cq Cheatsheet

A Quick Guide To The Most Commonly Used Functions!

Full API reference** | **Examples** | **Install CQ-Editor** | **Mode

3D Construction

Primitives

box
(length, width, height)

sphere
(radius)

cylinder
(height, radius)

text
(txt, fontsize, distance)

^ quickly perform ^
+/-/& boolean ops with
(..., combine="a/s/i")
or use
union/cut/intersect(shape)

Additive

extrude
(until)

revolve
(angleDegrees)

loft
(ruled)

sweep
(path,
isFrenet,
transitionMode)

Subtractive

cutBlind
(until)

cutThruAll
()

hole
(diameter,
depth)

shell
(thickness)

fillet
(radius)

chamfer
(length)

2D Construction

rect
(xLen, yLen)

circle
(radius)

ellipse
(x_radius,
y_radius)

center
(x, y)

moveTo
(x, y)

move
(xDist, yDist)

lineTo
(x, y)

line
(xDist, yDist)

polarLine
(distance, angle)

vLine
(distance)

hLine
(distance)

polyline
(listOfXYTuple)

Sketching

rect
(w, h)

circle
(r)

ellipse
(a1, a2)

trapezoid
(w, h, a1)

regularPolygon
(r, n)

polygon
(pts)

fillet
(d)

chamfer
(d)

finalize
()

Import/Export

importers.importDXF
(path, tol)

importers.importStep
("path")

exporters.export
`(solid, "path/solid.***")`

`Where *** can be: svg, step, stl, amf, vrml, json`

Assemblies

Assembly
`()`

add
`(obj, loc, color)`

constrain
`(***)`

solve
`()`

save
`("path/assembly.***")`

`Where *** can be: step, xml, gltf, vtkjs, vrml`

Selector String Modifiers

Axis Strings are: X, Y, Z, XY, YZ, XZ

Mod	Description
|	Parallel to = **ParallelDirSelector**
#	Perpendicular to = **PerpendicularDirSelector**
+/-	Pos/Neg direction = **DirectionSelector**
>	Max = **DirectionMinMaxSelector**(directionMax=True)
<	Min = **DirectionMinMaxSelector**(directionMax=False)
%	Curve/surface type = **TypeSelector**

Eg: select the top face (> in Z direction) = `.faces(">Z")`

Selector Methods

CadQuery selector strings and classes allow filtering to select objects.

Selector Methods

faces(selector)
edges(selector)
vertices(selector)
solids(selector)
shells(selector)

Selector Classes

NearestToPointSelector(pnt)
ParallelDirSelector(vector)
PerpendicularDirSelector(vector)
DirectionMinMaxSelector(vector)
RadiusNthSelector(n)
AndSelector(selector, selector)
SumSelector(selector, selector)
SubtractSelector(selector, selector)
InverseSelector(selector)

Workplane Positioning

rotate

translate (Vector(x, y, z))

rotateAboutCenter (Vector(x, y, z), angleDegrees)

(Vector(x, y, z), Vector(x, y, z), angleDegrees)

Position a workplane relative to an existing feature with:
`.workplane(offset, origin)`
sets the offset perpendicular to the current plane
sets the origin relative to (0,0) on the current plane

Named Planes

Direction references refer to the global directions.

Name	xDir	yDir	zDir
XY	+x	+y	+z
YZ	+y	+z	+x
XZ	+x	+z	-y
front	+x	+y	+z
back	-x	+y	-z
left	+z	+y	-x
right	-z	+y	+x
top	+x	-z	+y
bottom	+x	+z	-y

Examples of Filtering Faces

All types of filters work on faces. In most cases, the selector refers to the direction of the normal vector of the face. If a face is not planar, selectors are evaluated at the center of mass of the face. This can lead to results that are quite unexpected.

Selector	Selector Class	Selects	# Objects Returned
+Z	DirectionSelector	Faces with normal in +z direction	0..many
|Z	ParallelDirSelector	Faces parallel to xy plane	0..many
-X	DirectionSelector	Faces with normal in neg x direction	0..many
#Z	PerpendicularDirSelector	Faces perpendicular to z direction	0..many
%Plane	TypeSelector	Faces of type plane	0..many
>Y	DirectionMinMaxSelector	Face farthest in the positive y dir	0 or 1
<Y	DirectionMinMaxSelector	Face farthest in the negative y dir	0 or 1

Examples of Filtering Edges

Some filter types are not supported for edges. The selector usually refers to the direction of the edge. Non-linear edges are not selected for any selectors except type (%). Non-linear edges are never returned when these filters are applied.

Selector	Selector Class	Selects	# Objects Returned
+Z	DirectionSelector	Edges aligned in the Z direction	0..many
|Z	ParallelDirSelector	Edges parallel to z direction	0..many
-X	DirectionSelector	Edges aligned in neg x direction	0..many
#Z	PerpendicularDirSelector	Edges perpendicular to z direction	0..many
%Plane	TypeSelector	Edges type line	0..many
>Y	DirectionMinMaxSelector	Edges farthest in the positive y dir	0 or 1
<Y	DirectionMinMaxSelector	Edges farthest in the negative y dir	0 or 1

Examples of Filtering Vertices

Only a few of the filter types apply to vertices. The location of the vertex is the subject of the filter.

Selector	Selector Class	Selects
>Y	DirectionMinMaxSelector	Vertices farthest in the +Y dir
<Y	DirectionMinMaxSelector	Vertices farthest in the -Y dir
>>Y[-2]	CenterNthSelector	2nd farthest vertex in the +Y dir
<<Y[0]	CenterNthSelector	1st closest vertex in the Y dir