

## Instructions for use of the Cylindrical CGH Selection Tool

### ■ Selection site

<http://www.zhixingoptics.com/xuanxing>

### Selection interface

Entering the URL displays the interface as in Figure 1, which has two windows.

The blue box on the left is the selection window, whose main function is to input the parameters of the cylindrical surface, including the R value, concave and convex (Type, which can be toggled down to Concave and Convex), shape (Shape, which can be toggled down to Square and Circle and Ellipse), and size of the dimensions;

The yellow box on the right is the viewing window, mainly to view our models for sale and the spot coverage of the asphere to be tested.

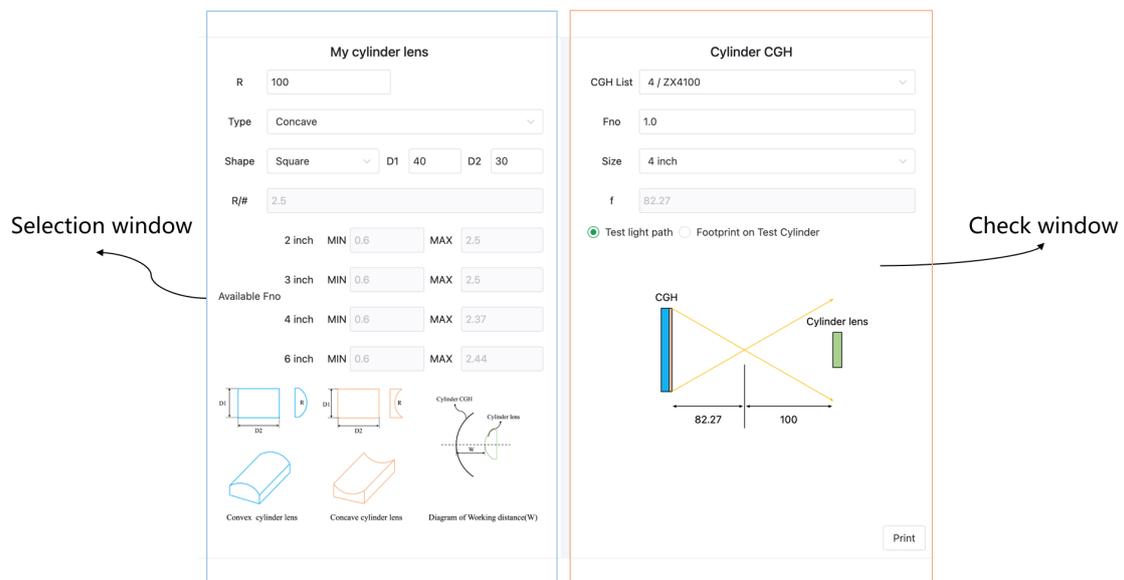


Figure 1: Overall interface diagram of the selection tool

### ■ Selection Window

One of the blue boxes on the left is the selection window, which has two main

functions:

### Function 1: Input the parameters related to the cylindrical lens

**R:** radius of curvature of the cylindrical lens, the input value is absolute;

**Type:** Concave and Convex can be selected;

**Shape:** you can choose the shape of the cylindrical lens (rectangle and ellipse, where square and circle are two special forms of rectangle and ellipse);

**D1:** Caliber with curvature direction;

**D2:** Caliber without curvature direction;

**R/#:** F/# of the cylindrical lens, **this item can not be input, it is calculated automatically;**

**W:** When Convex is selected for Type, you need to input the working distance (axial distance of CGH from the vertex of the cylindrical surface), and it is recommended that the distance be set to 10 mm or more in consideration of detection safety.

### Function 2: Output the recommended Fno range for different sizes

When the input of the relevant parameters of the cylindrical lens is completed, the suggested Fno ranges for different sizes will be output. If the parameters of the cylindrical lens to be inspected in the selection box of Fig. 1 are input, the selection software will output the suggested Fno ranges as in Fig. 2:

For 2 inch, the display of none indicates that there are no models available for 2 inch, where 3inch/4 inch/6 inch have models that can be covered;

For 3 inch, Fno ranges from 0.85 to 2.5. Upon checking the table in annex 1,

there are three models available for 3 inch, ZX3100, ZX3150, and ZX3200;

For 4 inch, Fno ranges from 0.85 to 2.26. Upon checking the annex 1 table,

there are three models available for 4 inch, ZX4100, ZX4150, and ZX4200;

For 6 inch, Fno ranges from 0.85 to 2.39. Upon checking the table in annex 1,

there are three models available for 6 inch, ZX6100, ZX6150, and ZX6200.

Available Fno	2 inch	MIN	<input type="text" value="none"/>	MAX	<input type="text" value="none"/>
	3 inch	MIN	<input type="text" value="0.85"/>	MAX	<input type="text" value="2.5"/>
	4 inch	MIN	<input type="text" value="0.85"/>	MAX	<input type="text" value="2.26"/>
	6 inch	MIN	<input type="text" value="0.85"/>	MAX	<input type="text" value="2.39"/>

**Figure 2:** Suggested model selection

The above shows the selection of concave surface, the same parameters of the cylindrical surface, if it becomes convex surface, the selection interface is as follows, W is the minimum distance of the CGH graphic surface from the vertex of the convex surface (more than 10 mm is recommended);

**My cylinder lens**

R

Type  W

Shape  D1  D2

R/#

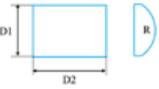
2 inch MIN  MAX

3 inch MIN  MAX

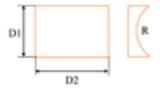
4 inch MIN  MAX

6 inch MIN  MAX

Available Fno



Convex cylinder lens



Concave cylinder lens

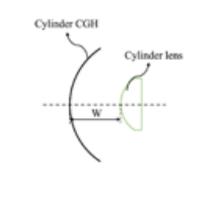


Diagram of Working distance(W)

**Min. working distance**

**Figure 3: Raised-Face Selection Interface**

For 2 inch, none is displayed and no models are available for selection;

For 3 inch, Fno ranges from 1.9 to 2.5, and upon checking the annex 1 table, there is a model ZX3200 available for 3 inch;

For 4 inch, Fno ranges from 1.26 to 2.26. After checking the table in annex 1, two models are available for 4 inch, ZX4150 and ZX4200;

For 6 inch, Fno ranges from 0.93 to 2.39. Upon checking the table in annex 1, three models are available for 6 inch, ZX6100, ZX6150, and ZX6200.

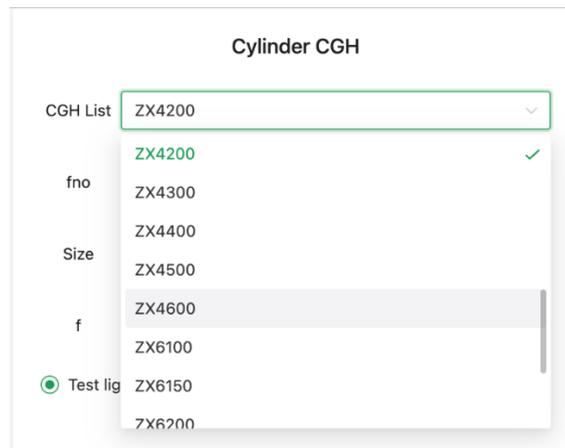
## ■ Check Window

The yellow box on the right is the viewing window, which has two main

functions:

**Function 1: Select an existing model according to the recommended Fno range on the left for viewing.**

In this example, let's take ZX4200 as an example, drop down the CGH list and select ZX4200, then fno/Size/f will be calculated automatically.



**Figure 4: Model drop-down window**

Two graphs can be viewed:

The optical path diagram (with distance information) is shown in Figure 5:

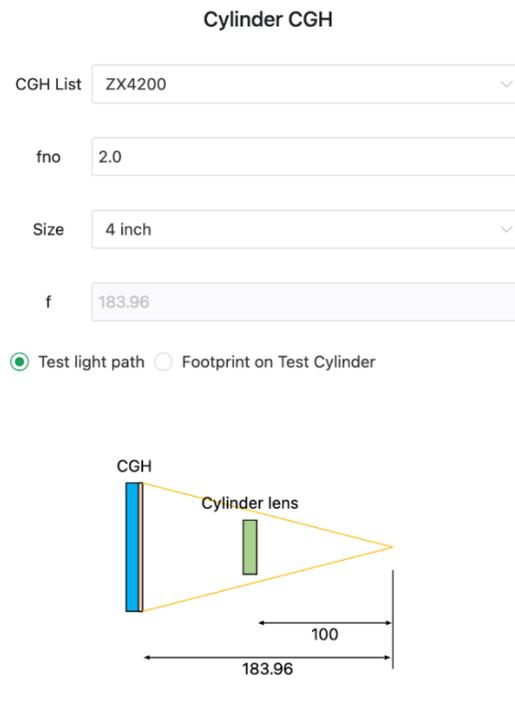
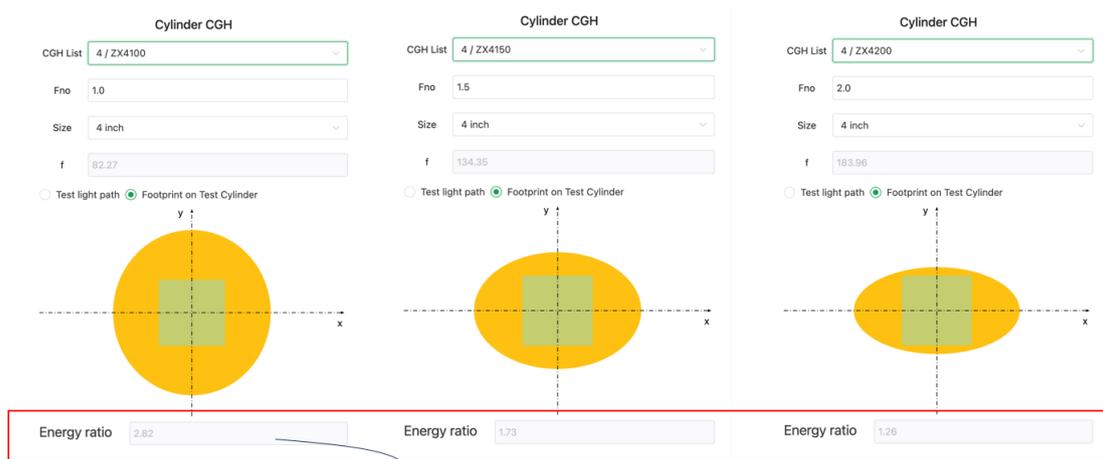


Figure 5: Test optical path diagram

For the concave surface in Figure 1, 4-inch cylindrical CGH can be selected from the three models (ZX4100, ZX4150, ZX4200) spot coverage as shown in Figure 6, the bottom will be given an Energy ratio of the proportion of the value greater than 1, greater than 1 the smaller the case, the detection of the more pixels available, the higher the resolution of the relative resolution, for such as the above three models. For the three models above, the ZX4200 corresponds to the smallest Energy ratio ratio (1.26), which results in a higher detection resolution compared to the other two models.

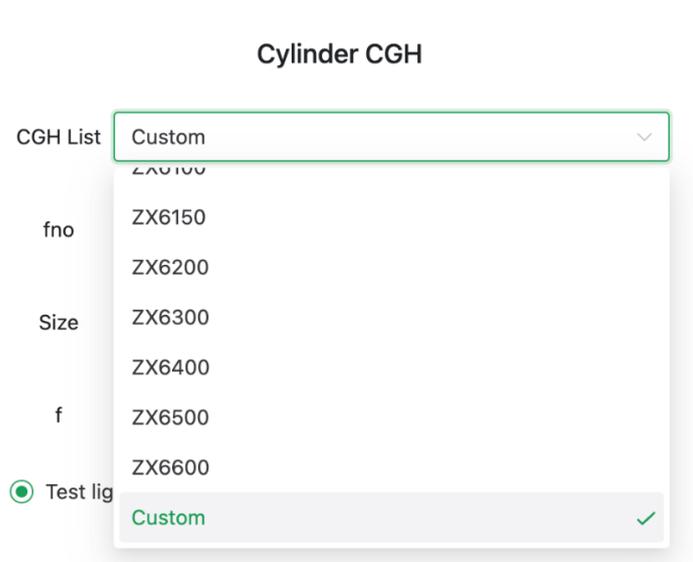


Energy ratio (greater than 1, smaller is better)

**Figure 6:** Spot coverage map

### Function 2: Customized models for viewing

When the model suggested on the left side is beyond our product model list, such as the suggested selection Fno between 4.3-4.6, the company does not have Fno in this range, then you need to customize it, select Custom in the cylindrical of CGH list, as shown in Figure 7:

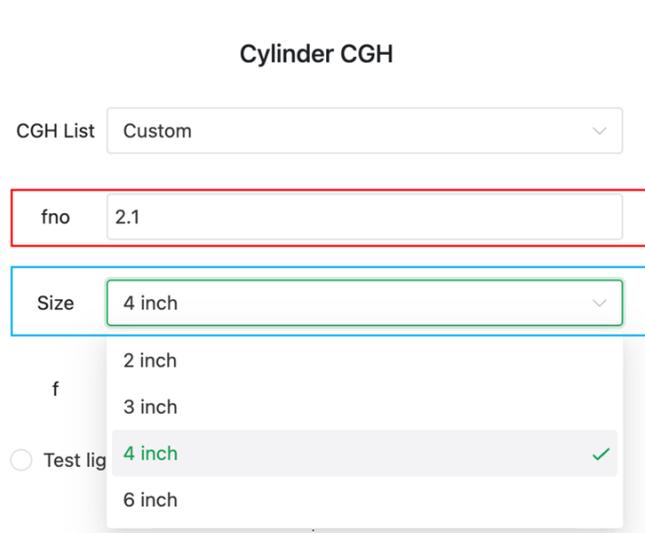


**Figure 7:** Selecting a customized model

Enter Fno inside the red box and select the model number in the blue box, e.g.

in this case the recommended 4-inch Fno range [1.35 2.37] can be defined as

fno=2.1



**Cylinder CGH**

CGH List Custom

fno 2.1

Size 4 inch

f

2 inch

3 inch

4 inch ✓

6 inch

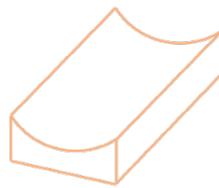
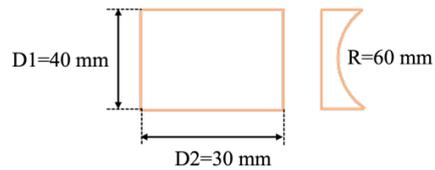
Test lig

**Figure 8:** Example of a customized window input item

Depending on the customized model, you can view the optical path diagram and spot coverage diagram to determine whether the cylindrical lens can be detected by the customized model.

**Example 1:**

The parameters of the cylindrical lens are shown in Figure 1:  $D1 = 40\text{ mm}$ ,  $D2 = 30\text{ mm}$ ,  $R = 60\text{ mm}$ , rectangular.



Concave cylinder lens

**Fig. 1:** Schematic of concave parameters

According to the above parameters, enter the relevant parameters ( $R$ , type,  $D1$ ,  $D2$ , Shape) into the red box of the selection web page, as shown in Figure 2, and the tool will automatically calculate the available interval of  $Fno$  for the corresponding model (green box):

**My cylinder lens**

R

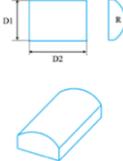
Type

Shape  D1  D2

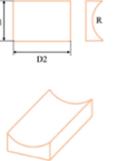
R/#

Available Fno

2 inch	MIN	<input type="text" value="0.85"/>	MAX	<input type="text" value="1.5"/>
3 inch	MIN	<input type="text" value="0.85"/>	MAX	<input type="text" value="1.5"/>
4 inch	MIN	<input type="text" value="0.85"/>	MAX	<input type="text" value="1.42"/>
6 inch	MIN	<input type="text" value="0.85"/>	MAX	<input type="text" value="1.46"/>



Convex cylinder lens



Concave cylinder lens

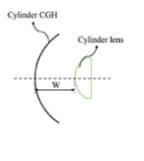


Diagram of Working distance(W)

**Fig. 2:** Parameter input and Fno calculation output

There are six models that can be used based on the recommendations in the green box above (see table in annex 1).

**2-inch:** ZX2100, ZX2150

**3-inch:** ZX3100, ZX3150

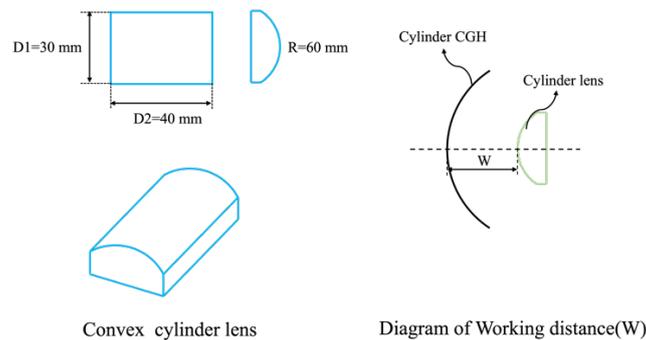
**4-inch:** ZX4100

**6-inch:** ZX6100

**Example 2:**

The parameters of the cylindrical lens are as follows:  $D1 = 30$  mm,  $D2 = 40$  mm,  $R = 60$  mm, rectangular.

Determine  $W$  (distance of CGH rear surface from the apex of the cylindrical) according to the actual light path of the customer.



**Fig. 1:** Schematic diagram of convex surface parameters

According to the above parameters, enter the relevant parameters ( $R$ , type,  $D1$ ,  $D2$ , Shape,  $W$ ) into the red box of the selection webpage, as shown in Figure 2, and the tool will automatically calculate the available interval of  $Fno$  for the corresponding model (green box):

**My cylinder lens**

R

Type  W

Shape  D1  D2

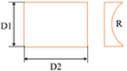
R/#

Available Fno

2 inch	MIN	<input type="text" value="none"/>	MAX	<input type="text" value="none"/>
3 inch	MIN	<input type="text" value="1.42"/>	MAX	<input type="text" value="2"/>
4 inch	MIN	<input type="text" value="0.97"/>	MAX	<input type="text" value="1.81"/>
6 inch	MIN	<input type="text" value="0.75"/>	MAX	<input type="text" value="1.91"/>



Convex cylinder lens



Concave cylinder lens

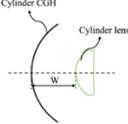


Diagram of Working distance(W)

**Fig. 2:** Input of convex parameters and output of Fno calculation

There are six models that can be used based on the recommendations in the green box above (see table in annex 1).

**2-inch:** none

**3-inch:** ZX3150, ZX3200

**4-inch:** ZX4100, ZX4150,

**6-inch:** ZX6100, ZX6150,

## Appendix 1: List of Cylindrical CGH Models

Model naming instructions ZX-ABCD:

**A:** represents the size of the cylindrical surface CGH

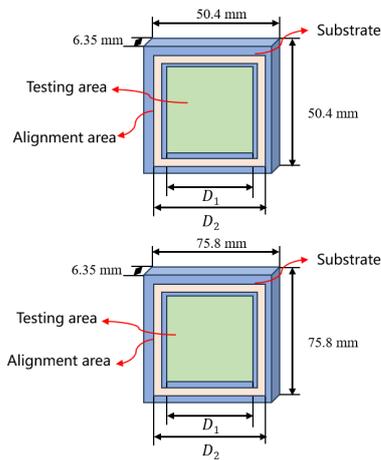
**BCD:** represents the cylindrical surface CGH Fno

**Example 1:** ZX4200 Model: 4-inch Fno: 2.0

**Example 2:** ZX6100 Model: 6-inch Fno: 1.0

A list of the different sizes of CGH models is shown below:

**Table 1: 2-inch & 3-inch Cylindrical CGH Key Parameters Table**

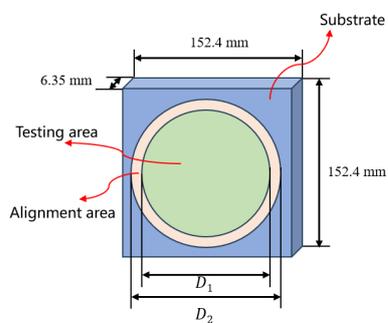


CGH key dimensions (2 inch & 3 inch)

Interferometer size	Model	Fno	Testing area size D1/mm	Full aperture size D2/mm	Focal length f/mm
4 inch and larger	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 and larger	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

**Table 2: 4-inch & 6-inch Cylindrical CGH Key Parameters Table**



CGH key dimensions (4 inch & 6 inch)

Interferometer size	Model	Fno	Testing area size D1/mm	Full aperture size D2/mm	Focal length f/mm
4 inch and larger	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
6 inch	ZX41000	10.0	95	102	948.81
	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 4-inch and 6-inch models