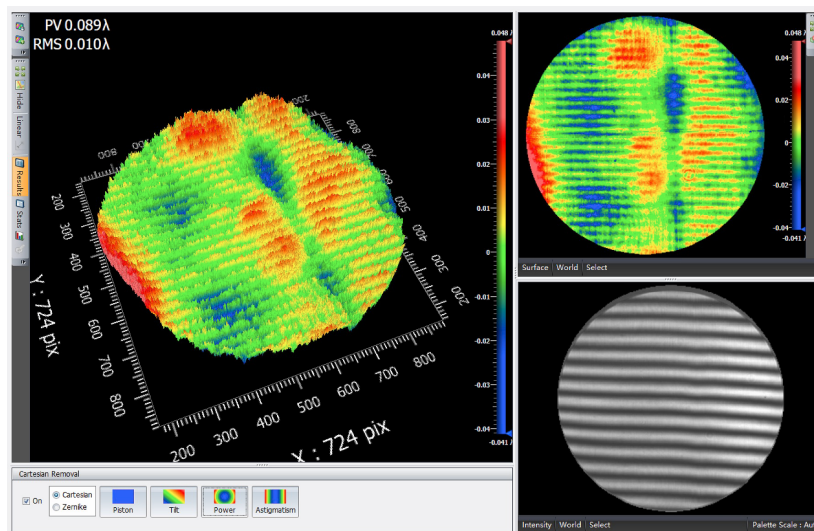


Figure 4: Testing result of diffraction wavefront