

Learn ZWCAD Mechanical in a Day

Contents

Learn ZWCAD Mechanical in a Day.....	0
1. Basic drawing, dimension, and symbols	1
1.1. Set frame to A3 and 1:1	1
1.2. Drawing a contour	1
1.2.1. Draw the contour of a part through hole and shaft design	1
1.2.2. Two methods to draw a hole.....	3
1.2.3. Draw a chamfer	4
1.2.4. Draw a projection	6
1.2.5. Draw a hole array	7
1.3. Dimension	8
1.3.1. Dimension.....	8
1.3.2. Symbol Dimension	11
1.3.3. View Dimension	13
2. Operational procedure of ZWCAD MECHANISM	14
2.1. Fill in the title	14
2.2. Part Builder for drawing standard parts:	16
2.2.1. Draw basic graphics	16
2.2.2. Add standard fasteners for mechanism	16
2.3. Balloons dimension and fill out the BOM	18
2.3.1. Dimension the balloons.....	18
2.3.2. Fill in BOM	21
2.3.3. Generate BOM.....	23
2.4. Add technical requirements.....	24
3. Command/abbreviated command list.....	26

1. Basic drawing, dimension, and symbols

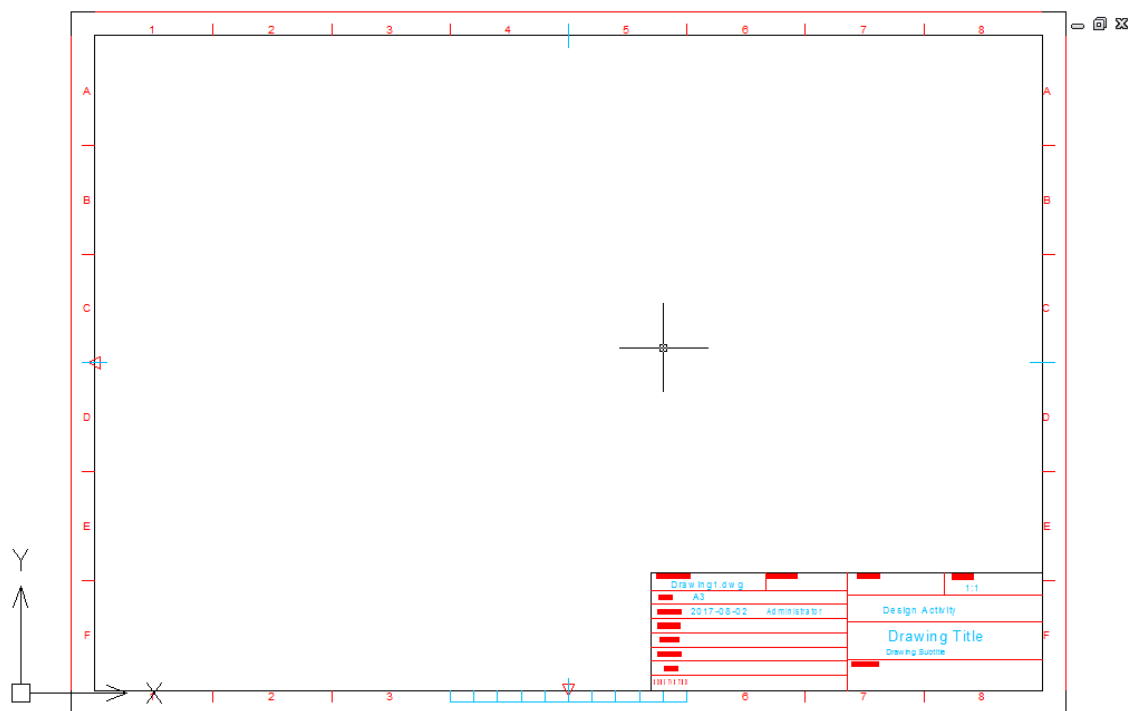
This manual introduces the basic drawing features of ZWCAD MECHANICAL to give users a general understanding of the drawing tools and dimensioning methods.

1.1. Set frame to A3 and 1:1

Click **Border Setup** or enter a **ZWMFRAMEINIT2** to bring up the dialog box of Frame Settings;

Select **A3** as frame size, and **1:1** as ratio, click **OK**, **Enter**

The Frame Settings are now done. The outcome is as follows:



1.2. Drawing a contour

1.2.1. Draw the contour of a part through hole and shaft design

Step 1:

Click **Shaft Generator** or enter **ZWMSHAFT**, Set the parameter as follows:

Shaft Design

Data list

1 part	Length= 15.00	Start diameter= 40.00	End diameter= 40.00
2 part	Length= 15.00	Start diameter= 80.00	End diameter= 80.00

Up Down Delete

Data input (modify)

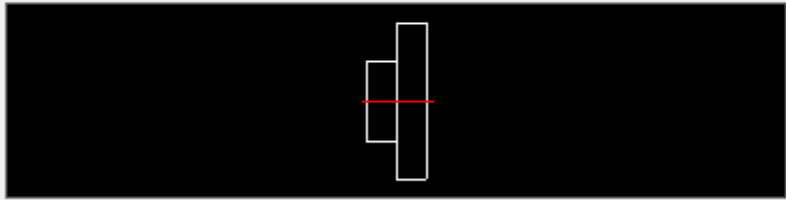
Selected Segment Length

Start diameter End diameter

☐ Chamfer * ☐ Undercut (b * t) *

☐ Keyway l * b * Add Modify

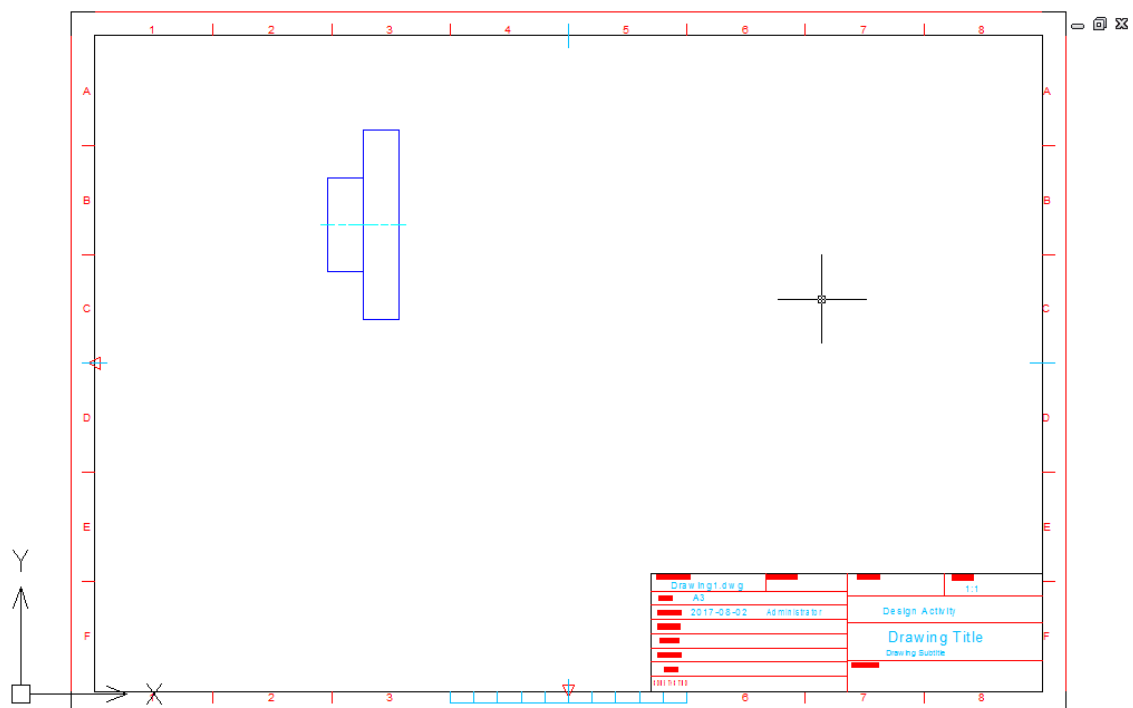
Preview



Save Load OK Cancel

Click **OK** to draw the newly designed shaft

Select an appropriate location in the drawing for the shaft, as shown:



1.2.2. Two methods to draw a hole

1. Draw a center hole:

Click **Hole Shaft Design** or input: **ZWMHOLEAXIS**;

Command: *_ZWMHOLEAXIS*

Input first point of hole or [Shaft/First diameter:100.00 /End diameter:100.00 /centerline extended Length:3.00 /Centerline:no]:f

Input start diameter:<100>20

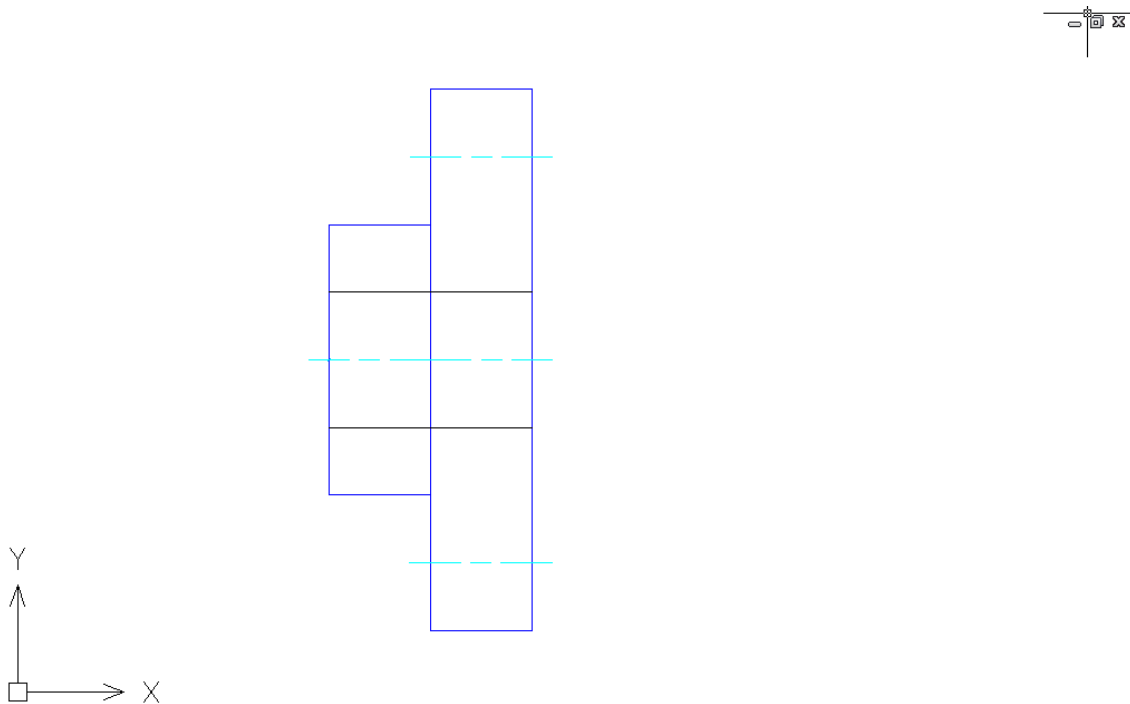
Input first point of hole or [Shaft/First diameter:10.00 /End diameter:10.00 /centerline extended Length:3.00 /Centerline:no]:<Pick the center point in the left side>

Specify next point or [Shaft/input Angle/First diameter:10.00 /End diameter:10.00 /centerline extended Length:3.00 /Centerline:no]:<Pick the center point in the right side>

Command:

2. Draw a hole around:

Offset the center line 30 to the above and below, and then **Break** the extra lines as follows:



Click **Mirror line** or input: **ZWMMIRRORLINE**;

Command: *ZWMMIRRORLINE*

Select Axis of symmetry

Line or[Arc/Circle/eXit]<X>:

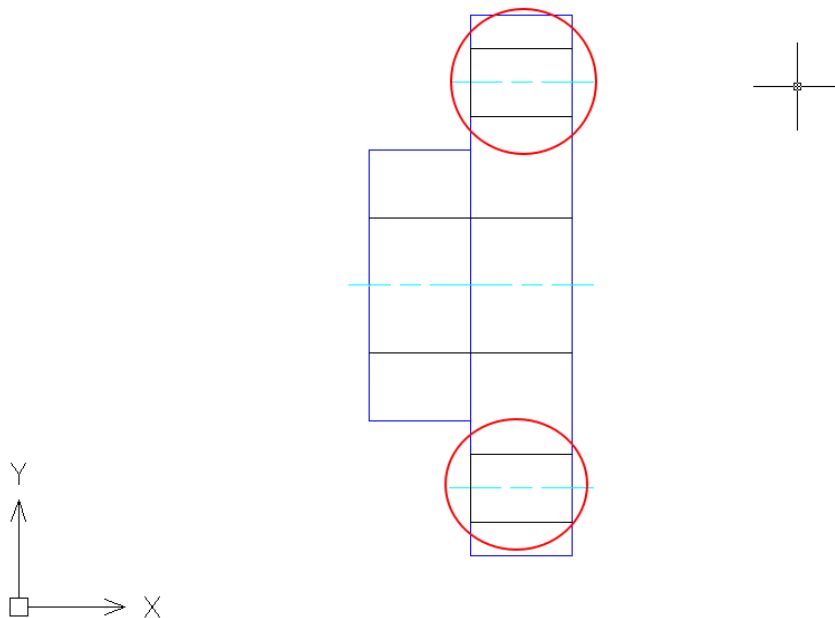
Next point:5

Next point:

Next point:

Line or[Arc/Circle/eXit]<X>:

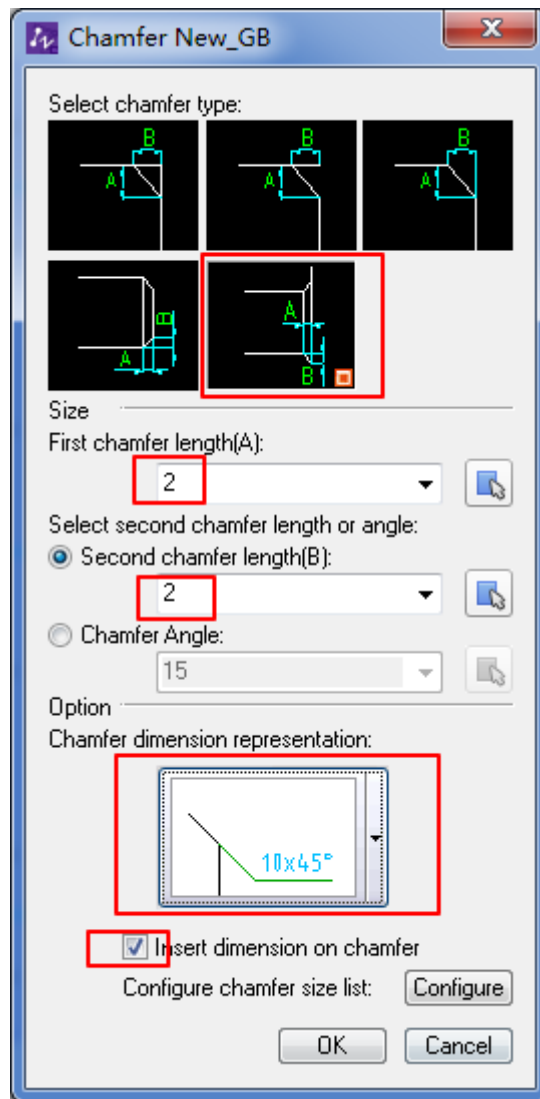
☐ ☐ ✕



1.2.3. Draw a chamfer

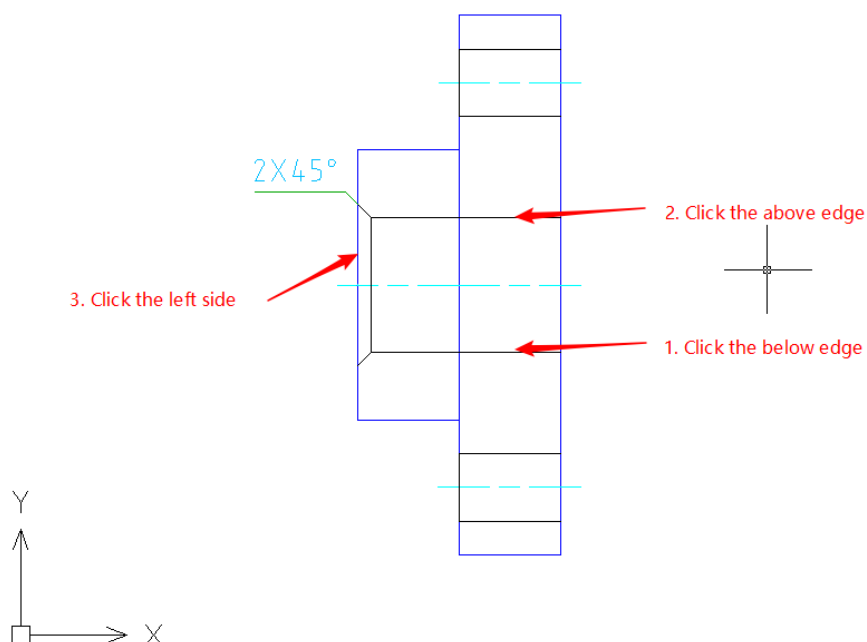
Click **Chamfer** or input: **ZWMFILLETLC**

Enter the **Setup** and set as follows:



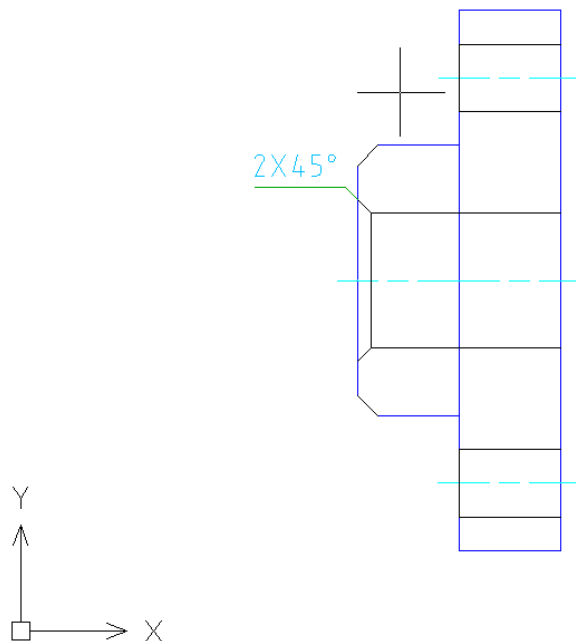
After setting, click **OK** to draw;

— □ ×



Do the same chamfer to other parts as follows, set the length as 3:

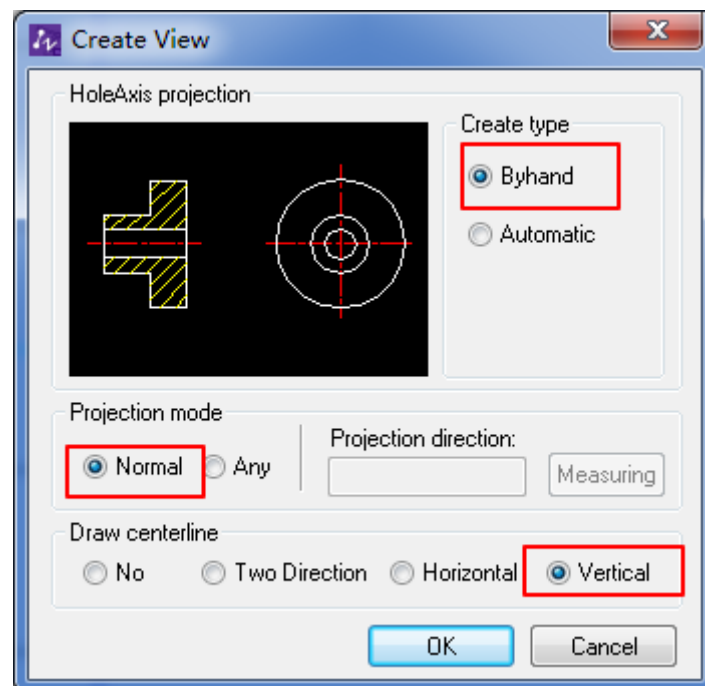
— @ X



1.2.4. Draw a projection

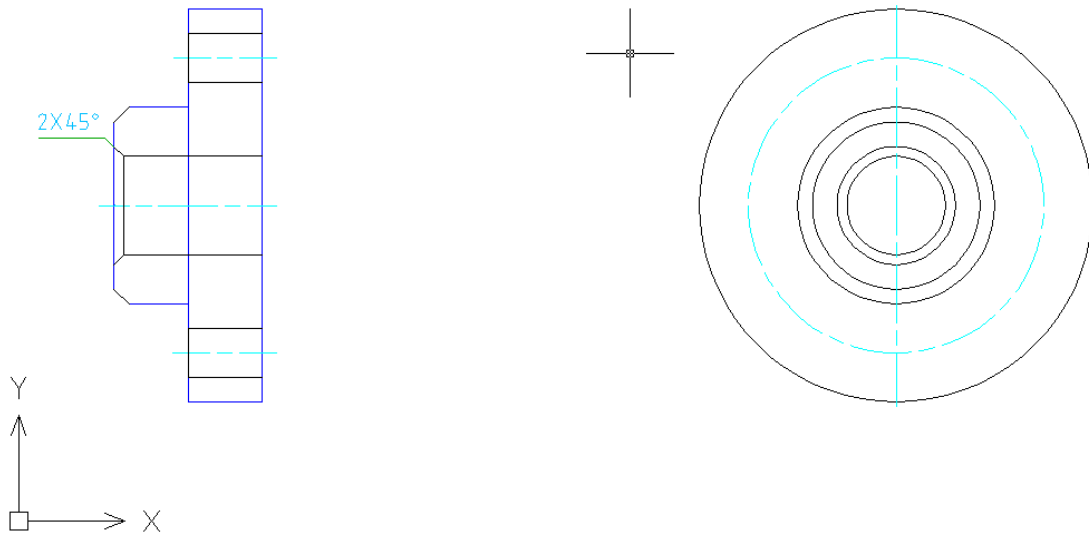
Click **Hole-Shaft Projector** or input: **ZWMHSPROJECTOR**

Set as follows:



According to the prompts in the command line, to select the center line, and the features points. After that, move the objects to a certain distance as follows:

Notice: Need to change one of the circle from Layer 0 to Layer AM_7

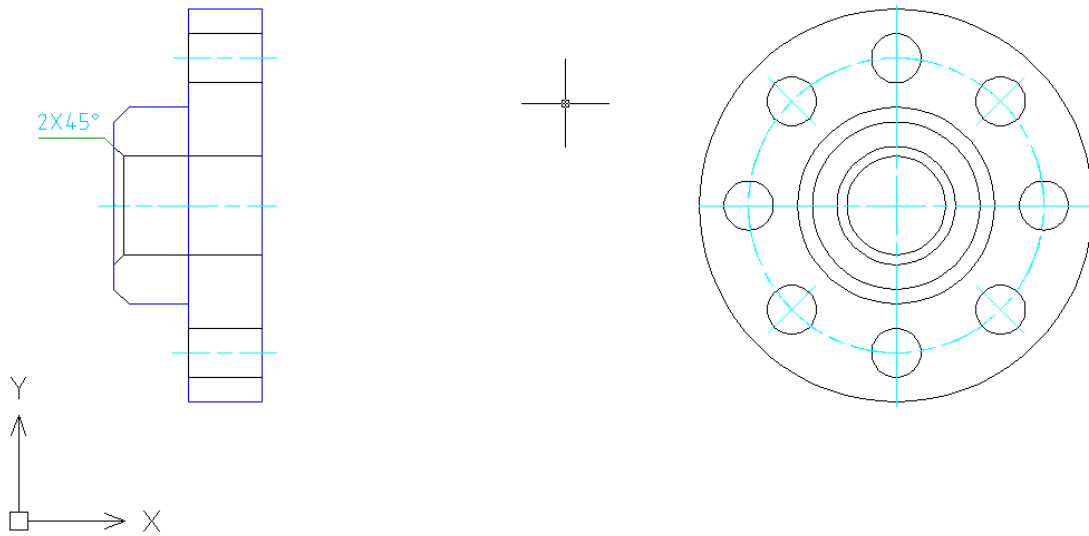


1.2.5. Draw a hole array

Click the **Hole Array** or input: **ZWMARRAYHOLE**, set as follows:



The result is as follows:

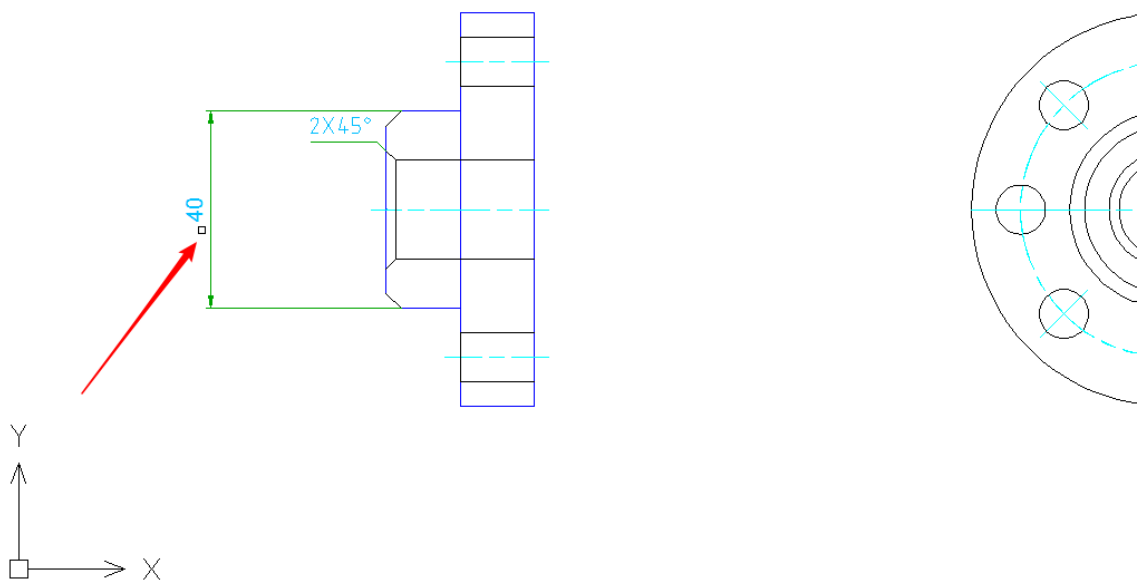


1.3. Dimension

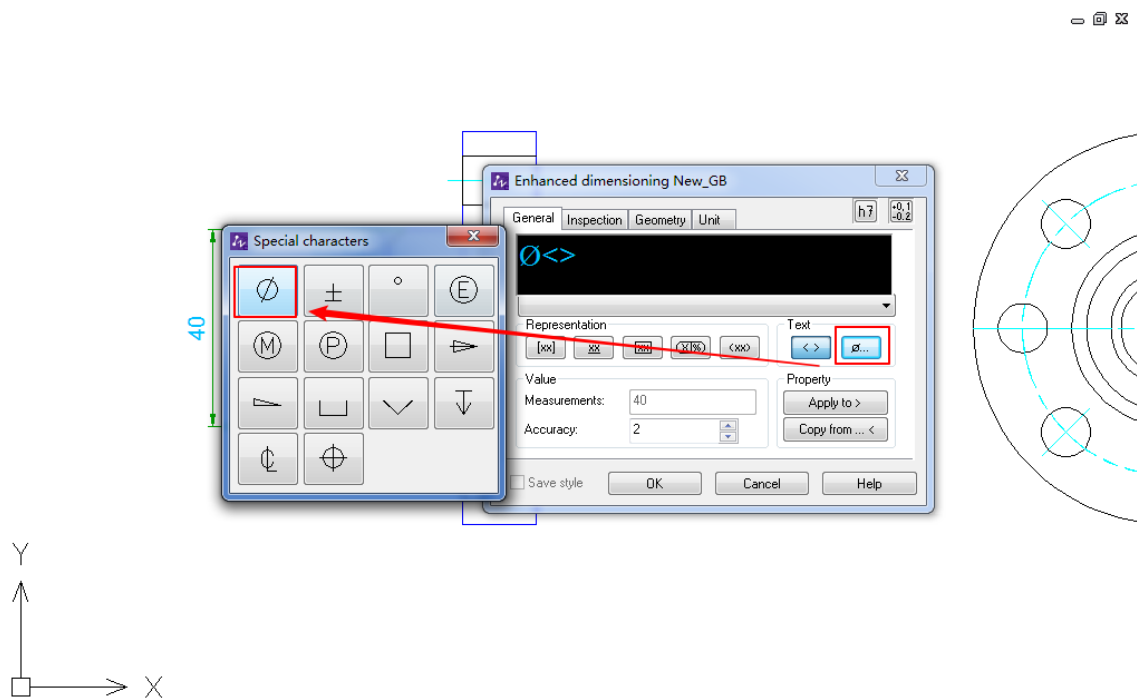
1.3.1. Dimension

Click **Power Dimension** or input **ZWMPowerDIM**

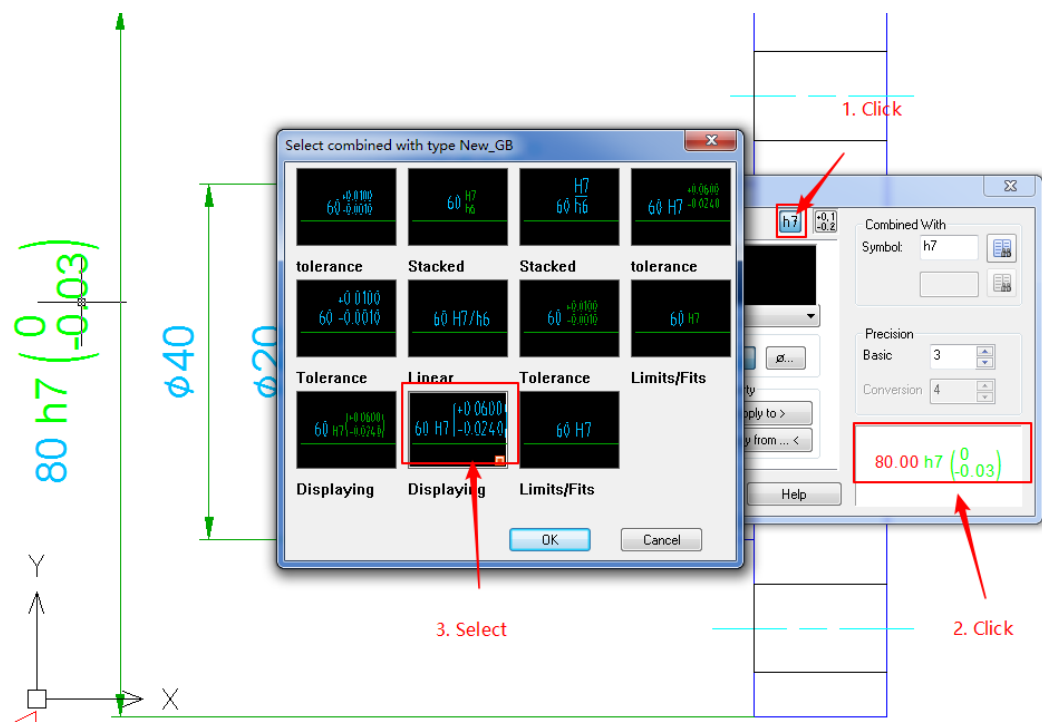
Select two points to dimension, and then Enter. When the cursor becomes a pick box, select the dimension, in this case, it is 40.



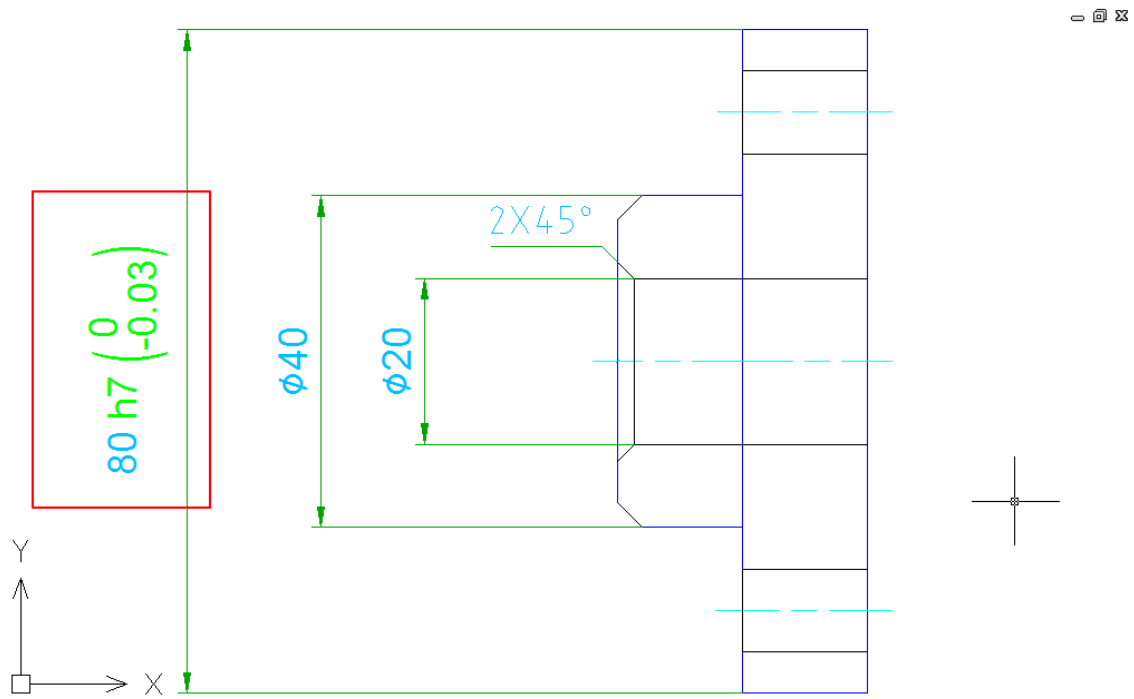
Then the Enhanced dimensioning box will prompts. Add the diameter symbol as follows.



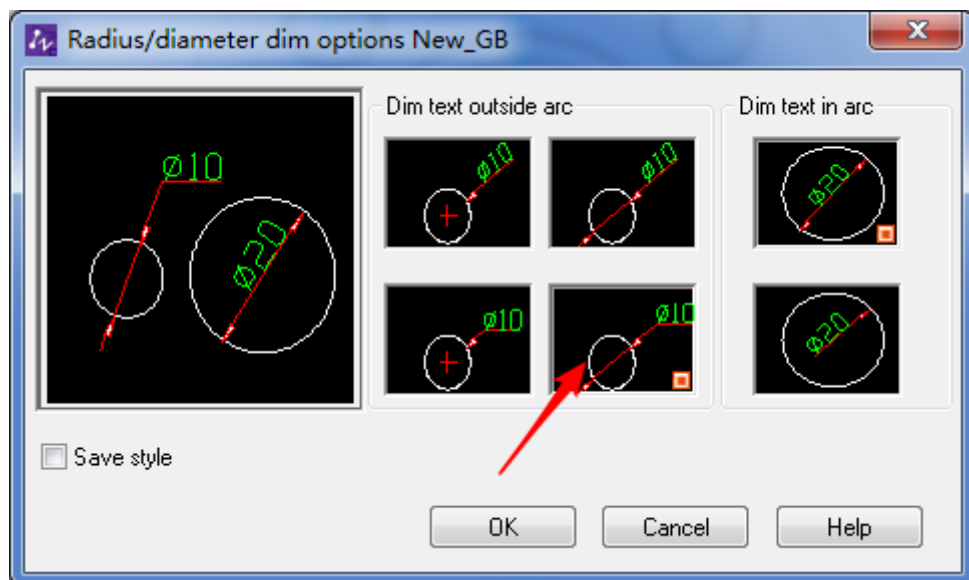
Proceed to dimension the edge contour of the part by adding tolerance to the dimension. Set as follows:



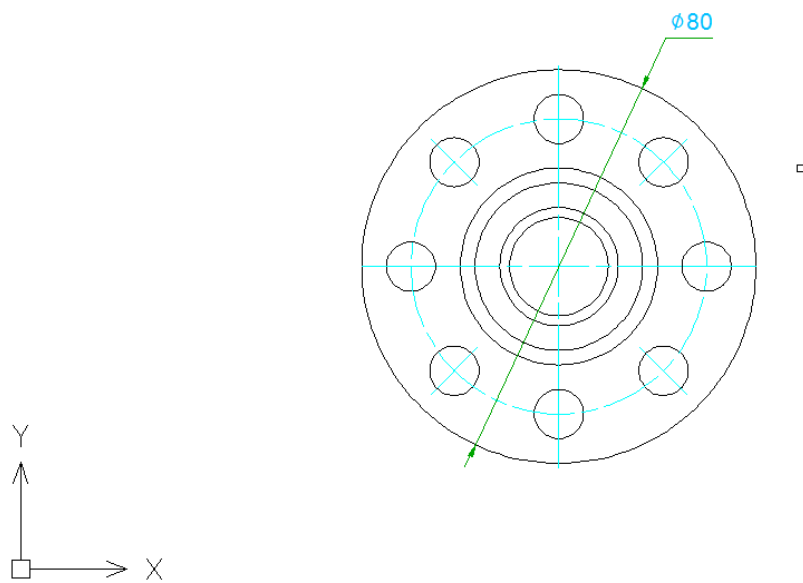
The result is as follows:



Proceed to dimension other areas of the part.



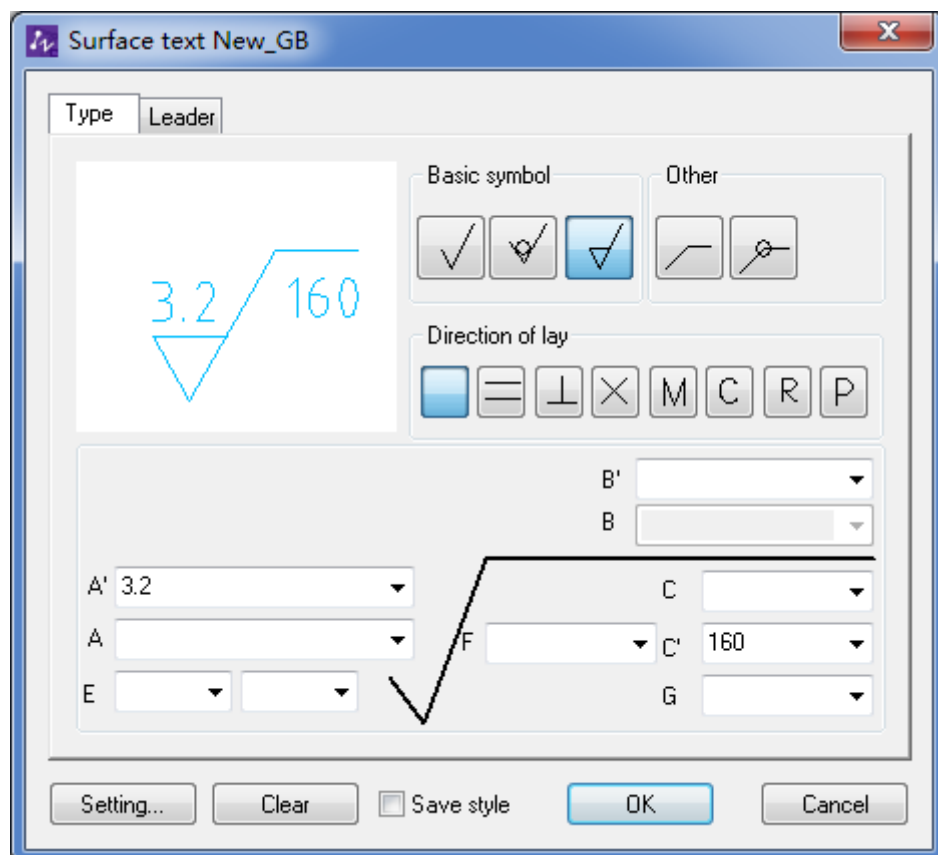
The result is as follows:



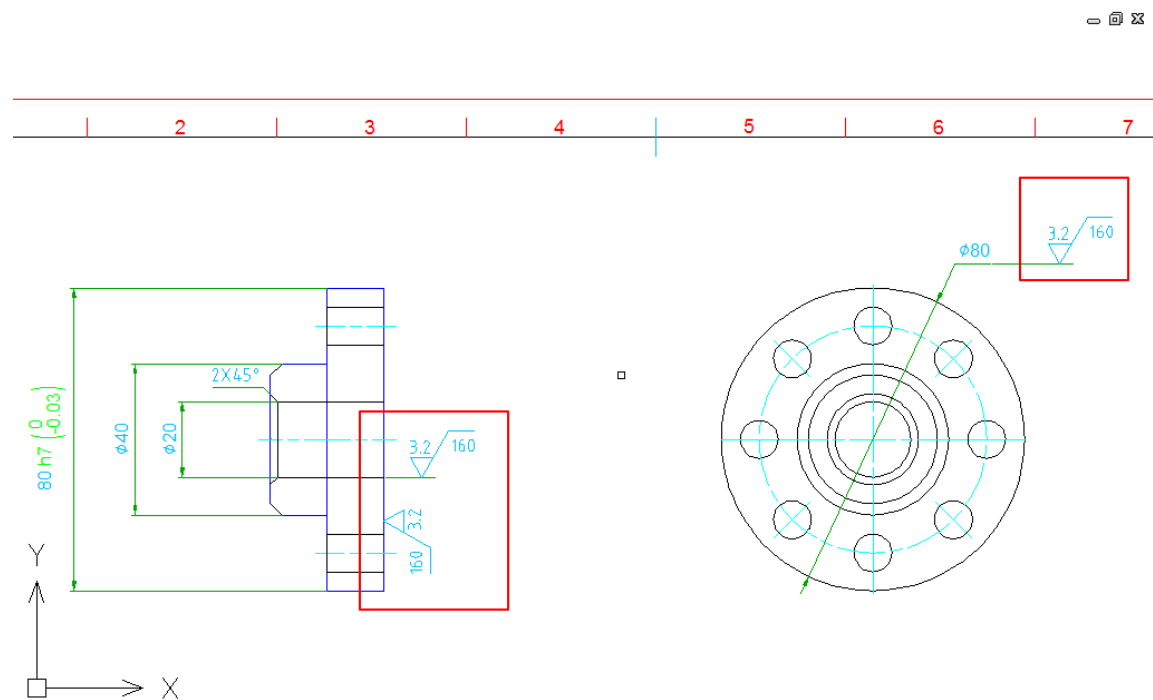
1.3.2. Symbol Dimension

Click **Surface Texture** or input **ZWMSURFSYM**

Set as follows

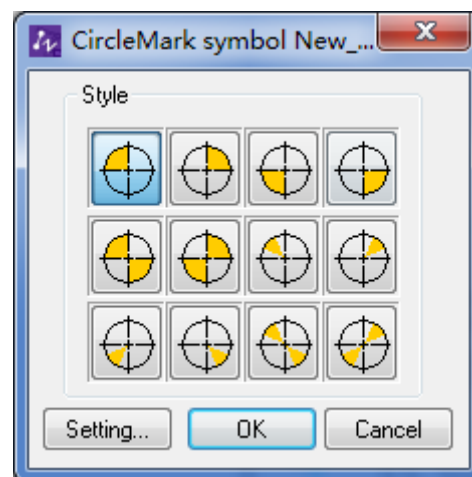


The result is:

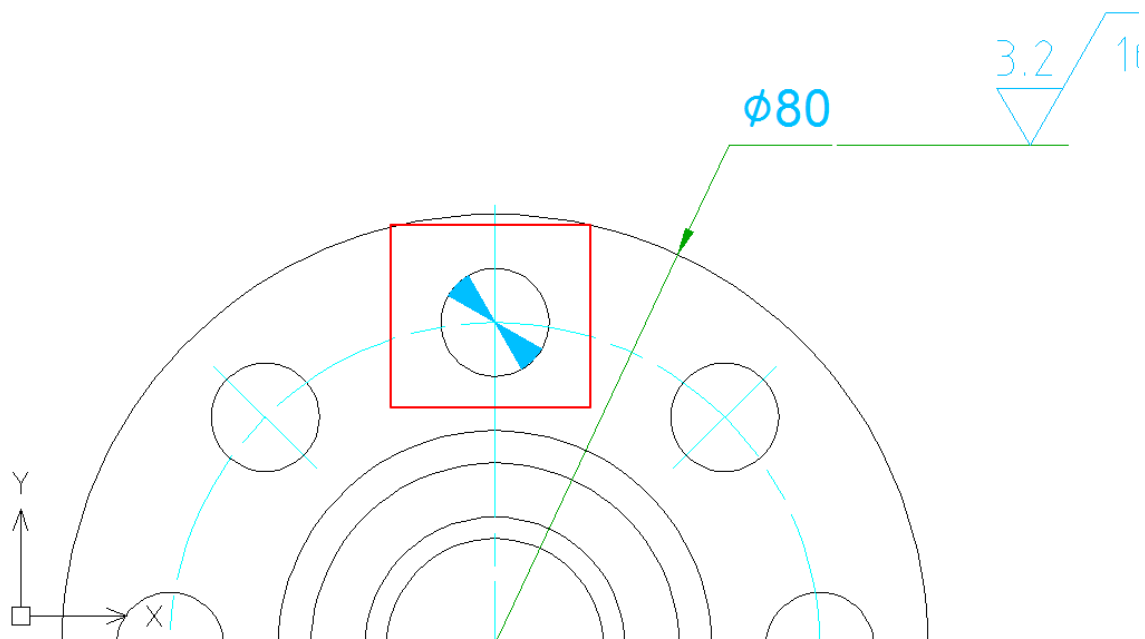


(2) Circlemark

Click **Circle Mark** or input **ZWMCIRCLEMARK**



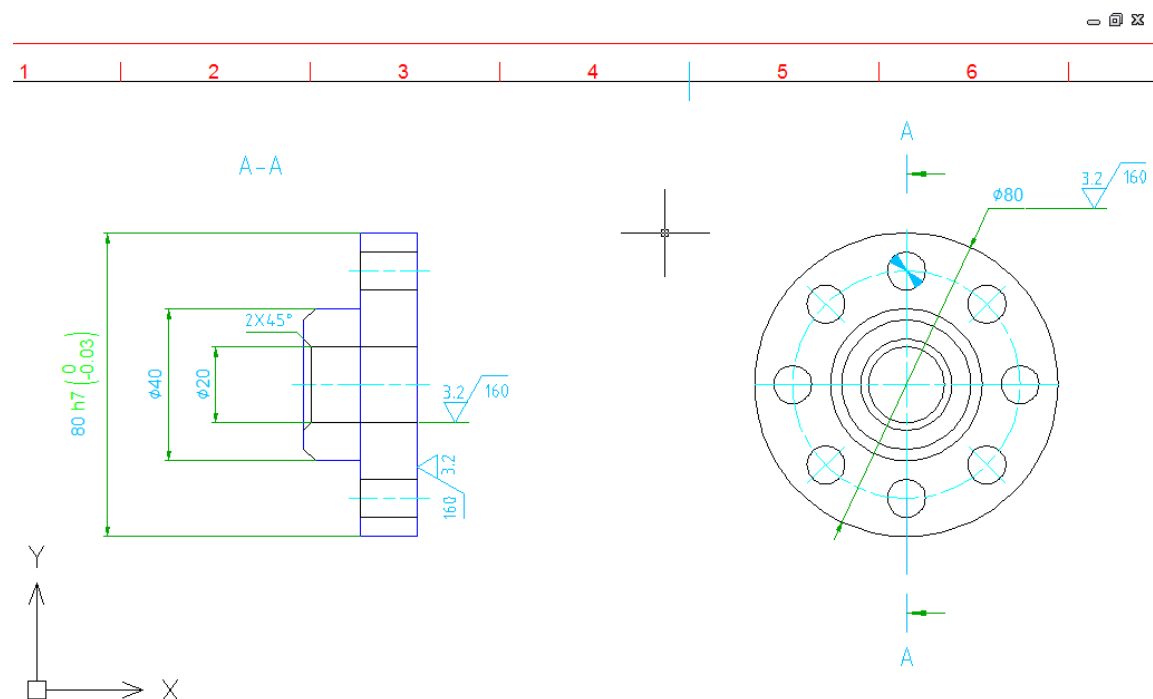
Select the desired circle mark, and click **OK**



1.3.3. View Dimension

Click **Section Line** or input **ZWMSECTIONLINE**

Directly pick the points and add the section line

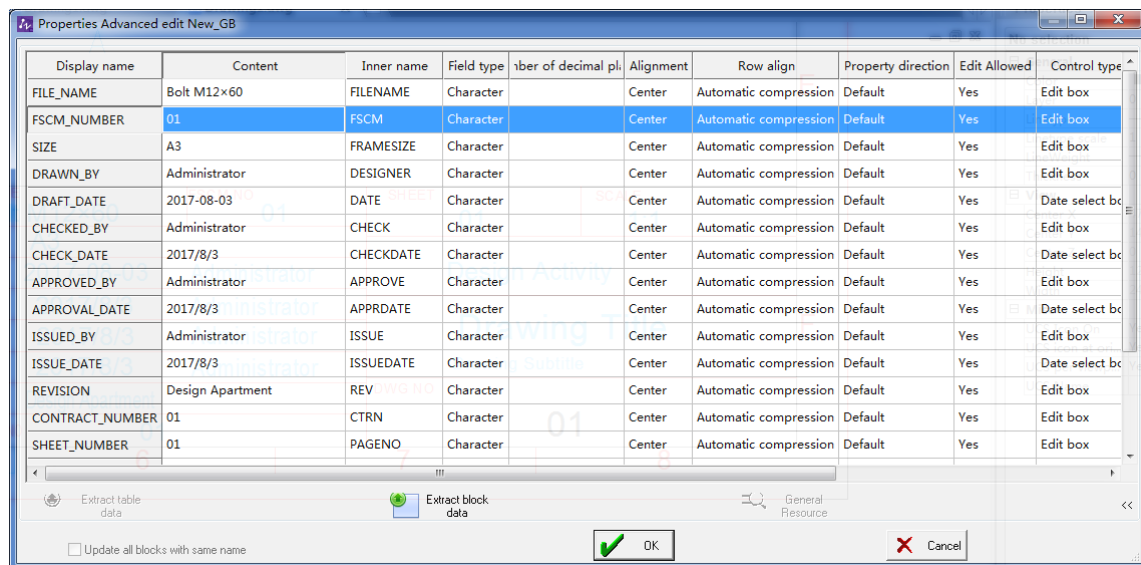


2. Operational procedure of ZWCAD MECHANISM

Here is the brief description of the general steps for users to mechanical designs with ZWCAD MECHANICAL and for them to develop an overall understanding of ZWCAD MECHANISM.

2.1. Fill in the title

Input: **ZWMTITLEEDIT**

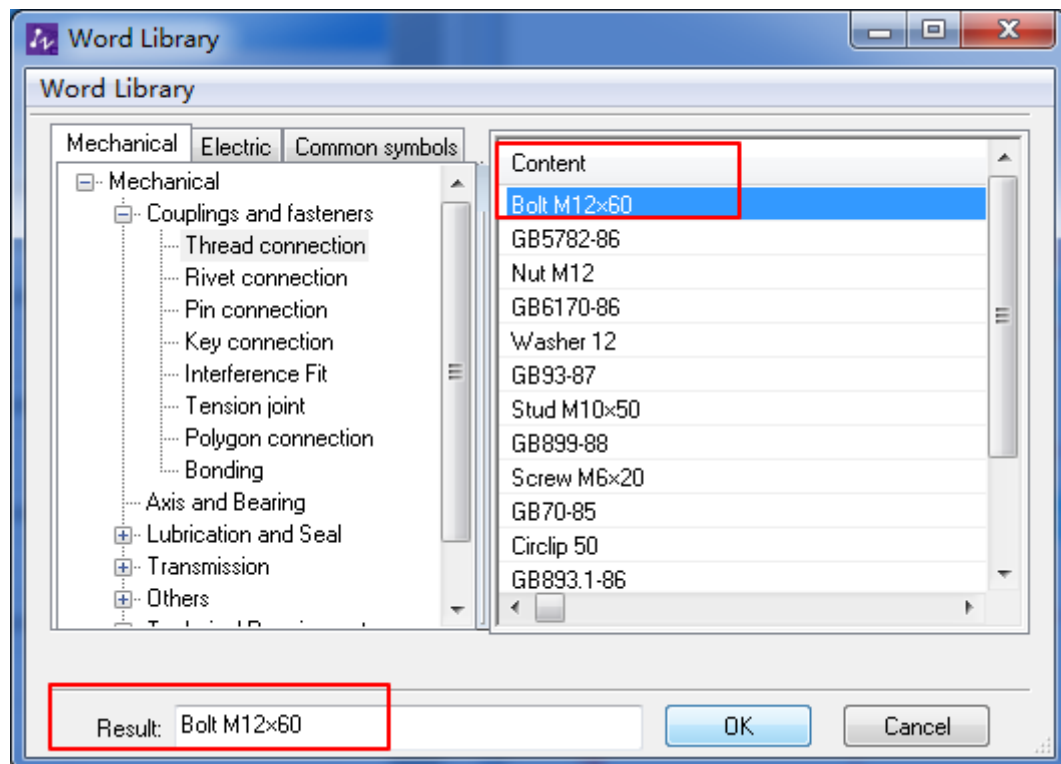
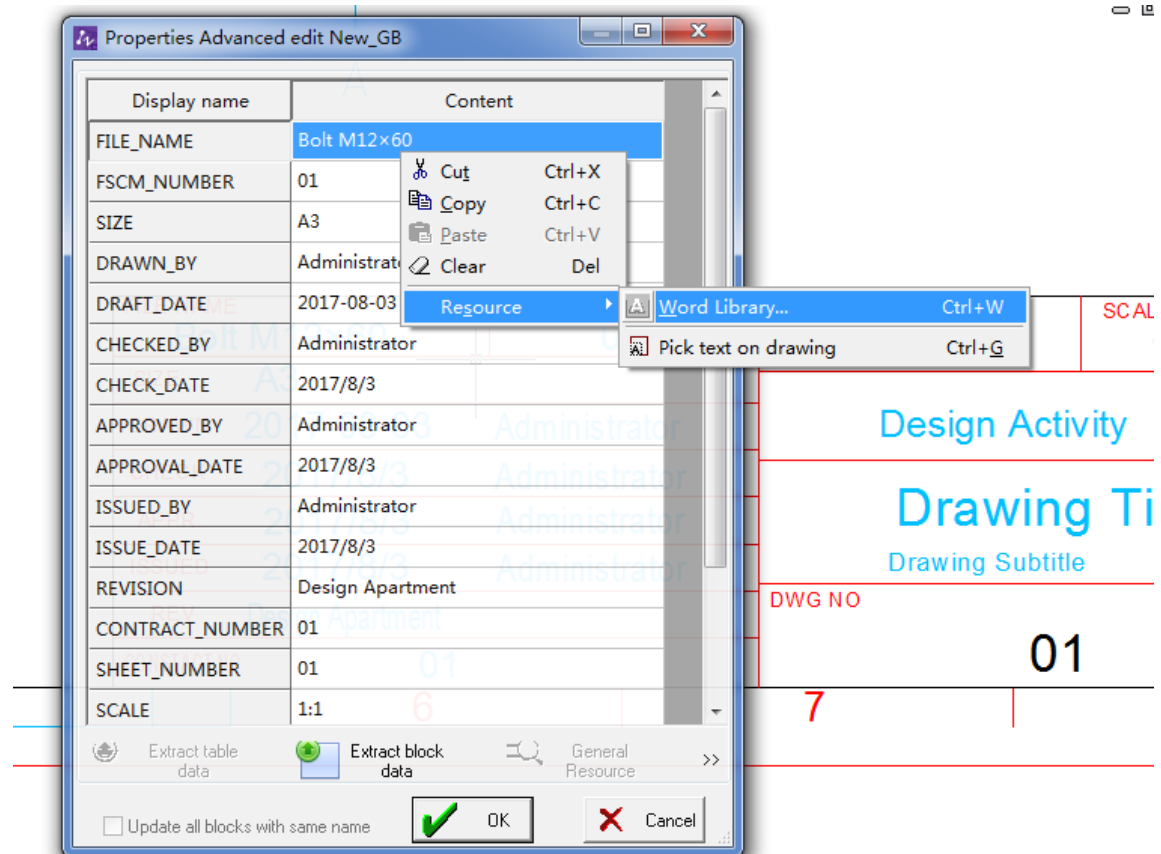


Display name	Content	Inner name	Field type	Number of decimal pl.	Alignment	Row align	Property direction	Edit Allowed	Control type
FILE_NAME	Bolt M12×60	FILENAME	Character		Center	Automatic compression	Default	Yes	Edit box
FSCM_NUMBER	01	FSCM	Character		Center	Automatic compression	Default	Yes	Edit box
SIZE	A3	FRAMESIZE	Character		Center	Automatic compression	Default	Yes	Edit box
DRAFT_BY	Administrator	DESIGNER	Character		Center	Automatic compression	Default	Yes	Edit box
DRAFT_DATE	2017-08-03	DATE	Character		Center	Automatic compression	Default	Yes	Date select box
CHECKED_BY	Administrator	CHECK	Character		Center	Automatic compression	Default	Yes	Edit box
CHECK_DATE	2017/8/3	CHECKDATE	Character		Center	Automatic compression	Default	Yes	Date select box
APPROVED_BY	Administrator	APPROVE	Character		Center	Automatic compression	Default	Yes	Edit box
APPROVAL_DATE	2017/8/3	APPRDATE	Character		Center	Automatic compression	Default	Yes	Date select box
ISSUED_BY	Administrator	ISSUE	Character		Center	Automatic compression	Default	Yes	Edit box
ISSUE_DATE	2017/8/3	ISSUEDATE	Character		Center	Automatic compression	Default	Yes	Date select box
REVISION	Design Apartment	REV	Character		Center	Automatic compression	Default	Yes	Edit box
CONTRACT_NUMBER	01	CTRN	Character		Center	Automatic compression	Default	Yes	Edit box
SHEET_NUMBER	01	PAGENO	Character		Center	Automatic compression	Default	Yes	Edit box

☐ Extract table data
 ☒ Extract block data
 ☐ General Resource

☐ Update all blocks with same name

You can directly select one of the contents and input values into it, or you can right click it and then select **Word library**, where you can select the prepared content to fill in.



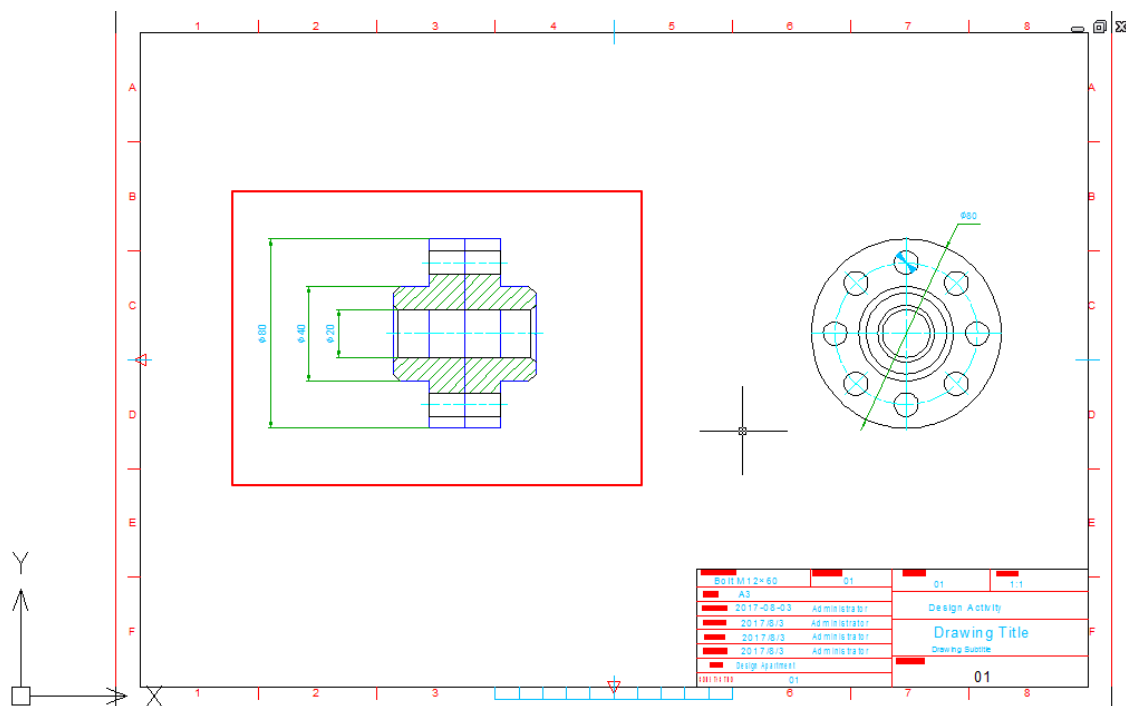
The result is:

FILE NAME	Bolt M12×60	FSCM NO	01	SHEET	01	SCALE	1:1
SIZE	A3	<div>Design Activity</div> <div>Drawing Title</div> <div>Drawing Subtitle</div>					
DRAWN	2017-08-03 Administrator						
CHECK	2017/8/3 Administrator						
APPR.	2017/8/3 Administrator						
ISSUED	2017/8/3 Administrator						
REV	Design Apartment	DWG NO	01				
CONSTACT NO	01						

2.2. Part Builder for drawing standard parts:

2.2.1. Draw basic graphics

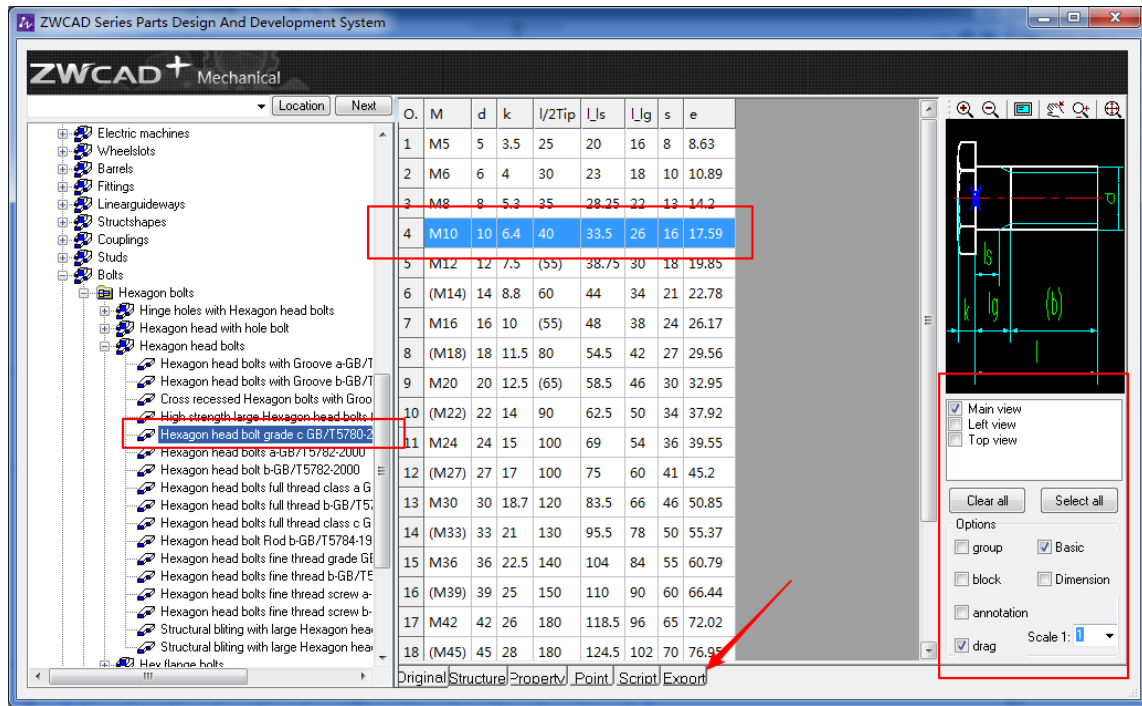
Continue to mirror the part as following shown:



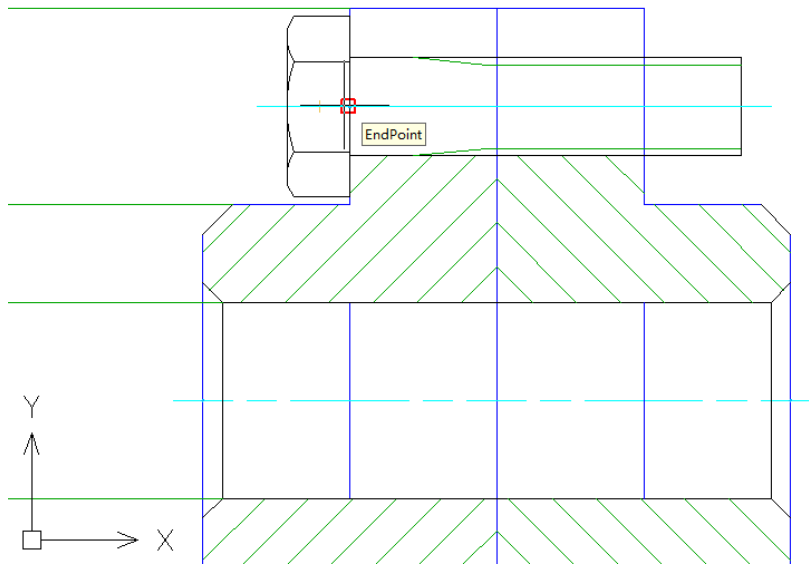
2.2.2. Add standard fasteners for mechanism

Click **All Parts** or input **ZWM_SPART_OUTN**

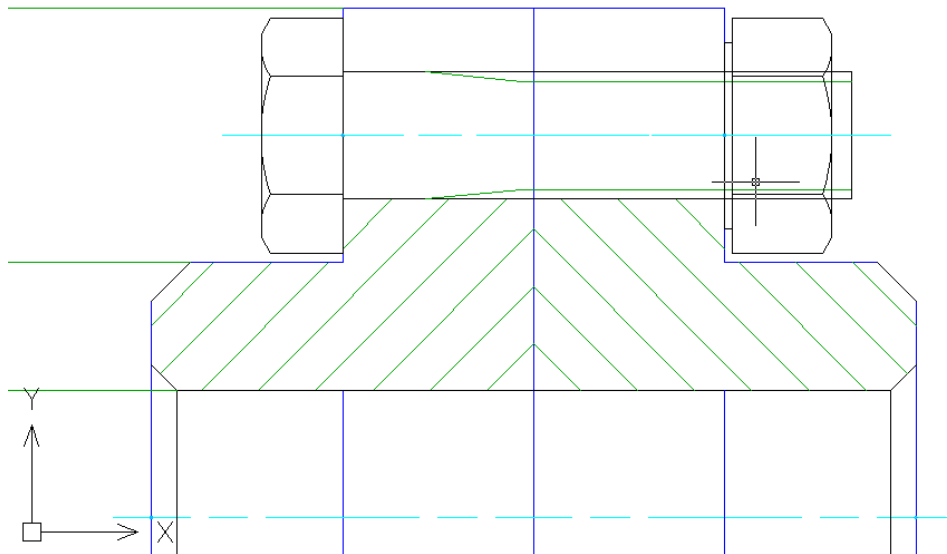
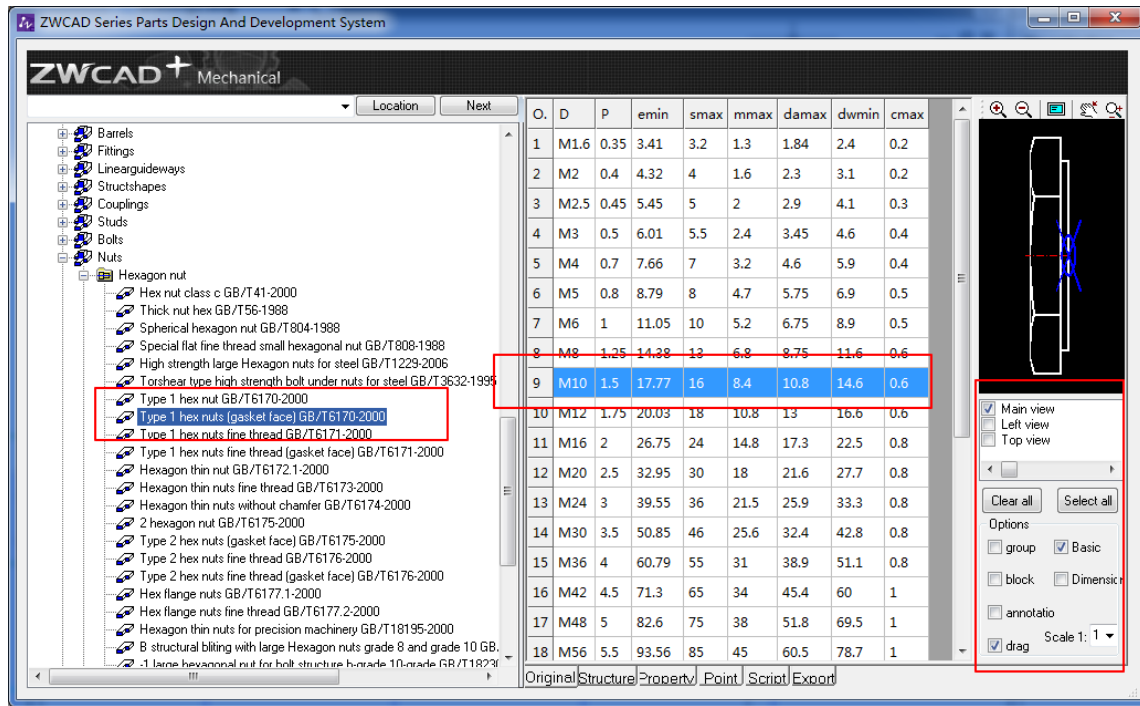
Set the parameter as follows:



Click **Export** to place the bolt as follows.



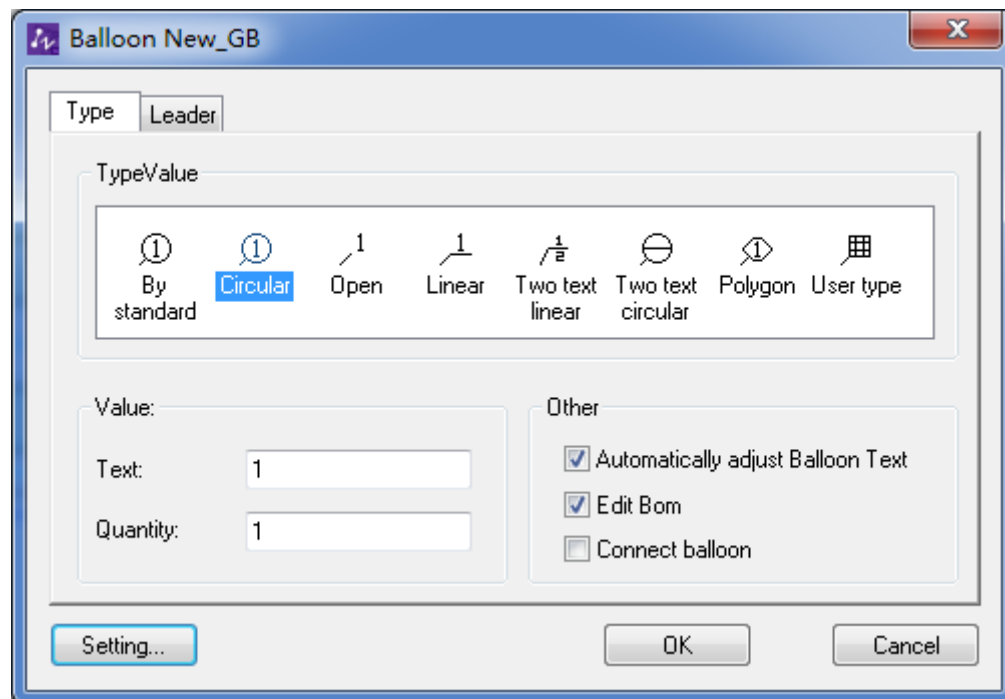
In accordance with the steps above, draw a washer and a nut in order, trim the related line type. The final outcome is shown in the figure:



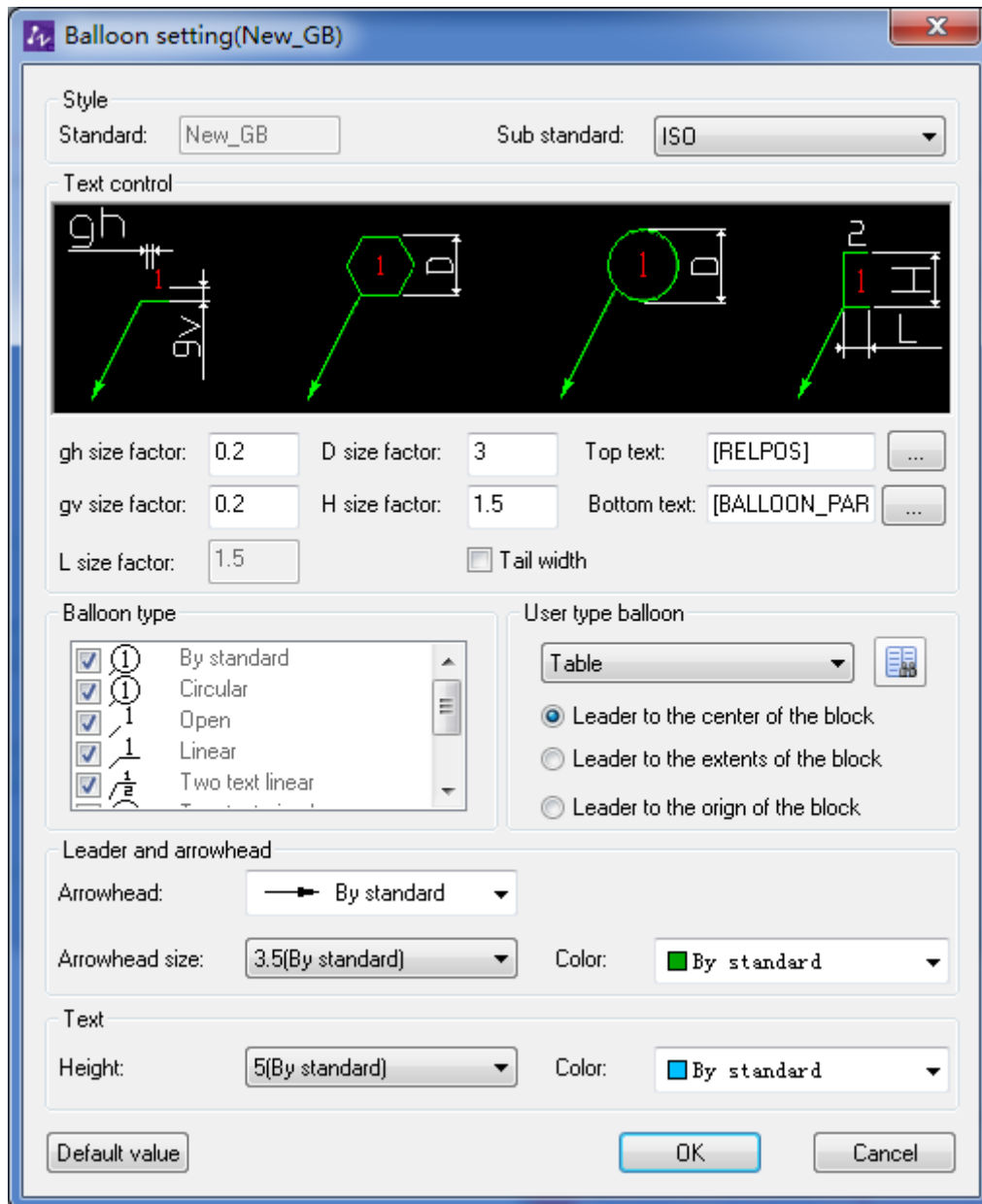
2.3. Balloons dimension and fill out the BOM

2.3.1. Dimension the balloons

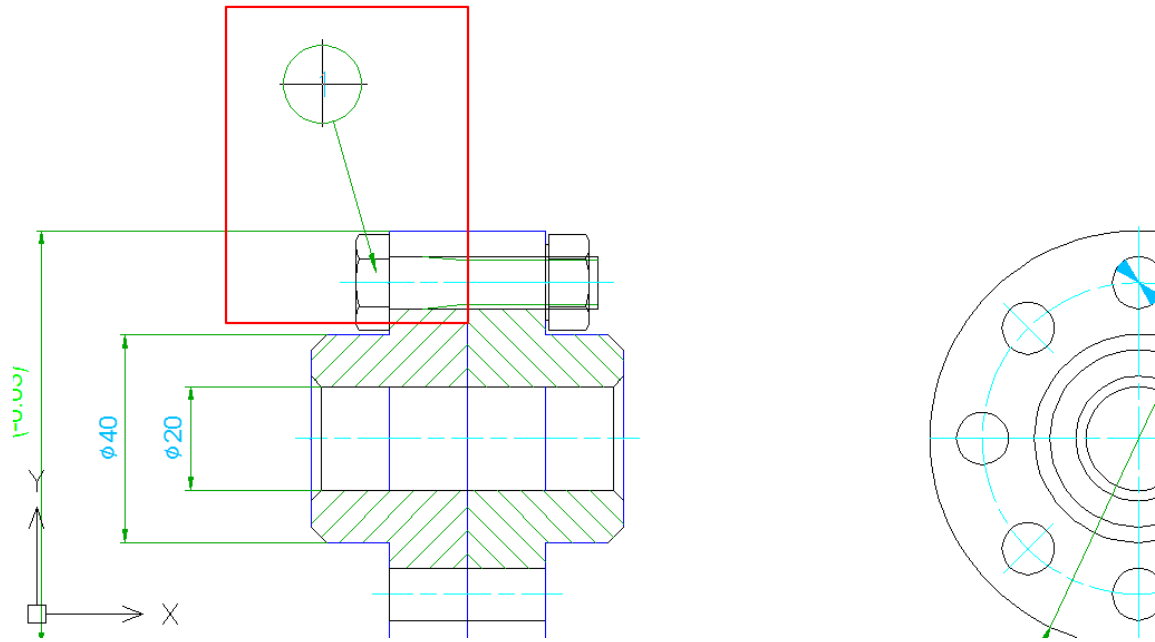
Click **Balloons** or input **ZWMBALLOON**



Click **Setting**

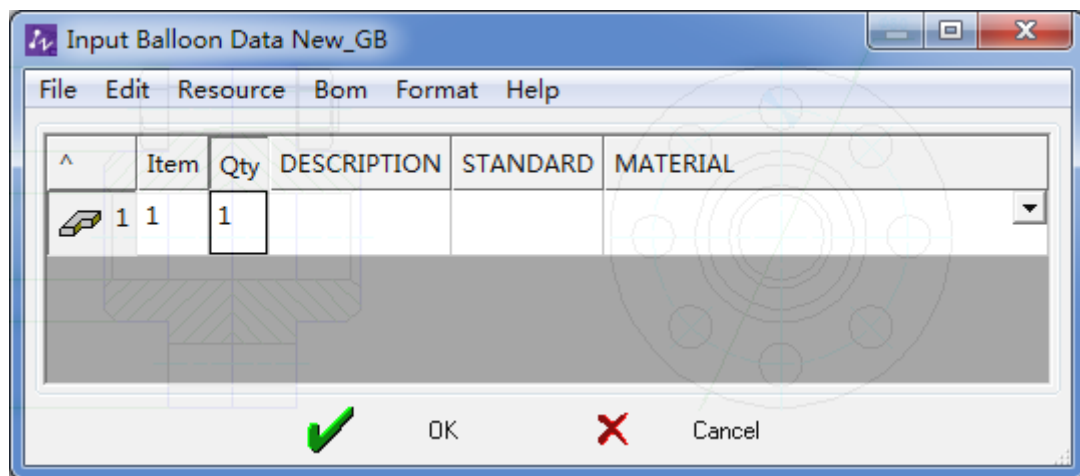


Set it by default, then click **OK** twice, then you can specify the location to add the balloon as follows.

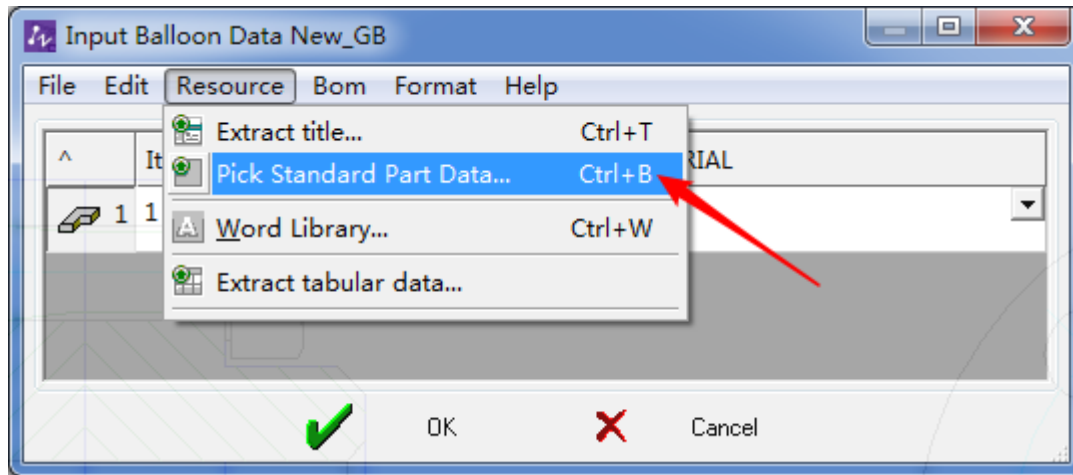


2.3.2. Fill in BOM

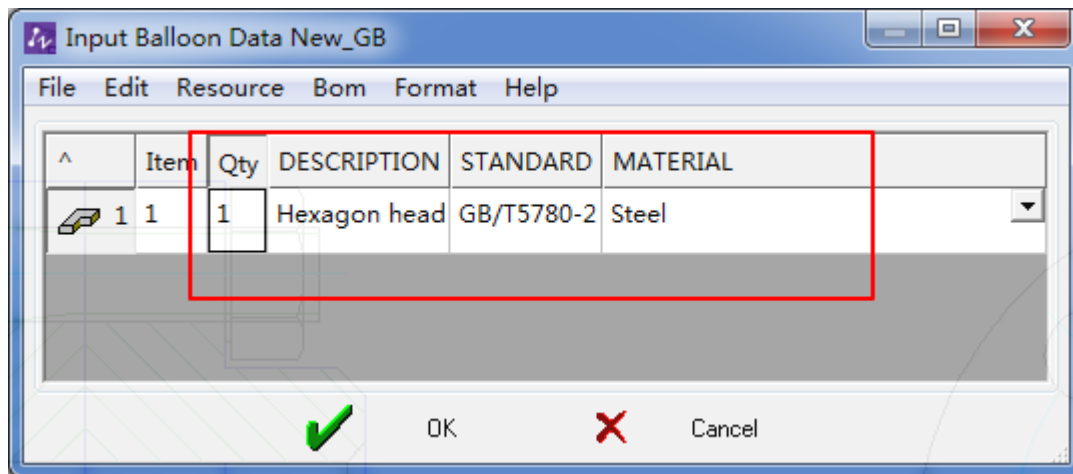
After specify the location, then the following dialog box prompts up:



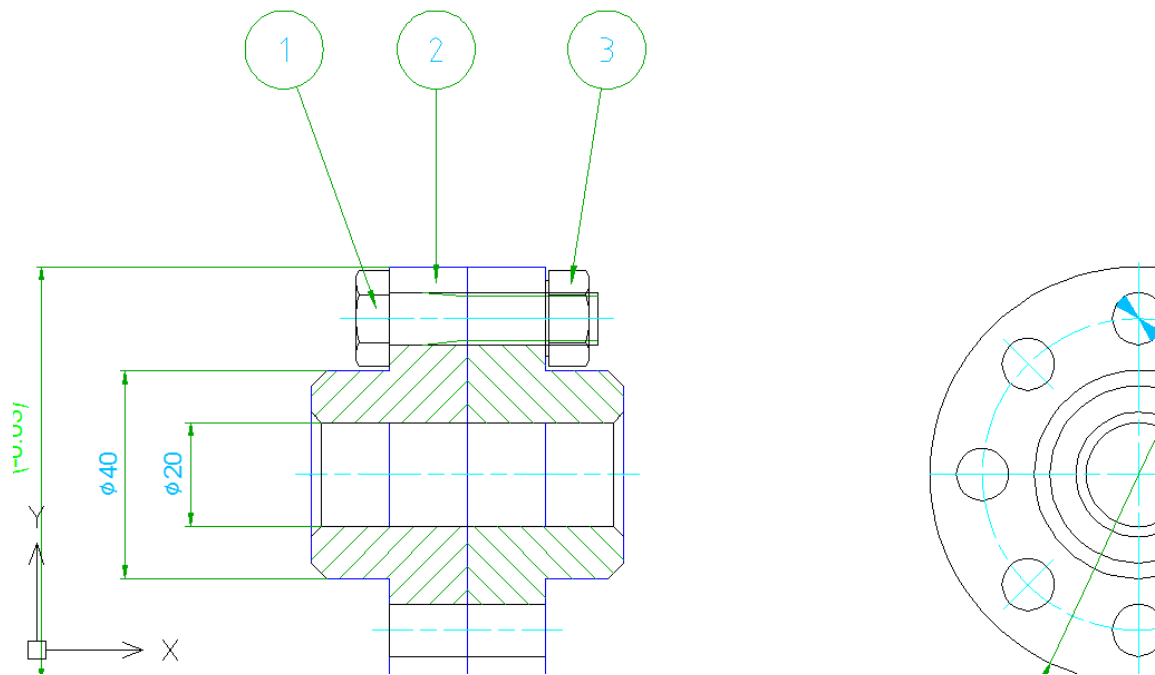
Click **Pick Standard Part Data**



Pick the part, then the information will be filled in automatically.

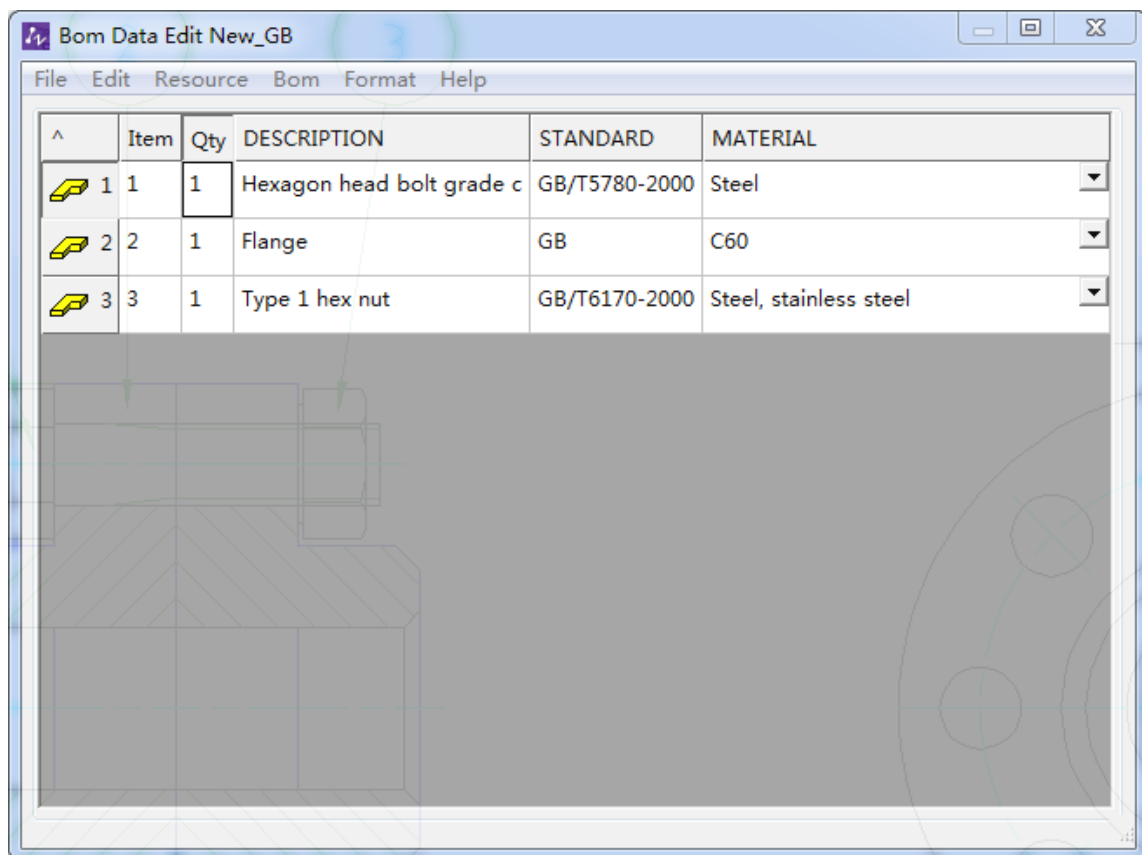


Repeat the steps for the others balloons.

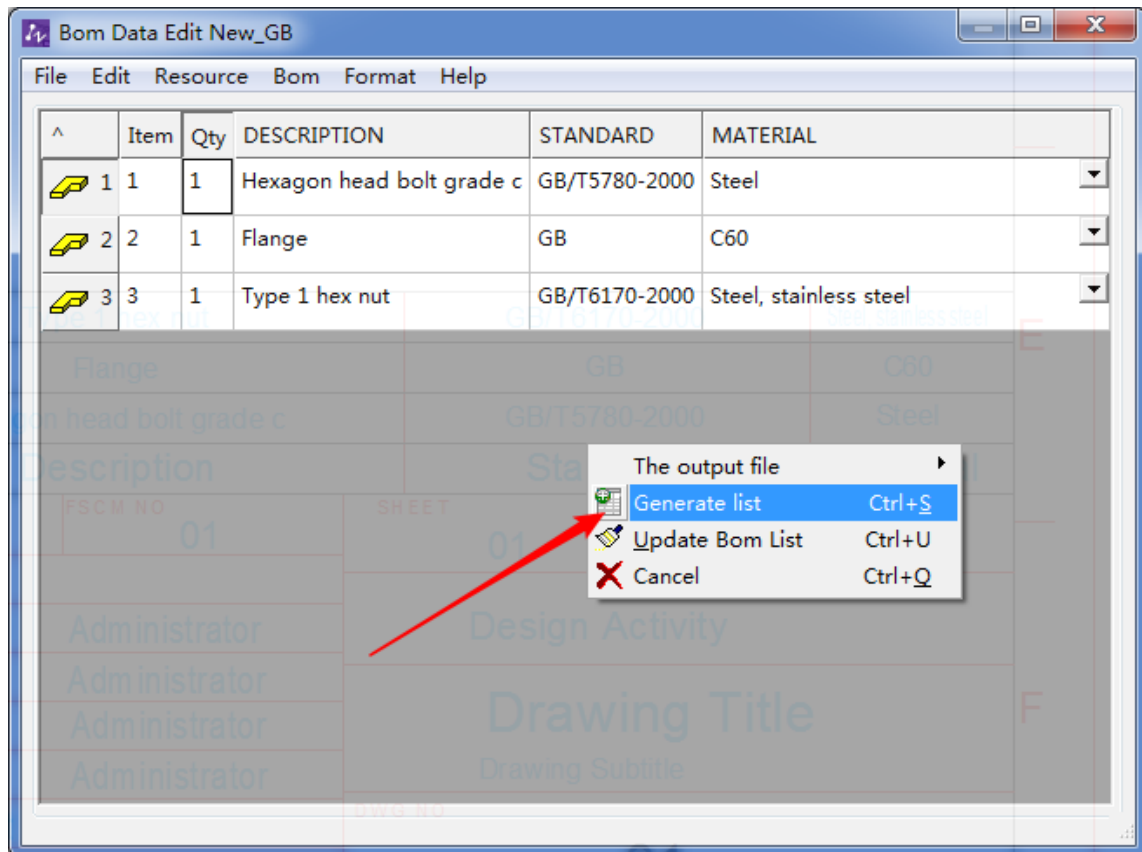


2.3.3. Generate BOM

Click **BOM Data** or input **ZWMTOTALBOMEDIT**



Right click to select **Generate list** or press **Ctrl+S**.



The result is as follows:

3	1	Type 1 hex nut	GB/T6170-2000	Steel, stainless steel
2	1	Flange	GB	C60
1	1	Hexagon head bolt grade c	GB/T5780-2000	Steel
Item	Qty	Description	Standard	Material
FILE NAME		FSCM NO	SHEET	SCALE
Bolt M12×60		01	01	1:1
SIZE		Design Activity Drawing Title Drawing Subtitle		
DRAWN	2017-08-03 Administrator			
CHECK	2017/8/3 Administrator			
APPR.	2017/8/3 Administrator			
ISSUED	2017/8/3 Administrator			
REV	Design Apartment	DWG NO 01		
CONSTRACT NO	01			
		6	7	8

2.4. Add technical requirements

Adding technical requirements for drawings is also one of the important elements in mechanical design.

Click the **Technical Requirement** input **ZWMTECHREQUEST**

3.Command/abbreviated command list

Operation name	Execution command	Simplified command (shortcut)
Frame		
Multi-frame Setup	ZWMFRAMEINIT2	FRA2
Title Editor	ZWMTITLEEDIT	
Additional Editor	ZWMFJLEDIT	
Parameter list Edit	ZWMCSELEDIT	
Switch Frame	ZWMSWITCHFRAME	
Switch Scale	ZWMSWITCHSCALE	
Switch title	ZWMSWITCHTITLE	
Switch BOM	ZWMSWITCHBOM	
Switch Code List	ZWMSWITCHDHL	
Switch Additional List	ZWMSWITCHFJL	
Switch Parameter List	ZWMSWITCHCSL2	
Revision list	ZWMREVISIONLIST	
Current Border	ZWMSTDANDARDC	SDC
Hole Chart	ZWMHOLECHART	
Balloon/BOM		
Balloons	ZWMBALLOON	BAL
Edit Balloon Style	ZWMEDITBALLOONSTYLE	
Balloon Data Editor	ZWMEDITBOMROW	
Align Balloon	ZWMALIGNBALLOON	
Renumber balloons	ZWMRENUMBERBALLOON	
Hide Balloons	ZWMHIDEBALLOON	
Show Balloons	ZWMSHOWBALLOON	
Collect balloons	ZWMCOMBINEBALLOON	
Adding leader	ZWMADDLEADER	
Removing leader	ZWM ADDLEADER	
Generate BOM List	ZWMPARTLIST	PLT
Processing BOM Data	ZWMTOTALBOMEDIT	TBE
Dimension		
Power Dimension	ZWMPOWERDIM	D
Multi-dimension	ZWMAUTODIM	DAU
Length dimension	ZWMLINEARDIM	

Horizontal Dimension	ZWMHORIZONTALDIM	
Vertical Dimension	ZWMVERTICALDIM	
Aligned Dimension	ZWMALIGNEDDIM	
Half-section Dimension	ZWMHALFALIGNDIM	
Point-to-line Dimension	ZWMPRTLINEDIM	
Diameter Dimension	ZWMDIAMETERDIM	
Radius Dimension	ZWMRADIUSDIM	
Jogged radius Dimension	ZWMJOGGEDRADIUSDIM	
Coordinate Dimension	ZWM_DIMORDINATE	
Arc length Dimension	ZWMARCLENGTHDIM	
Chain Dimension	ZWMCHAINDIM	
Baseline Dimension	ZWMBASELINEDIM	
Center mark	ZWMCENTERDIM	
Angular Dimension	ZWMANGULARDIM	DAN
Leader Dimension	ZWMANGULARDIM	NO
Sheet thickness Dimension	ZWMTHICKNESSDIM	
Chamfer Dimension	ZWMCHAMFERSYM	CHS
Dimension combination	ZWMDIMJOIN	
Inserting dimension	ZWMDIMINSERT	
Dimension alignment	ZWMDIMALIGN	
Dimension check	ZWMDIMCHECK	
Tolerances for query	ZWMDIMTOLQUERY	
Symbols		
Surface Texture	ZWMSURFSYM	SF
Feature Control Frame	ZWMFCFRAME	FCF
Datum identifier	ZWMDATUMID	DTD
Feature identifier	ZWMFEATID	
Datum target	ZWMDATUMTGT	
Taper&slope symbol	ZWMTAPERSYM	TPS
Center hole	ZWMCENTERHOLE	CTH
Circle mark	ZWMCIRCLEMARK	BJ
Break symbol	ZWMBREAKSYMBOL	BRS
Elevation symbol	ZWMELEVSYM	EF
Welding symbol	ZWMWELDING	WE
Creating view		
Section Line	ZWMSECTIONLINE	STL
Direction	ZWMVIEWDIRECTION	
Detail view	ZWMDDETAIL	
Scale Area	ZWMSCAREA	
Text processing		
Text Annotation	ZWMDIMTEXT	DTT

Technical requirements	ZWMTECHREQUEST	TRT
Drawing tools		
Smart line	ZWMINTELLIGENTLINE	SS
Circle (Cen)	ZWMCIRCLEBYC	CBC
Circle (3P)	ZWMCIRCLEBY3P	CBP
Arc (Cen)	ZWMARCBYC	ASF
Arc (3P)	ZWMARCBY3P	ABP
Mirror line	ZWMMIRRORLINE	DMRL
Parallel line	ZWMPARALLELLINE	PAL
Vertical line	ZWMVERTICALLINE	VL
Tangent	ZWMTANGENTLINE	QTL
Common tangent	ZWMCOMMONTANGENT	CTT
Perpendicular bisector	ZWMPERPBISECTOR	PBS
Angle line	ZWMANGLELINER	AN
Bisector (angular bisector)	ZWMANGLEBISECTOR	AB
Ray	ZWMRADIATION	
Center line	ZWMCENTERLINE	CL
Zigzag line	ZWMZIGZAGLINE	
Waviness line	ZWMWAVILNESSLINE	WL
Rectangle	ZWMRECTANGLE	REC
Construction tools		
Formula curves	ZWMFCURVE	FC
Fillet	ZWMFILLETAC	F
Chamfer	ZWMFILLETL	CHA
Truncation Line	ZWMSECTIONS	SES
Inserting break symbol	ZWMBREAKSYMBOL1	BRS1
Dynamic extension	ZWMDYNAMICEXTEND	DE
Construction line		
Construction line	ZWMCONSTLINES	CLIN
Automatic construction line	ZWMAUTOCLINES	
Horizontal	ZWMCONSTHOR	
Vertical	ZWMCONSTVER	
Cross	ZWMCONSTCRS	
Two points or an angle	ZWMCONSTHB	
Form a relative angle with a straight line	ZWMCONSTHW	
All-distance parallel	ZWMCONSTPAR	
Half distance parallel	ZWMCONSTPAR2	

Perpendicular to the connection between two points	ZWMCONSTLOT2	
Perpendicular to a straight line	ZWMCONSTLOT	
Bi-section line	ZWMCONSTHM	
Through point ray	ZWMCONSTXRAY	
Through point straight line	ZWMCONSTXLINE	
Z direction	ZWMCONSTZ	
Construction circle		
Construction circle	ZWMCONSTCIRCLE	
Parallel construction line tangent to the circle	ZWMCONSTTAN	
Construction line tangent to two circles	ZWMCONSTTC	
Construction line concentric with a circular	ZWMCONSTCC	
Construction line of end line of axis	ZWMCONSTCCREA	
Construction circle tangent to a straight line	ZWMCONSTC2	
Construction circle tangent to two straight lines	ZWMCONSTKR	
Rectangular construction line externally tangent to a circle	ZWMCONSTCIRCLI	
HoleAxis projection	ZWMHSPROJECTOR	HSP
Process Tank Structure	ZWMCONSTRECESS	CSR
Single-hole	ZWMSINGLEHOLE	SHO
Hole array	ZWMARRAYHOLE	AH
Aids		
convert proxy entity to block	ZWMPROXYTOBLOCK	
Super Edit	ZWMSUPEREDIT	V
Area calculation	ZWMAREA	AA
Power Recall	ZWMPOWERRECALL	
Power Erase	ZWMPOWERERASE	
Tabular data pick up	ZWMTABLEDATAPICKUP	TB

Dwg Data Pickup	ZWMDWGDATAPICKUP	
Find and Replace Text	ZWMDWGDATAFINDREPLACE	
Jigsaw Print	ZWMJIGSAWPRINT	JS
Layer transform tool	ZWMCHGLAYER	
Part Builder	ZWM_SPART_OUT	PB
Component Design		
Shaft Design	ZWMSHAFT	
Gear design	ZWMGEAR	
Super-symbol library		
Invocation of super symbol library	ZWM_SYMOUT	FH
Hydraulic and pneumatic symbol library		YQFH
Electrical symbol library		DQFH
Mechanism symbol		JGFH
Metal structural member		JSFH
System maintenance tools		
Style Configuration	ZWMSTYLEMANAGER	
Word library	ZMWWORDLIBMNG	
Define Title Block	ZWMTITLEDEFINE	
Define Additional Block	ZWMFJLDEFINE	
Define Paralist	ZWMCSLDEFINE	
Define Drawing Code Block	ZWMREVERSEDEFINE	
Define Attblock	ZWMATTBLOCKDEF	
Define Bom Head	ZWMBOMHEADDEFINE	
Define Bom Body	ZWMBOMBODYDEFINE	
Irregular Table Pickup Configuration	ZWMTBLDATAPICKUPTITCONF IG	
2D Table Pickup Configuration	ZWMTBLDATAPICKUPBOMCO NFIG	

Note: Proficiency with the commands above will greatly help your work efficiency. It is suggested to grasp one or two-letter commands before go for the longer ones. This is also a good opportunity to exercise the left-handed applications and operations.