

INTRODUCTION

Computational Design Laboratory
Department of Automotive Engineering
Hanyang University, Seoul, Korea



한양대학교
HANYANG UNIVERSITY



CDL

Computational
Design
Lab

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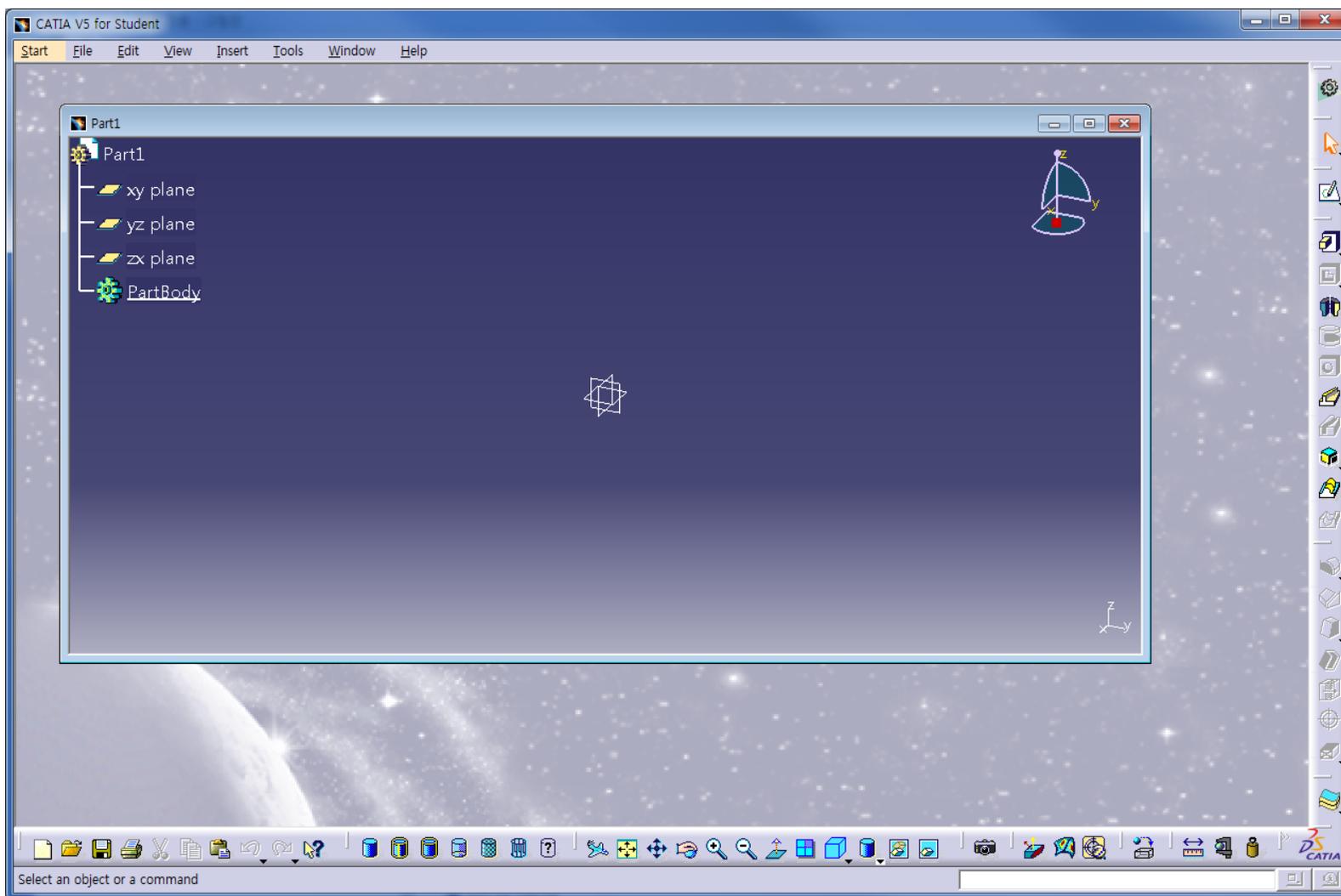
- Introduction
 - **수업방향**
 - 시작하기: Start, File → Open, Save
 - 기본설정: Tools → Customize, Options
 - 작업화면 설정: View, Window, Hide/Show
 - Measure / Help Document

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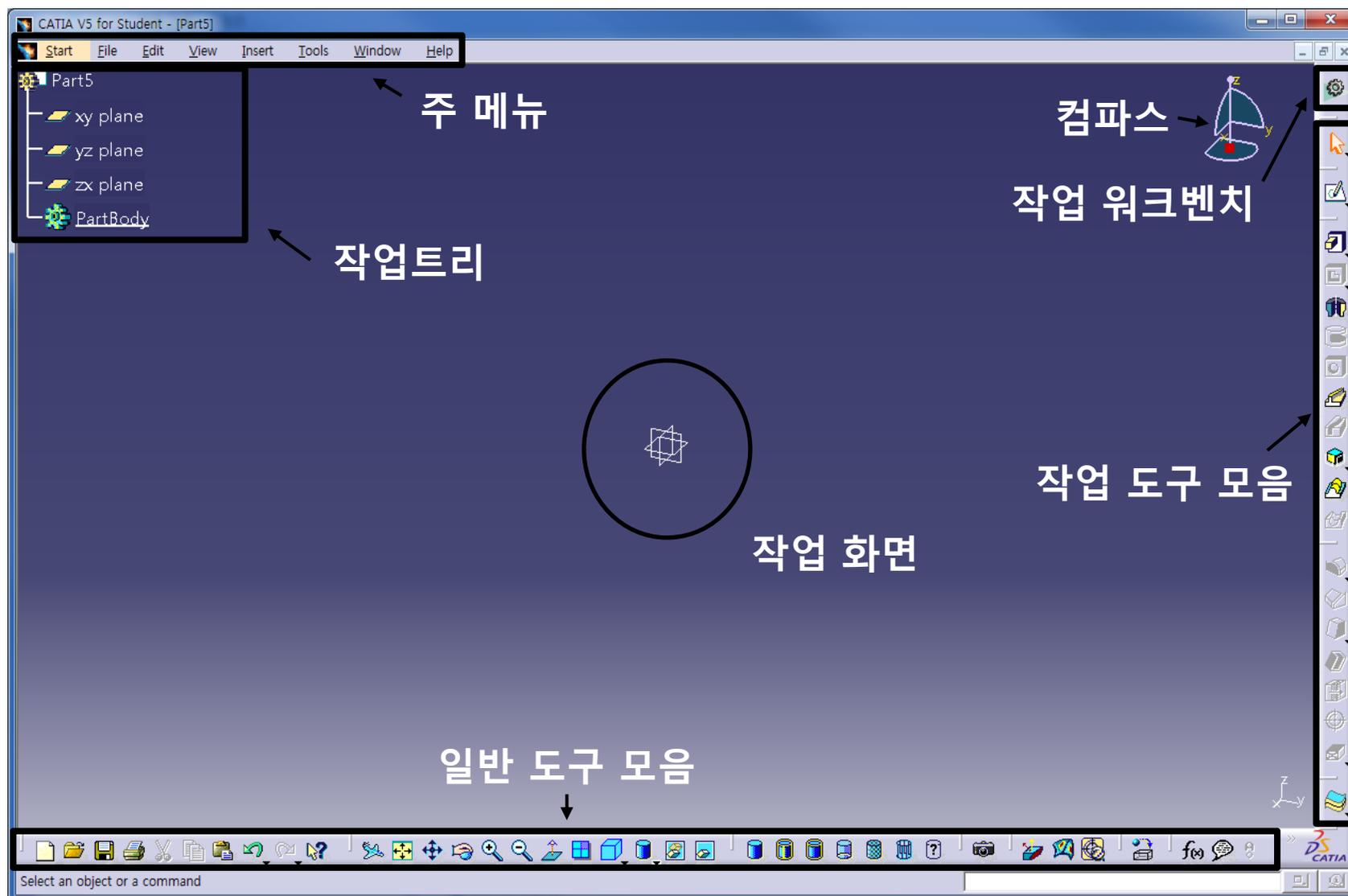
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실행 화면

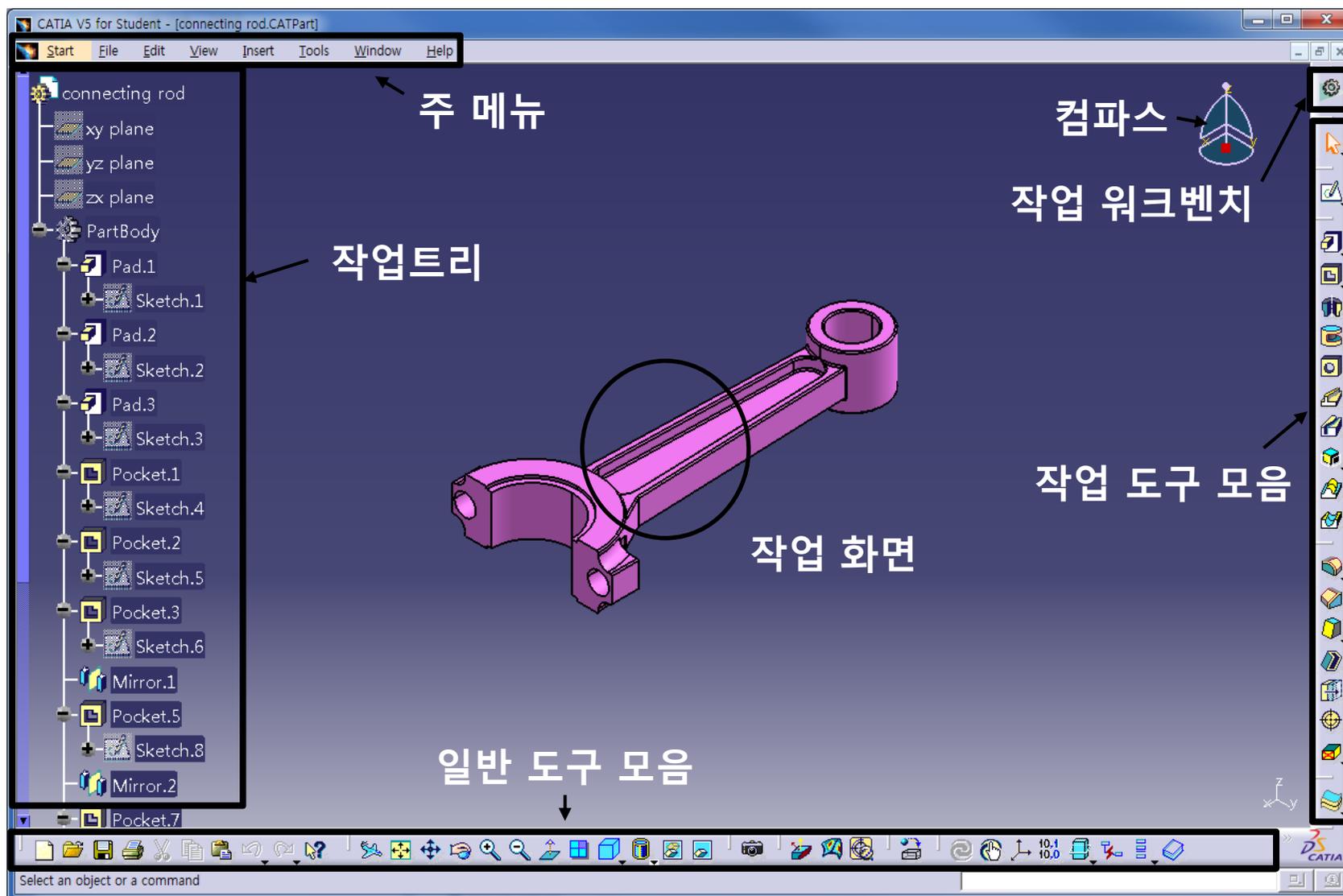
CATIA 실행화면



화면 구성



화면 구성 : 모델이 있는 경우

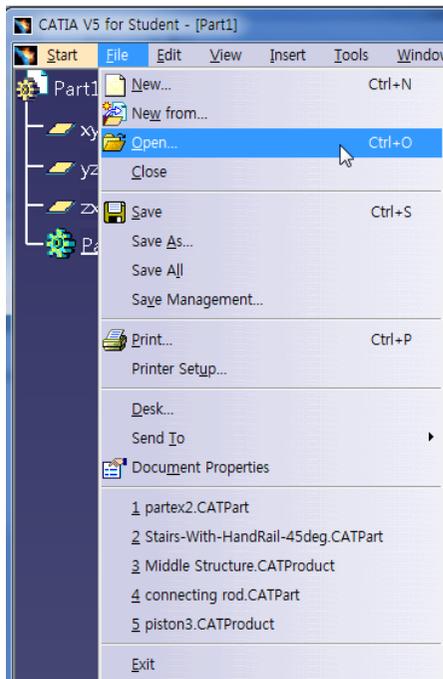


FILE 메뉴: 모델 불러오기

모델 파일 불러오기

(파일의 버전보다 사용 CATIA 버전이 낮을 경우 에러 발생)

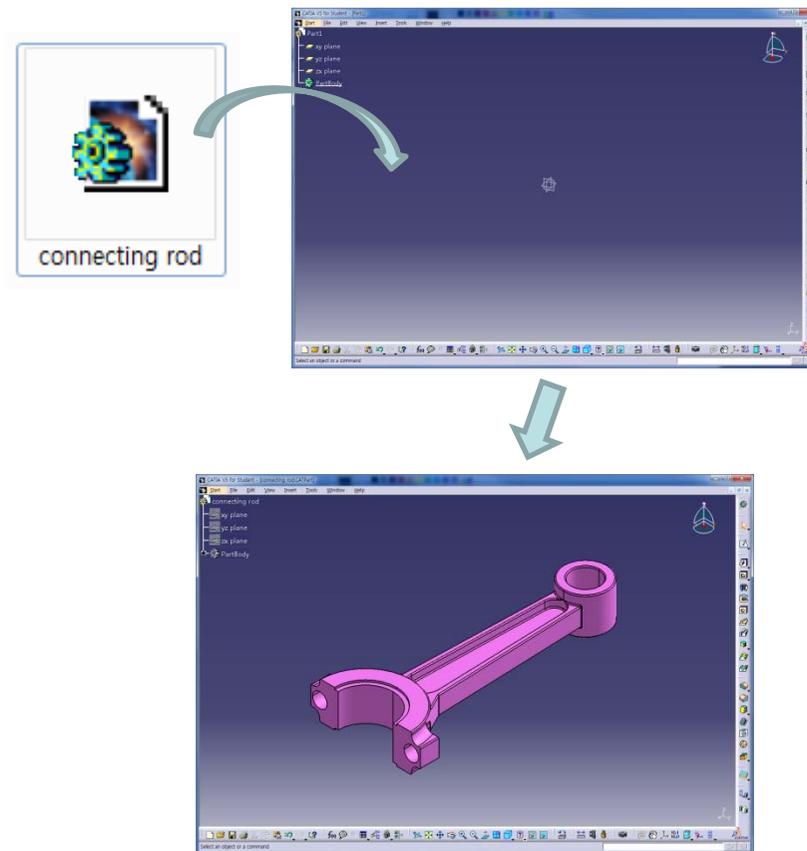
메뉴에서 열기 실행



하단의 툴바 이용

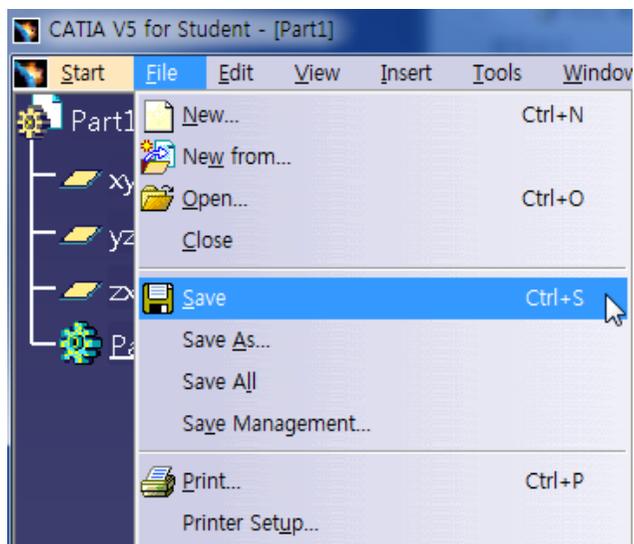


화면에 드래그 또는 파일 더블클릭

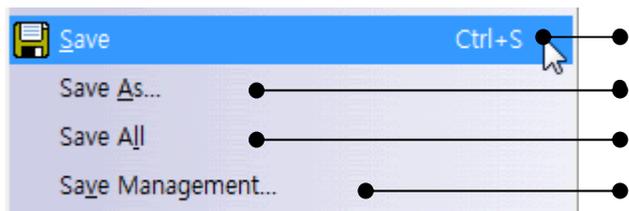


FILE 메뉴: 모델 저장하기

모델 파일 저장하기



파일 불러오는 것과 마찬가지로 메뉴의 File→Save를 통해 저장하거나 작업화면 하단의 저장버튼 또는 Ctrl+s 단축키를 이용하여 저장할 수 있다.



- 현재의 저장위치에 동일한 이름으로 저장
- 저장위치, 이름, 확장자를 변경하여 저장
- 열려있는 모든 파일을 동일한 속성으로 저장
- 열려있는 각각의 파일들의 저장방식 조절 가능

사용 가능한 파일 종류

CATIA V5의 주요 File Format

| File Format | 설 명 |
|---------------|--|
| *.CATPart | Part Design의 모델링 데이터를 저장하는 file format |
| *.CATProduct | Assembly Design의 데이터를 저장하는 file format |
| *.CATDrawing | 도면 데이터를 저장하는 file format |
| *.CATAnalysis | CAE 해석 데이터를 저장하는 file format |

기타 File Format

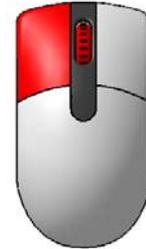
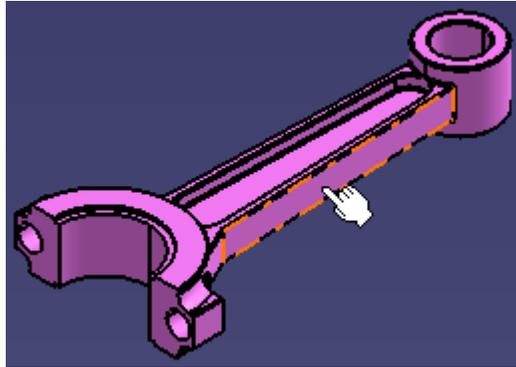
| File Format | 설 명 |
|--------------------|--|
| *.dxf, *.dwg | Autocad 표준 format을 read/write 할 수 있다. |
| *.igs,*.stp,*.step | igs, step 등의 중립 format을 read/write 할 수 있다. |

마우스 조작

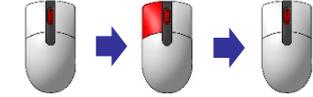
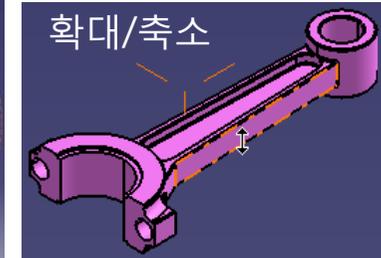
마우스 버튼을 이용하여 모델의 선택/이동/회전 등이 가능



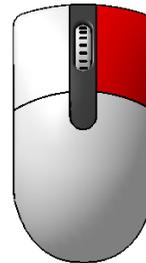
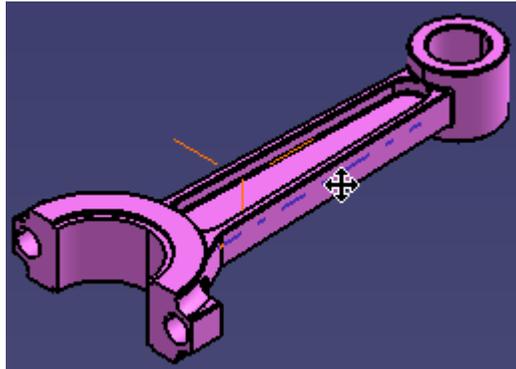
대상선택



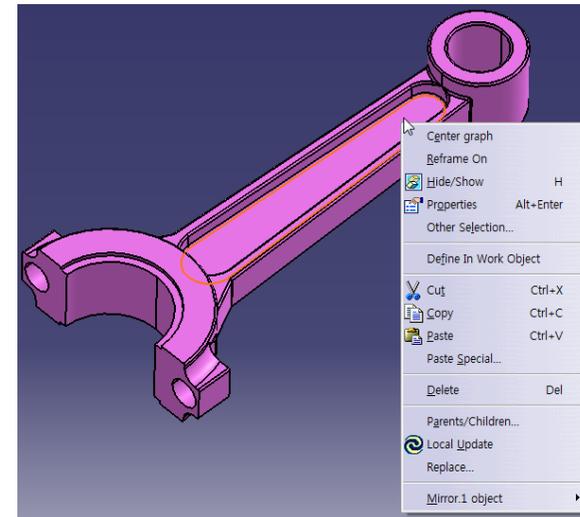
확대/회전
(휠, 버튼)



화면이동
(휠)



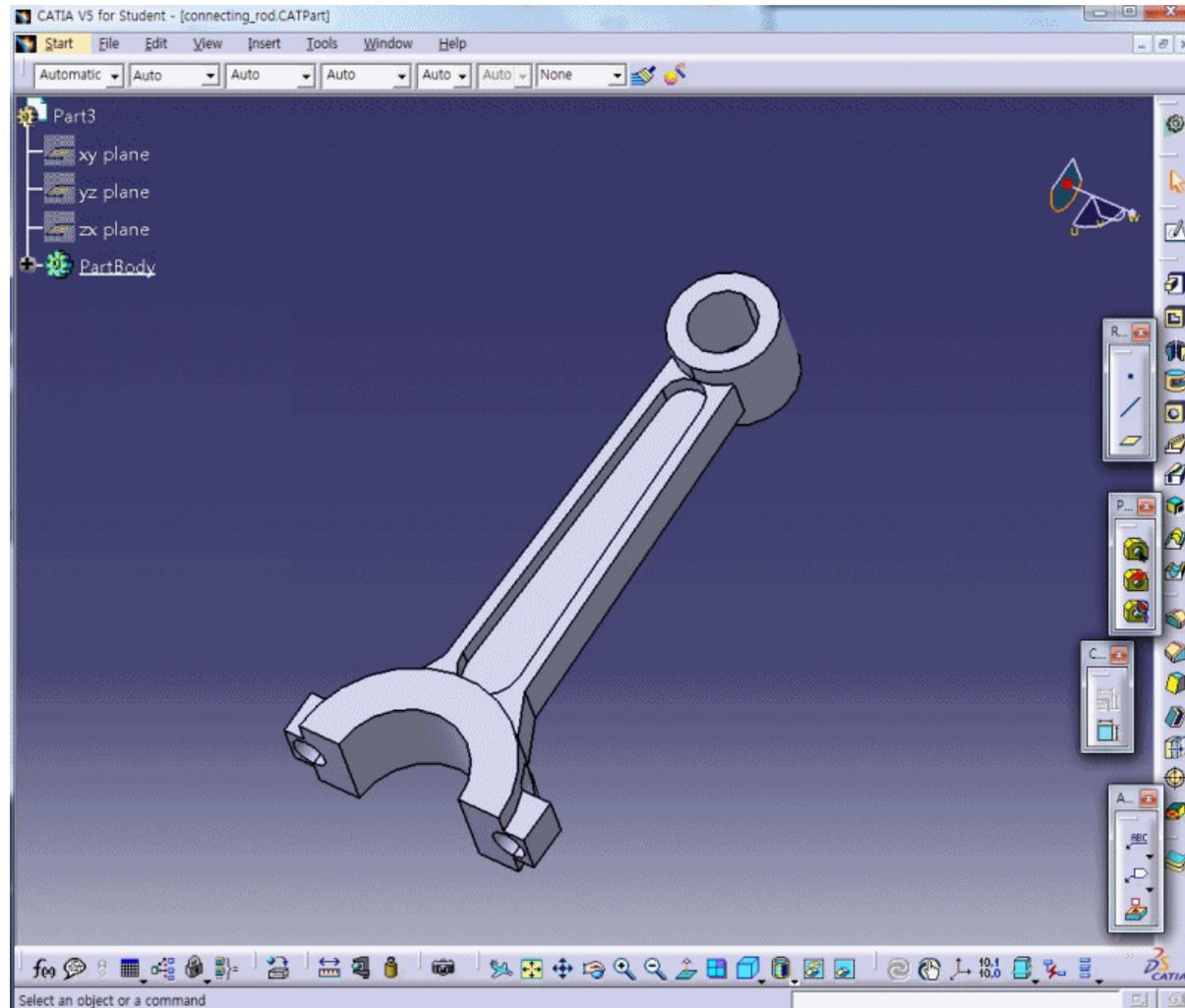
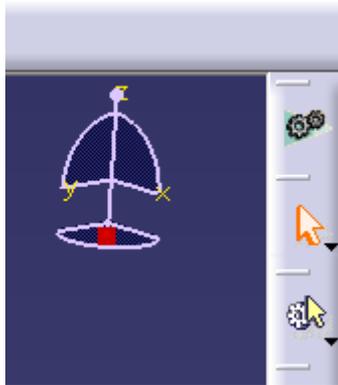
문맥적 기능
(Contextual
Menu)



COMPASS 사용하기

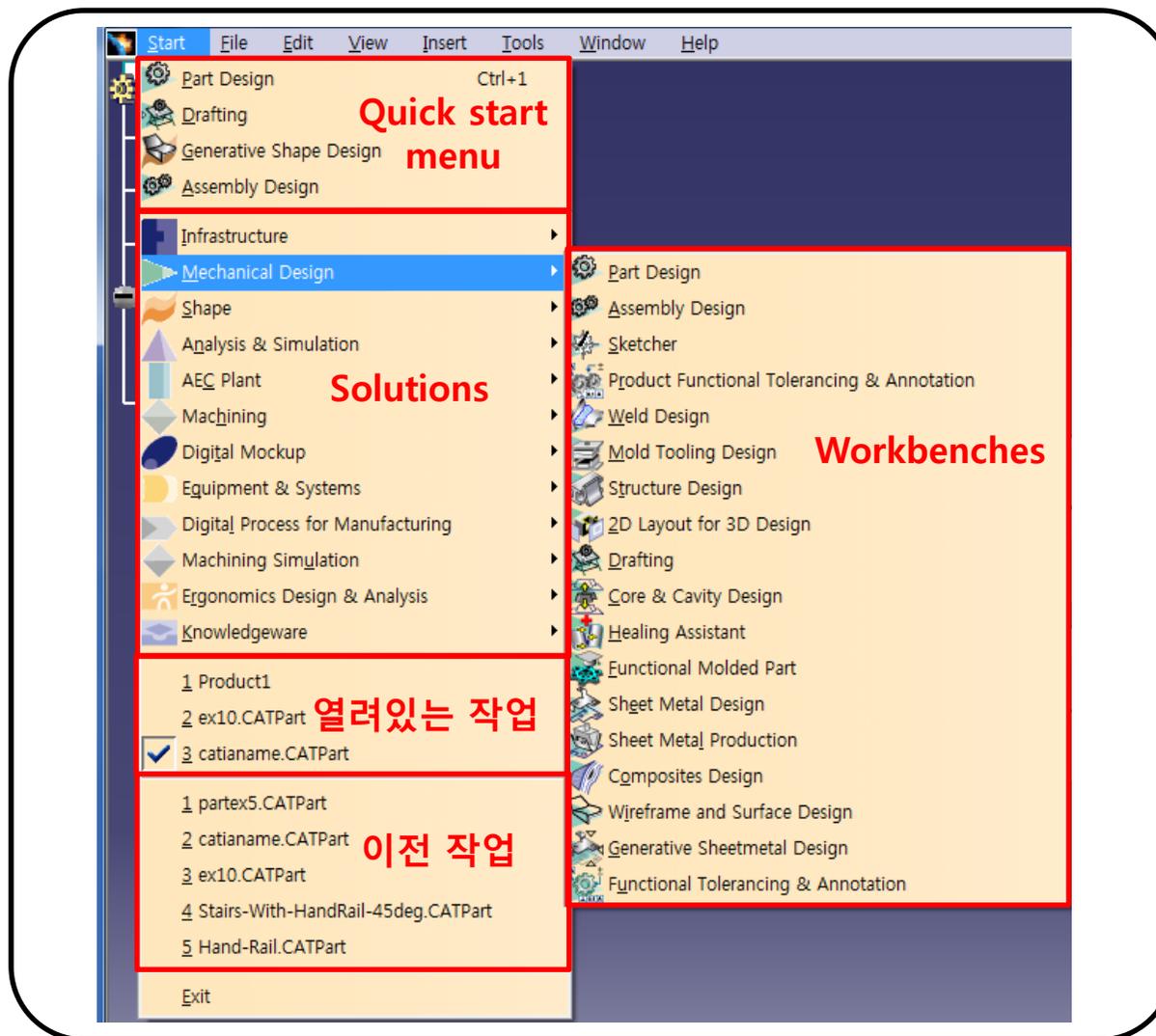
화면 오른쪽 상단의 Compass 조작법

- 마우스를 대신하여 화면 조작 가능 (드래그하여 파트에 부착할 경우 부착위치 기준으로 조작가능)



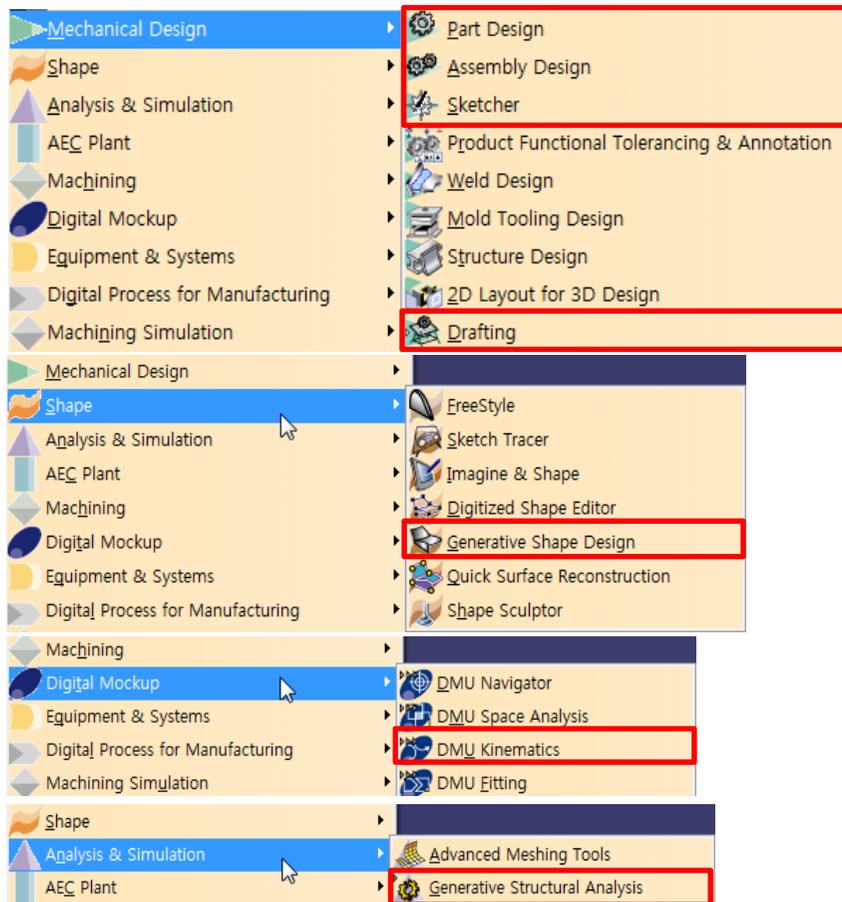
START 메뉴

Solutions & Workbenches



START 메뉴

수업에 사용될 주요 워크벤치



- Sketcher
 - 설계를 위한 스케치
- Part Design
 - 3D 부품 설계
- Assembly Design
 - 설계된 부품들을 조립
- Drafting
 - 2D 도면을 생성
- Generative Shape Design
 - Wireframe, surface 를 이용하여 설계
- DMU Kinematics
 - 조립된 모델의 구동 확인
- Generative Structural Analysis
 - 하중/경계조건을 적용하여 모델 해석

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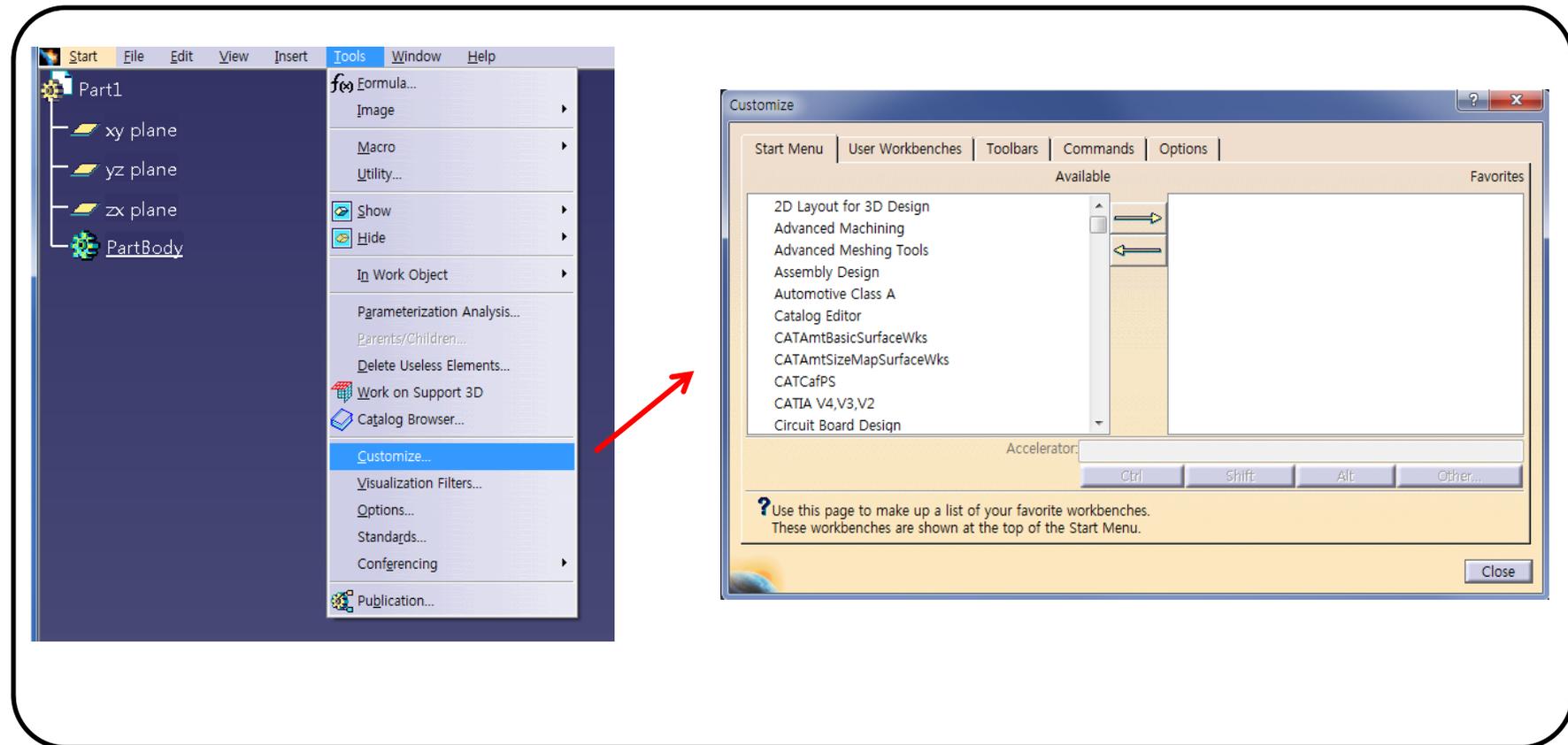
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사용자 정의 (CUSTOMIZE)

사용자정의(customize) 옵션

- 워크벤치 메뉴, 툴바, 단축키, 언어 등에 대한 설정 가능

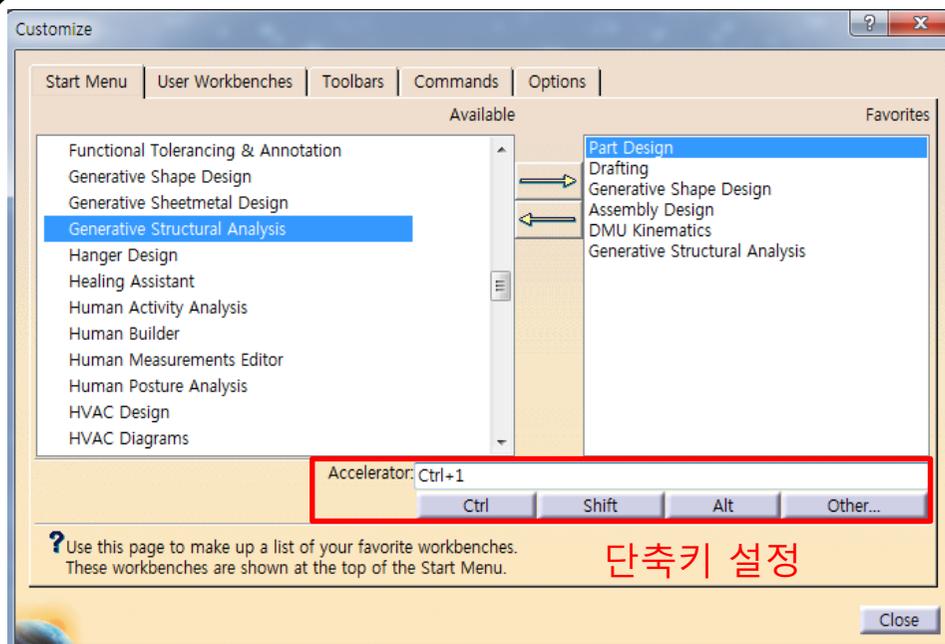
- Tools → Customize



사용자 정의 (CUSTOMIZE)

Start menu

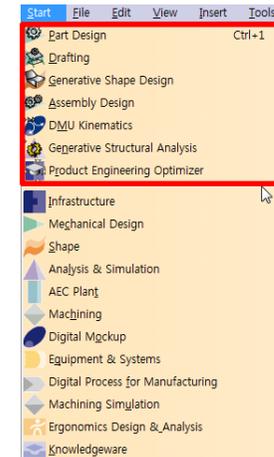
- 빠른 워크벤치 실행 가능



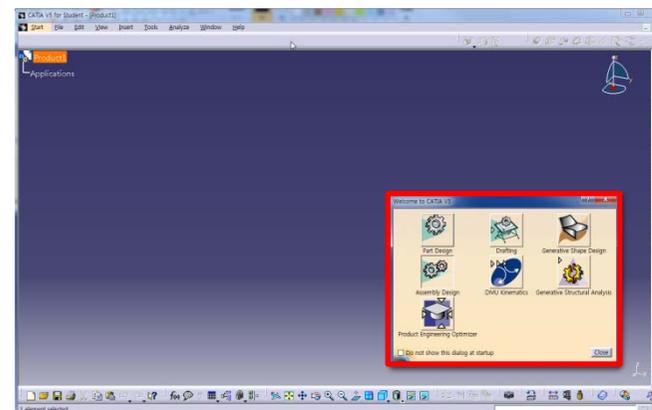
설정 전



설정 후



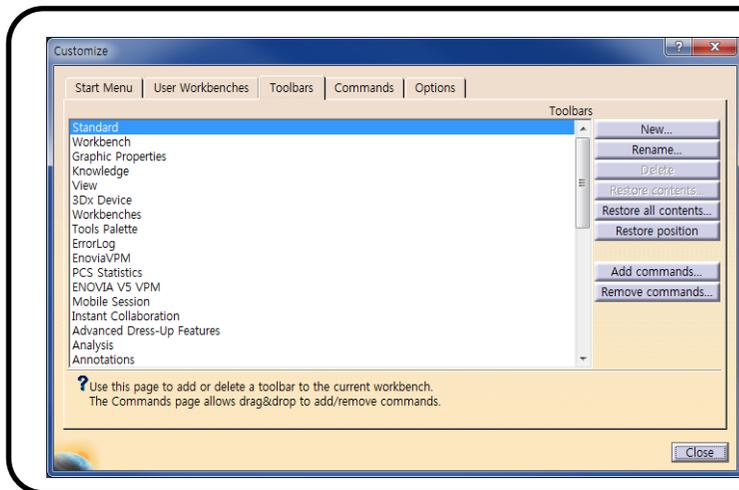
시작화면



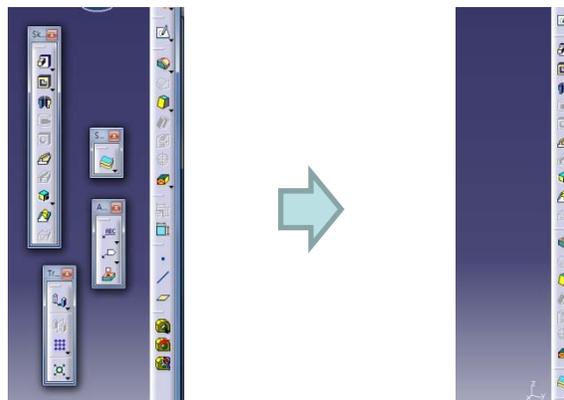
사용자 정의 (CUSTOMIZE)

Toolbars

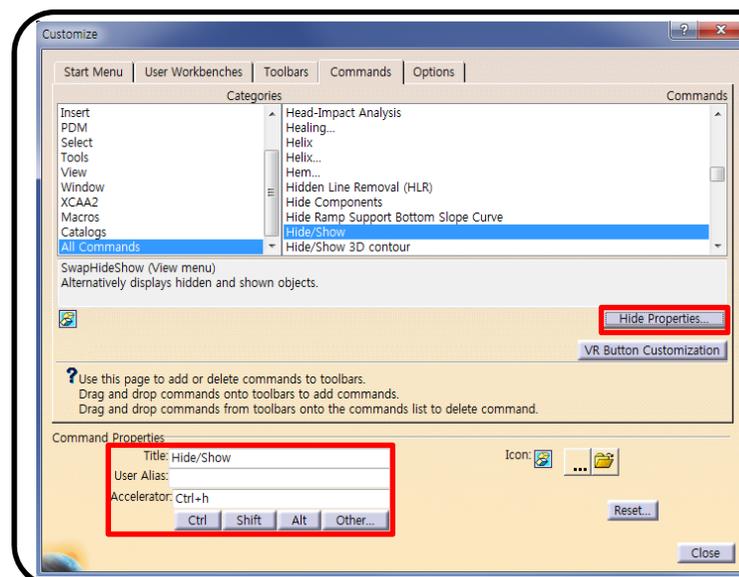
- 툴바의 생성 및 위치 조정



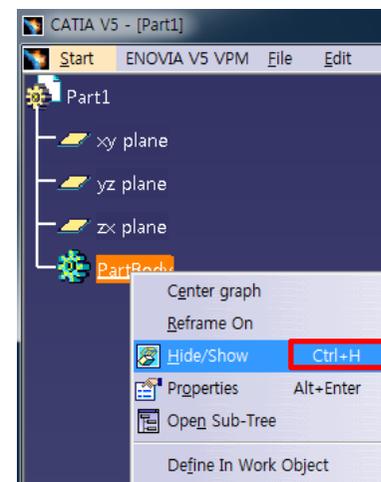
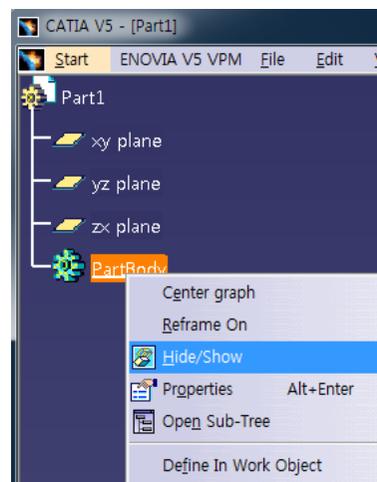
Restore position : Toolbar 원위치



Commands

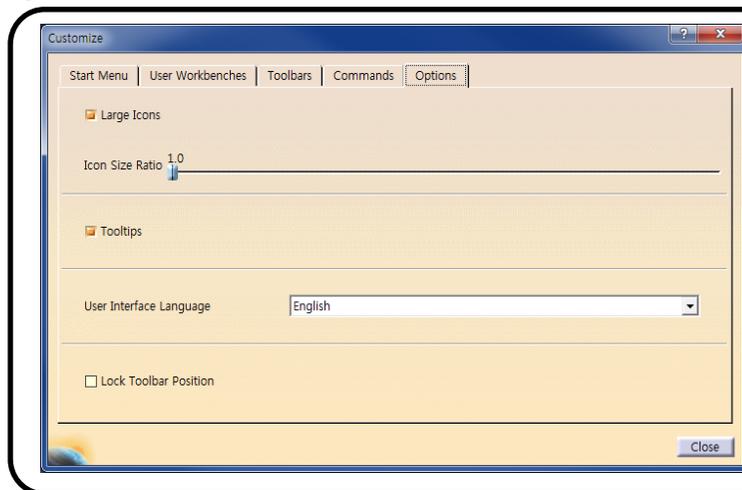


단축키 설정

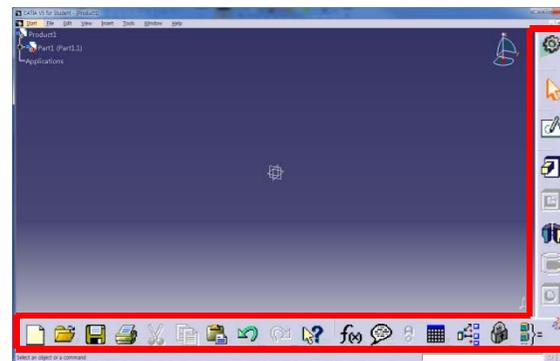


사용자 정의 (CUSTOMIZE)

Options



Icon Size Ratio = 2.8



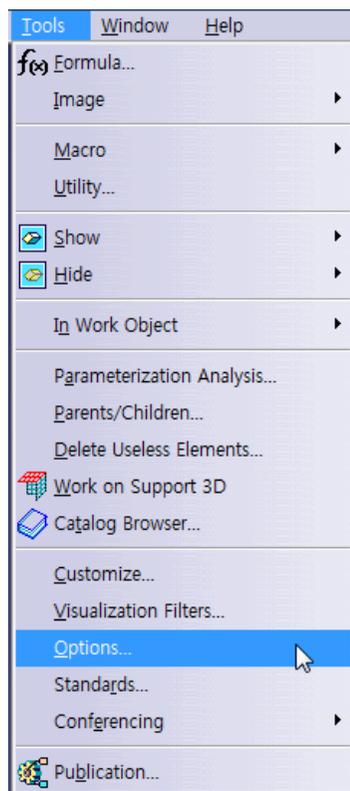
Tooltips



옵션 (OPTIONS)

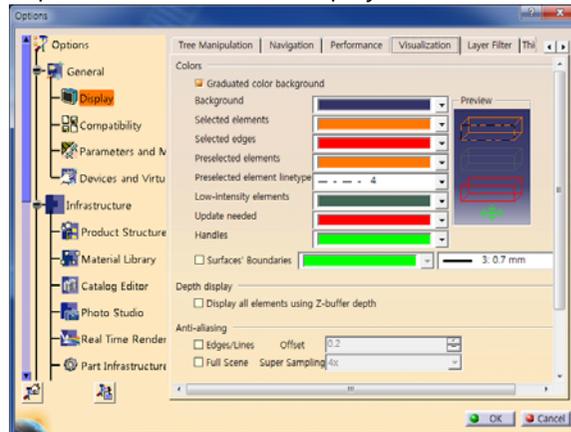
그 외 다양한 옵션 설정

- Tool → Options



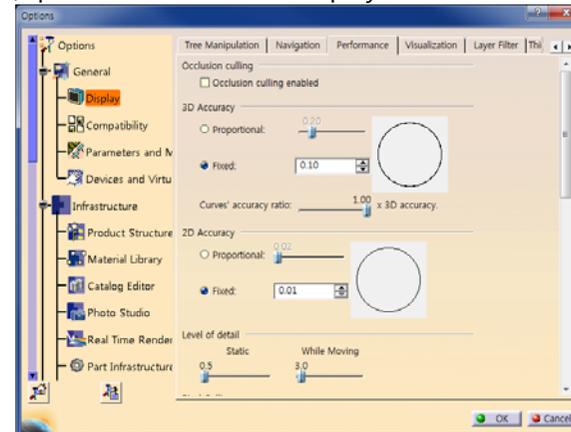
색상

(Options → General → Display → Visualization)



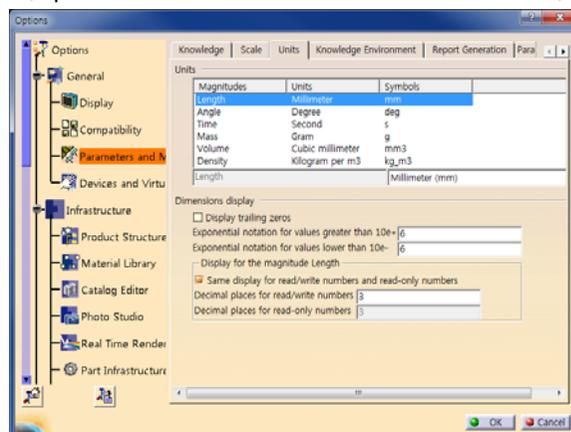
그래픽 표현

(Options → General → Display → Performance)



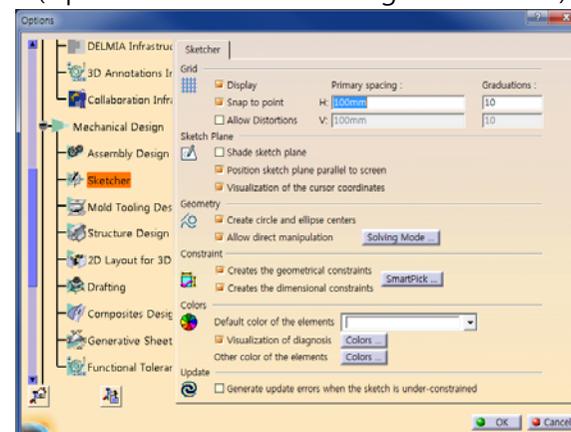
단위

(Options → General → Parameters... → Units)



스케치 옵션

(Options → Mechanical Design → Sketcher)



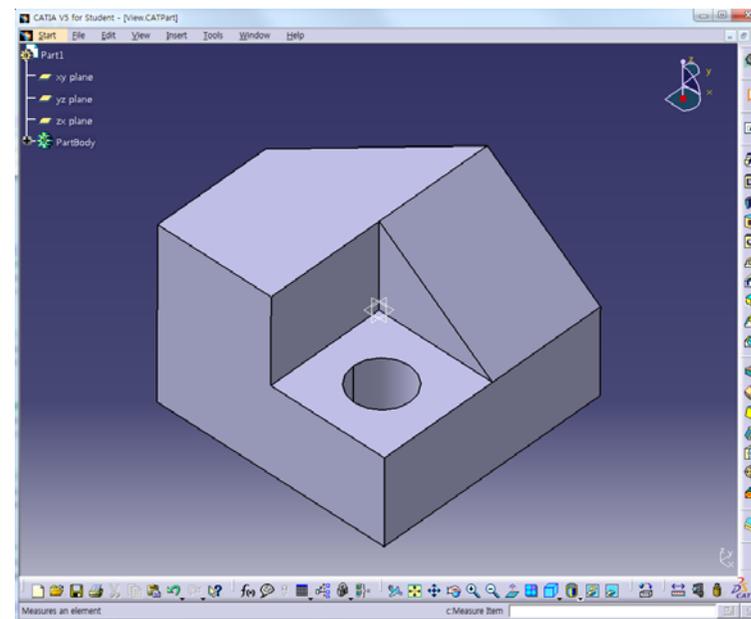
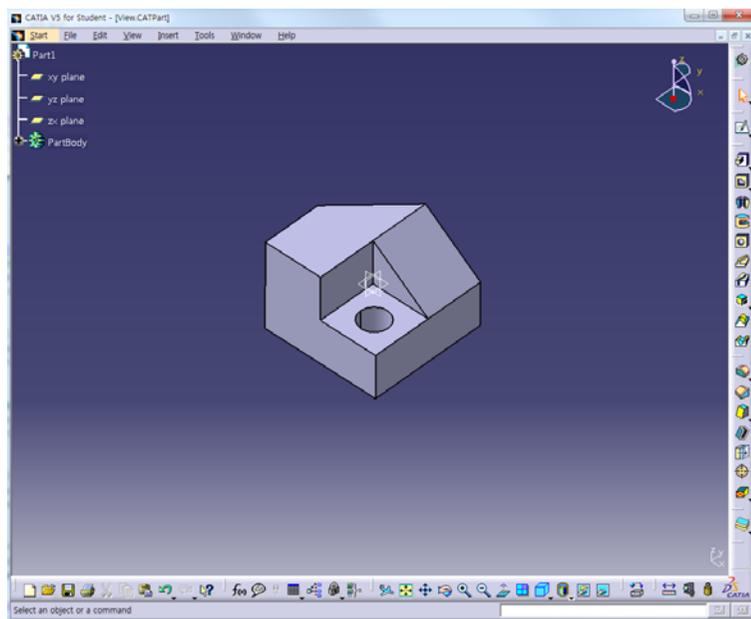
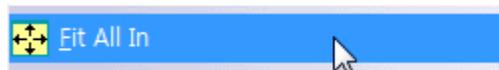
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VIEW (FIT ALL IN)

화면에 꼭 차게 보여줌

- View → Fit All In

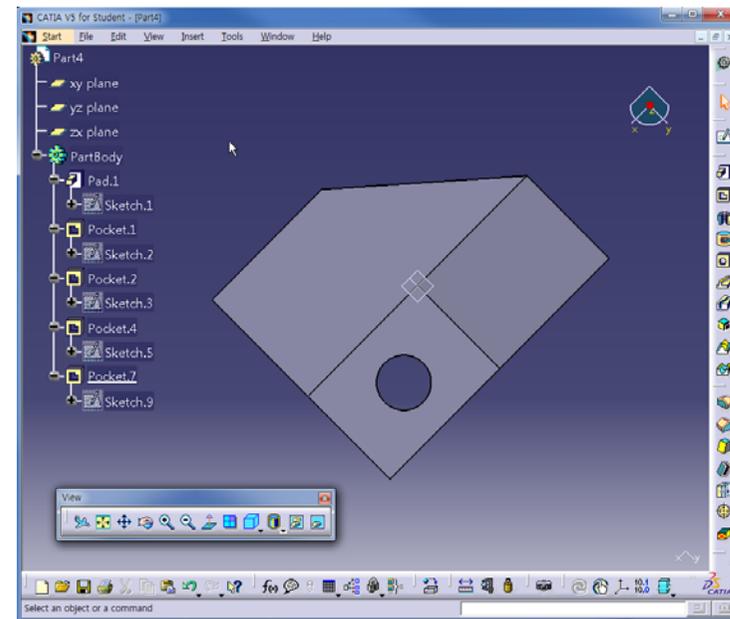
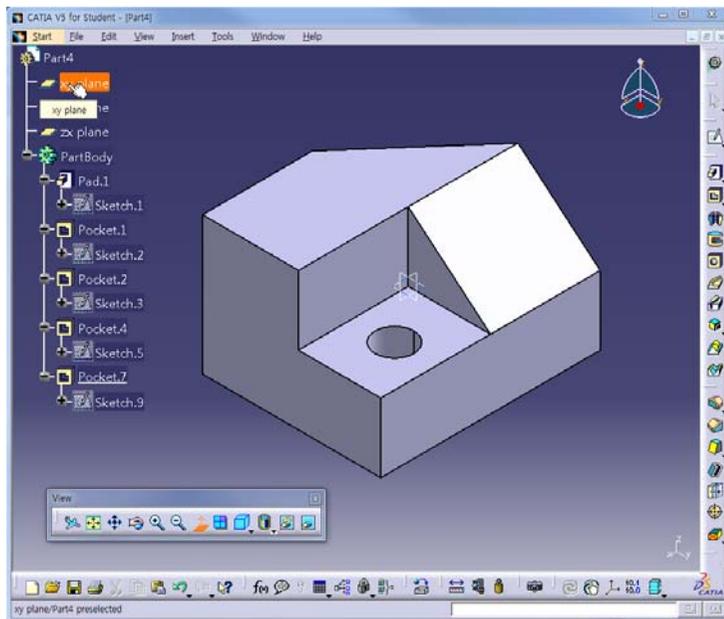


화면 하단의 툴바 이용 가능

VIEW (NORMAL VIEW)

선택한 평면에 수직한 화면을 보여줌

- View → Modify → Normal View 



화면 하단의 툴바 이용 가능

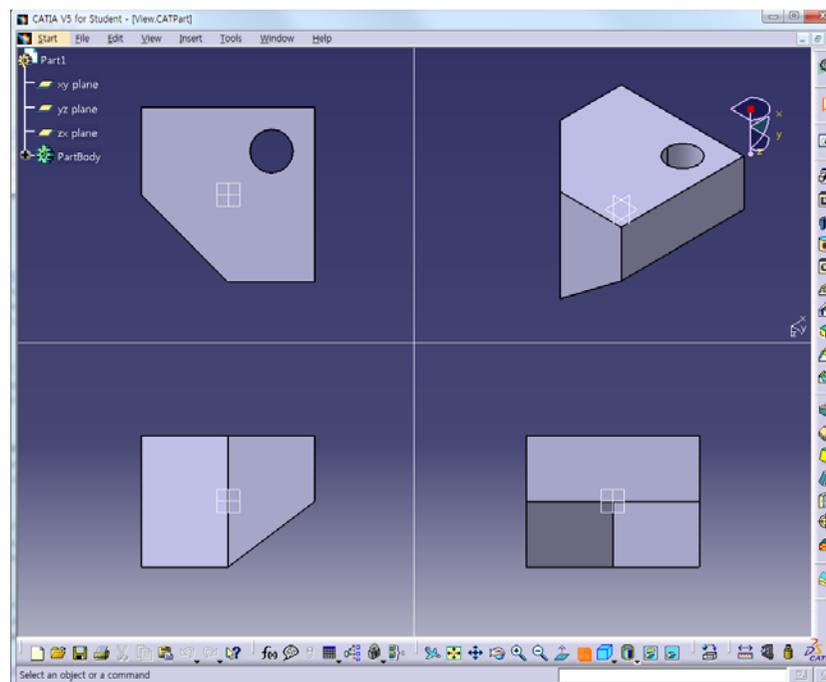
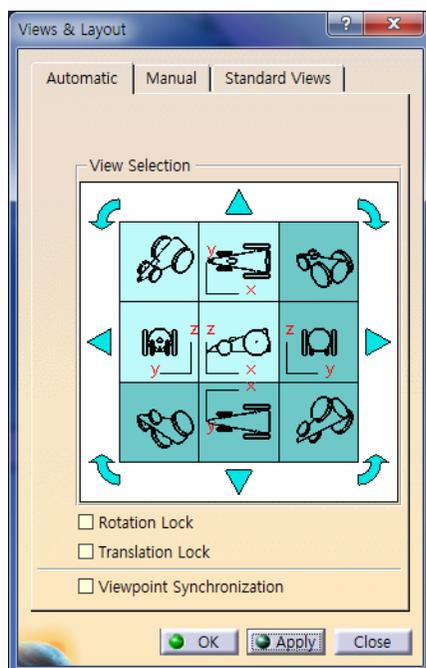
VIEW (CREATE MULTI-VIEW)

모델의 여러 위치의 화면을 나누어 보여줌

- View → Navigation Mode → Multi-View Customization

Multi-View Customization...

원하는 배치 조정 가능



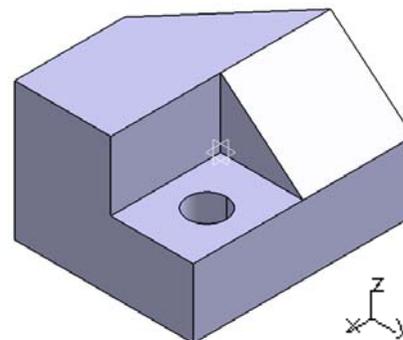
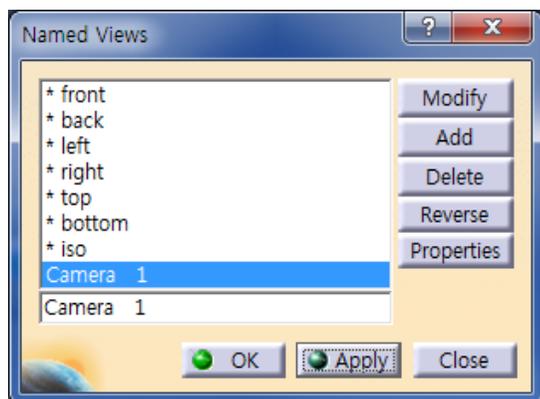
화면 하단의 툴바 이용 가능

VIEW (QUICK VIEW)

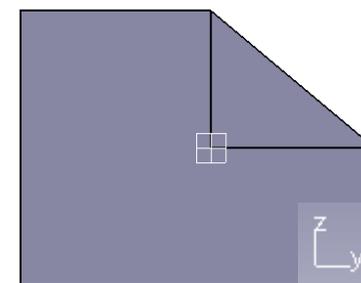
Top, ISO, Side 등의 view로 형상을 배치시킬 때 사용

- View → Named Views 

더블클릭 혹은 Apply버튼을 클릭하여 사용
(Add를 이용해 사용자가 원하는 화면위치 저장도 가능)

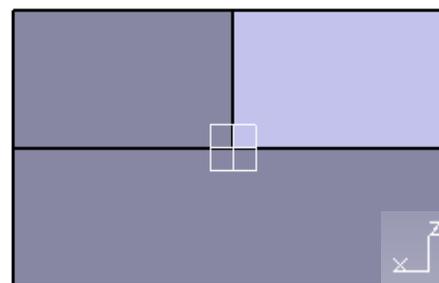
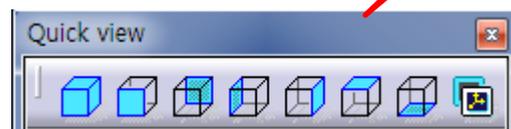


 Isometric View

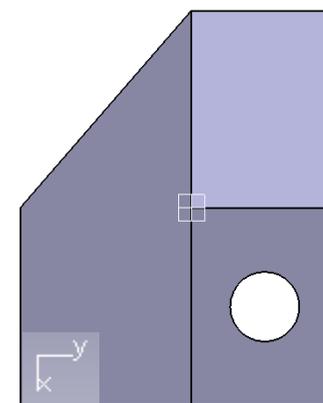


 Front View

화면 하단의 툴바 이용 가능



 Right View

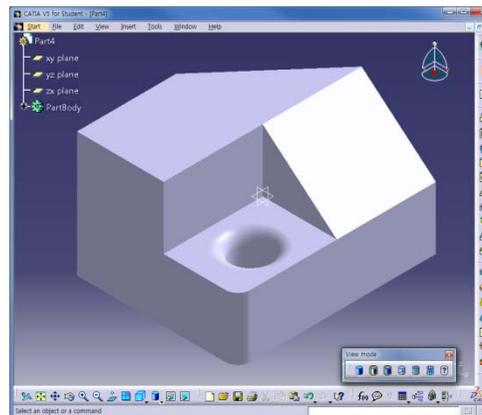
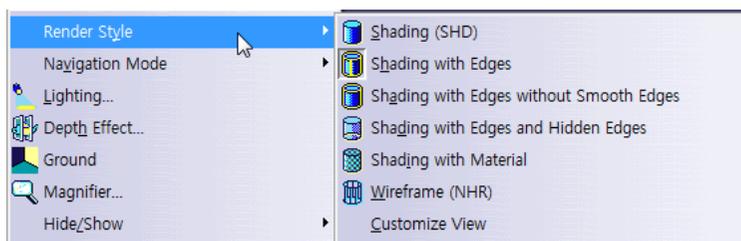


 Top View

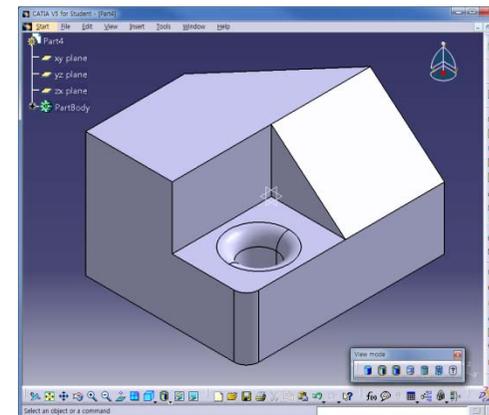
VIEW (VIEW MODE)

모델의 표현 방법 설정

- View → Render Style

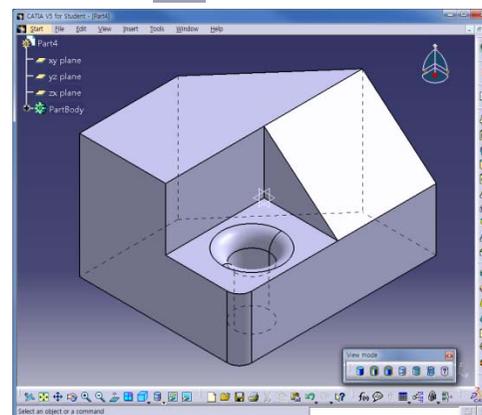


Shading

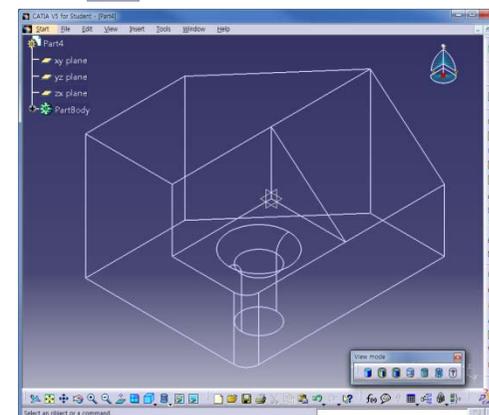


Shading with Edges

화면 하단의 툴바 이용 가능



Shading with Edges and Hidden Edges



Wireframe

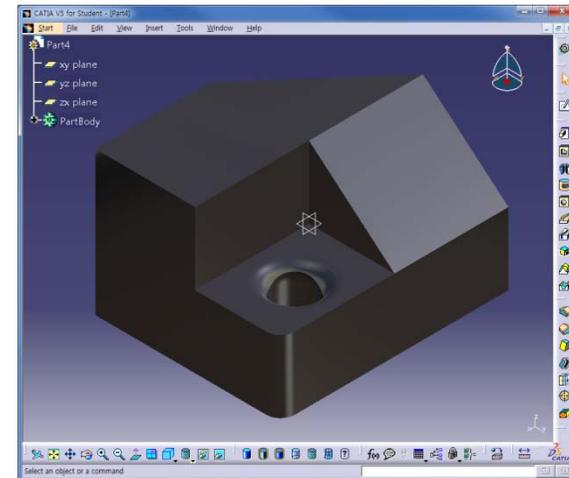
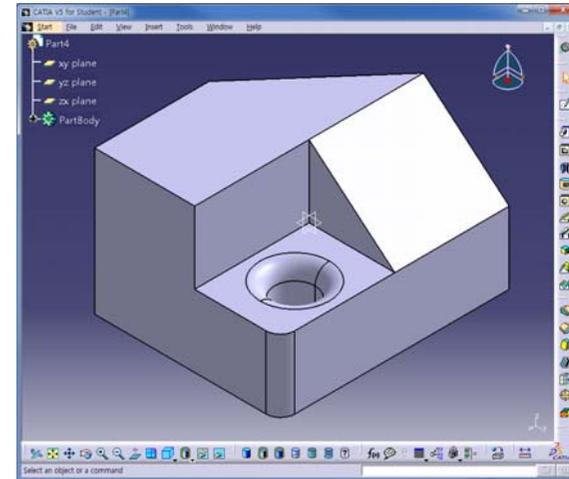
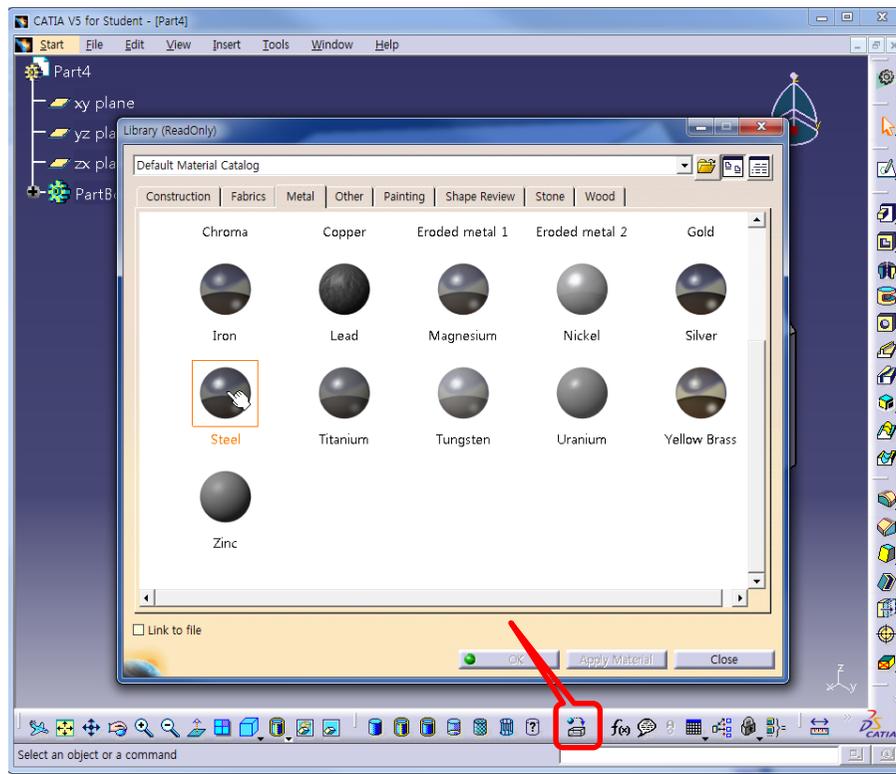
VIEW (VIEW MODE)

모델에 적용한 재료를 표현

- View → Render Style → Shading with Material



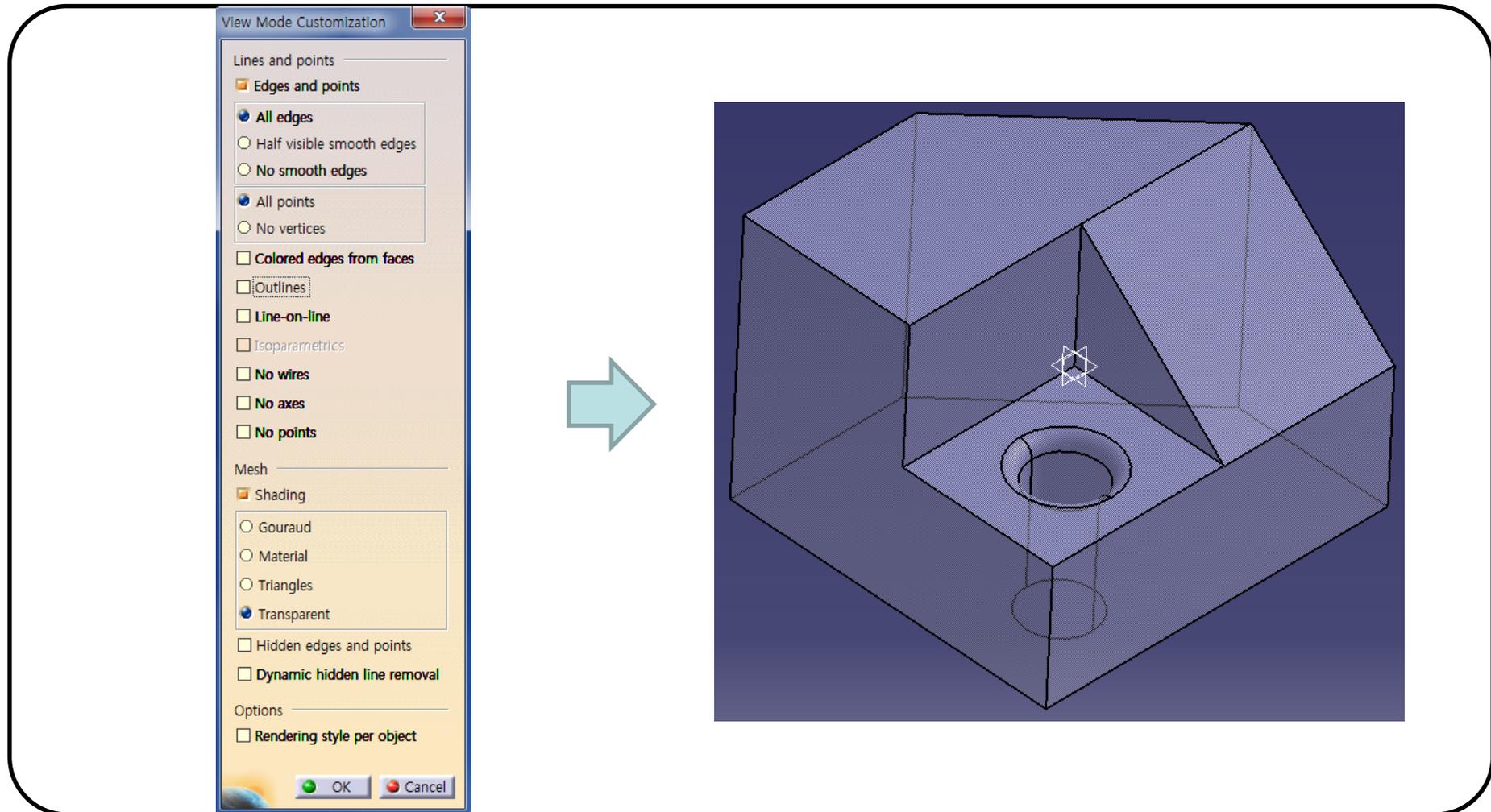
재료입력 (재료특성 포함)



VIEW (VIEW MODE)

모델의 표현 방법 설정 : 사용자 정의

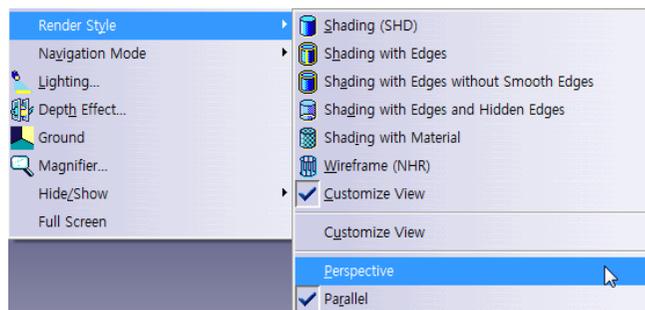
- View → Render Style → Customize View



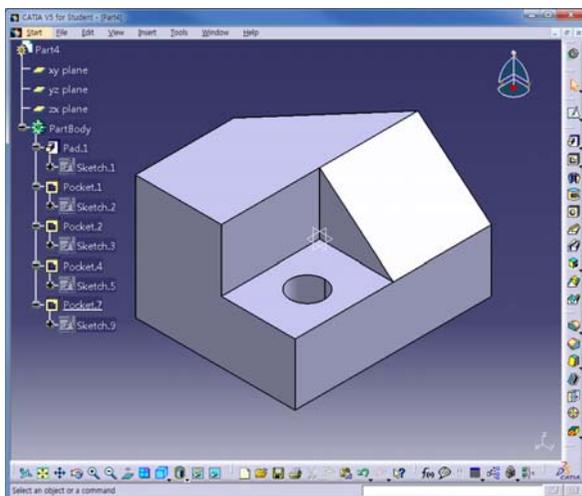
VIEW (PARALLEL/PERSPECTIVE)

원근감을 고려한 화면 배치

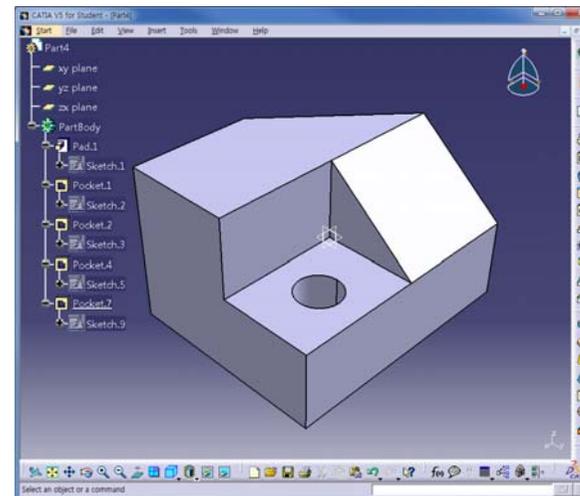
- View → Render Style → Perspective/Parallel



- Perspective: 원근감을 고려한 사실적인 화면구성
- Parallel: 원근감을 고려하지 않은 모델링을 위한 화면 구성



Parallel

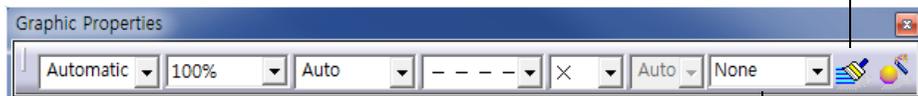
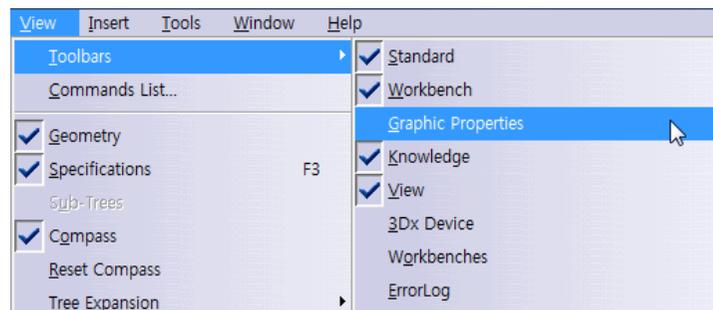


Perspective

VIEW (GRAPHIC PROPERTIES)

Geometry의 색, 투명도 등을 조절

- View → Toolbars → Graphic Properties



Painter

Layer 설정

Point 종류 설정

Line/Curve 두께 설정

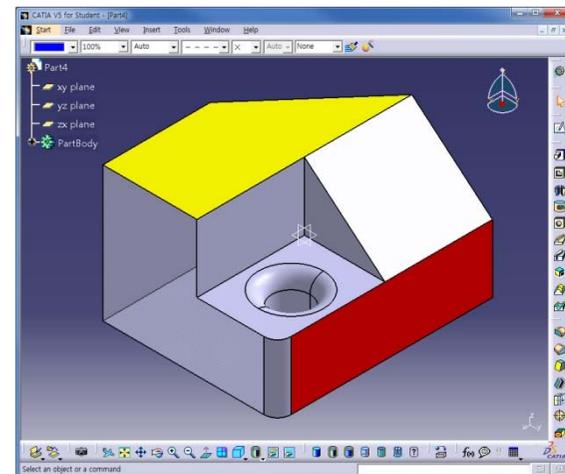
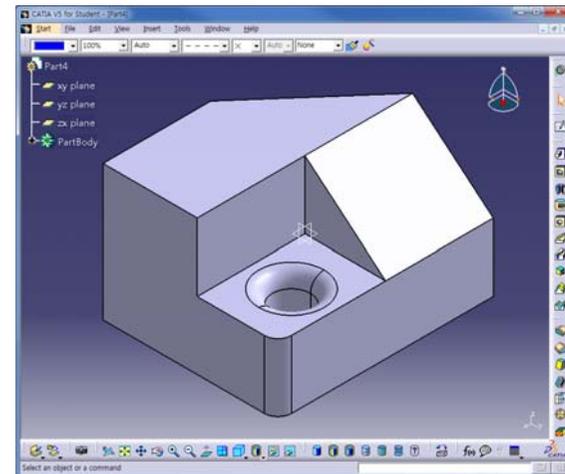
Line/Curve 종류 설정

투명도 설정

Solid/Surface를 구성하는 면의 색상 설정



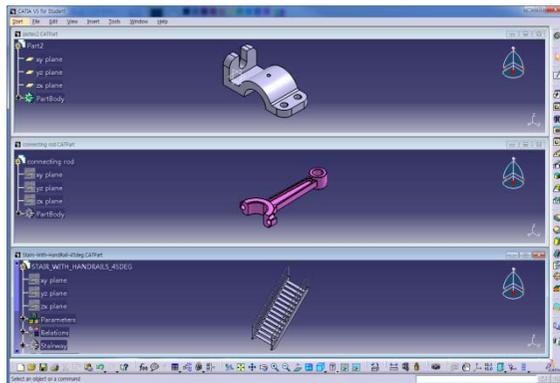
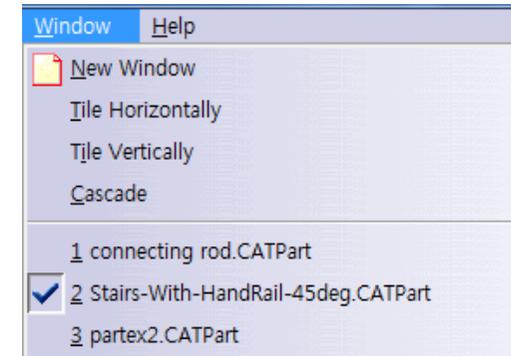
painter를 이용하면 다른 부분에 적용된 색상을 복사해서 적용 가능



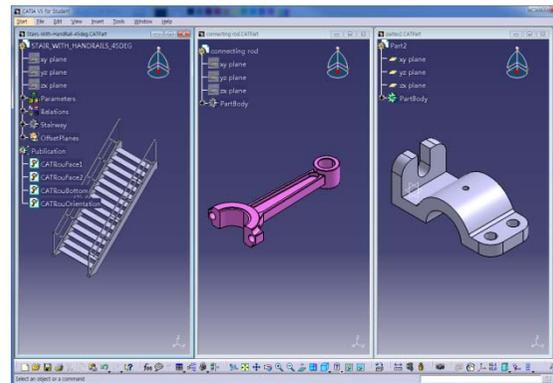
WINDOW 메뉴

메뉴의 Window 기능을 이용해 현재 CATIA 창에 열려있는 파일 분할 배치

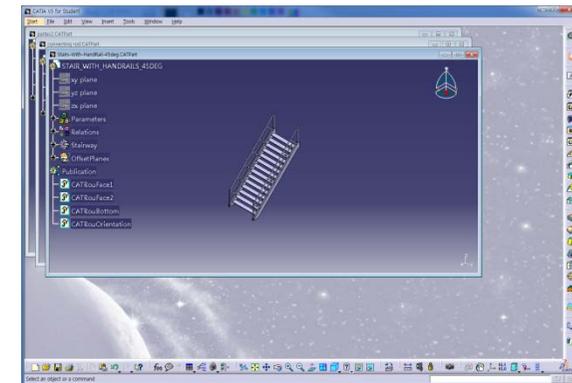
- New Window : 활성화된 작업을 복사하여 새로운 화면 생성
- Tile Horizontally : 현재 작업중인 파일을 수평 배열
- Tile Vertically : 현재 작업중인 파일을 수직 배열
- Cascade : 현재 작업중인 파일을 계단식 배열



Tile Horizontally



Tile Vertically

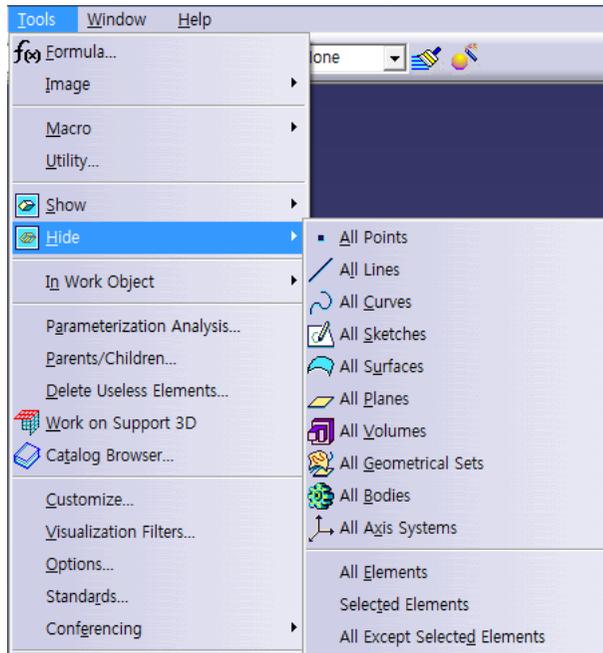


Cascade

HIDE/SHOW

Hide/Show : 선택한 물체를 숨기거나 보여줌

Part Design → Tools → Show/Hide

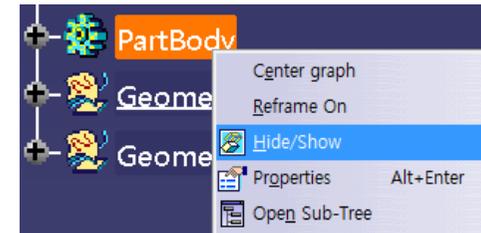


또는 화면 하단의 툴바 이용 가능

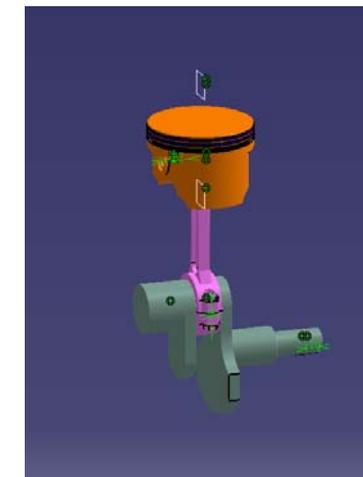
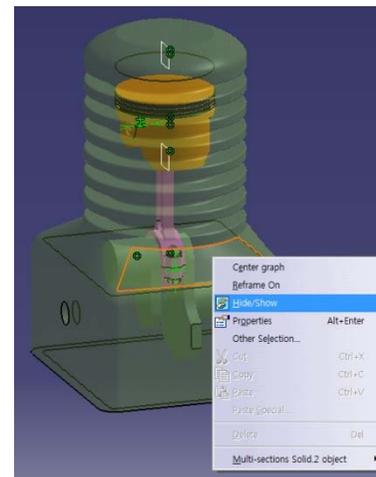


Hide/Show
숨겨져 있는 모델 확인

트리에서 오른쪽 마우스 클릭



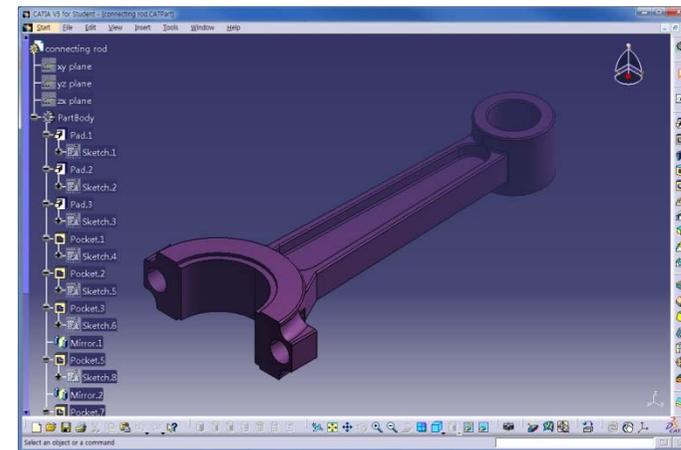
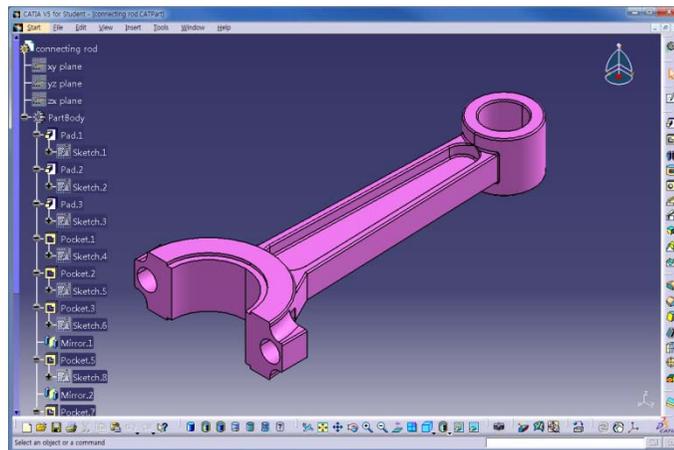
숨기고자 하는 대상에 마우스 오른쪽 버튼에서 클릭



작업 트리의 이동/확대/축소

작업 트리의 흰색 가지 부분이나 오른쪽 하단의 x/y/z 축을 선택하게 되면 Geometry의 색이 어둡게 바뀌면서 작업 트리의 조정이 가능하게 된다.

이럴 경우 다시 작업 트리의 흰색 가지나 오른쪽 하단의 x/y/z 축을 선택하면 원 상태로 돌아가게 된다.



트리 조정 중 작업 트리가 사라질 경우

- 마우스 오른쪽 클릭 -> Reframe graph
- 화면 하단 메뉴 중  클릭

CONTENTS

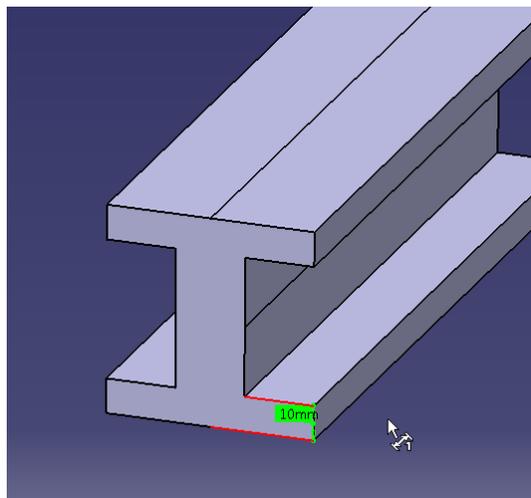
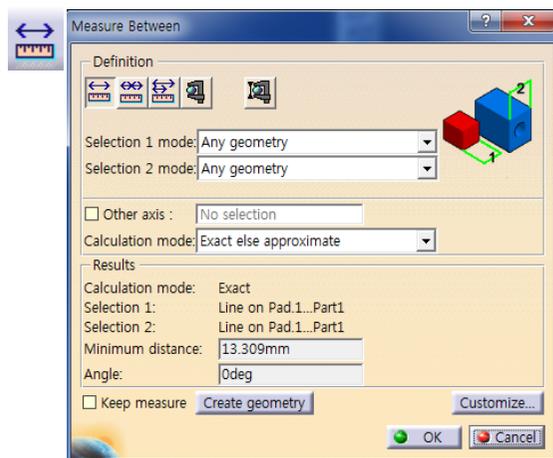
- Introduction
 - 수업방향
 - 시작하기: Start, File → Open, Save
 - 기본설정: Tools → Customize, Options
 - 작업화면 설정: View, Window
 - **Measure / Help Document**

MEASURE

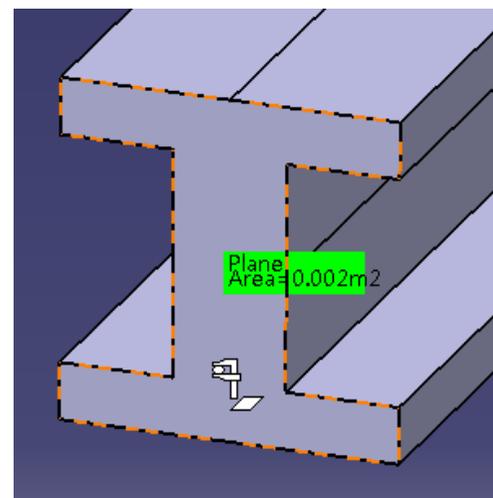
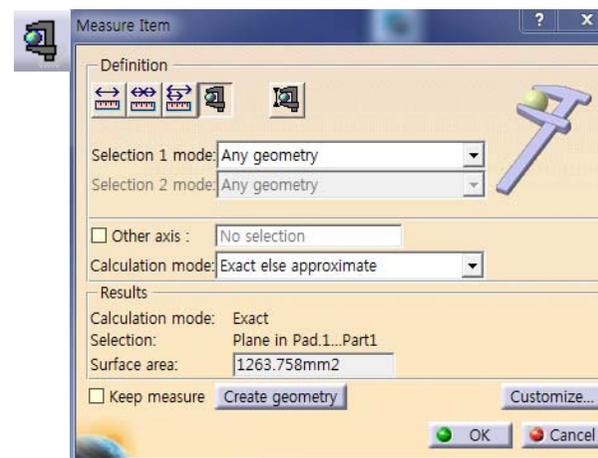
측정 아이콘을 통해 여러 치수 측정 가능



Measure Between



Measure Item

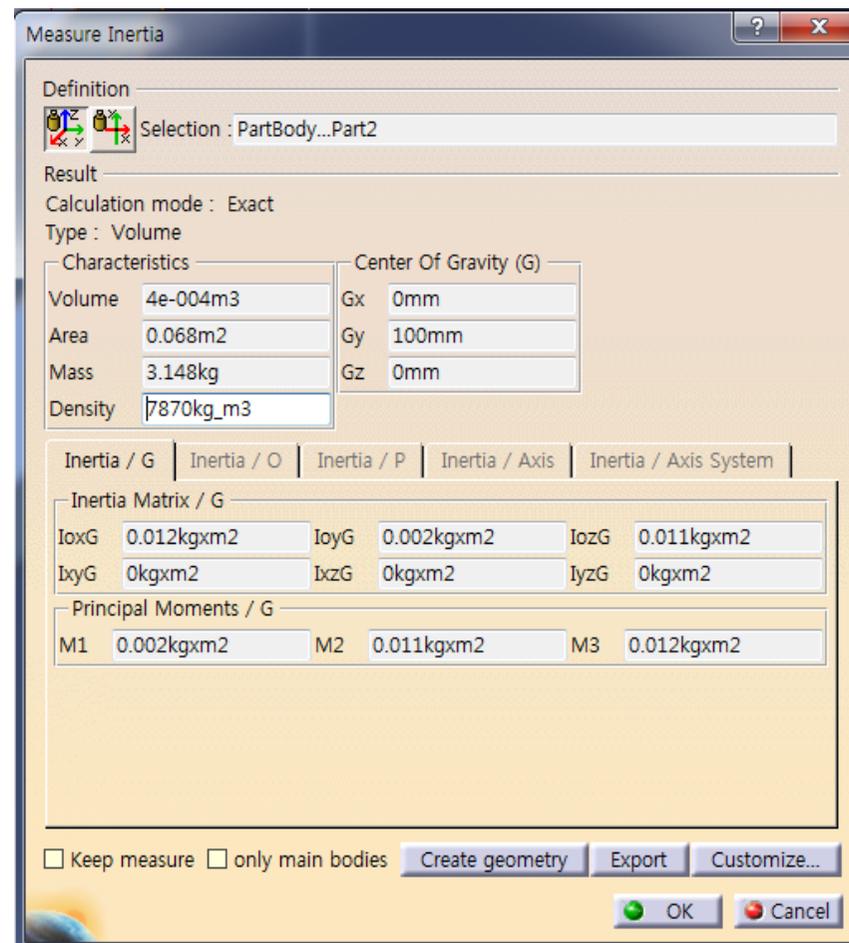
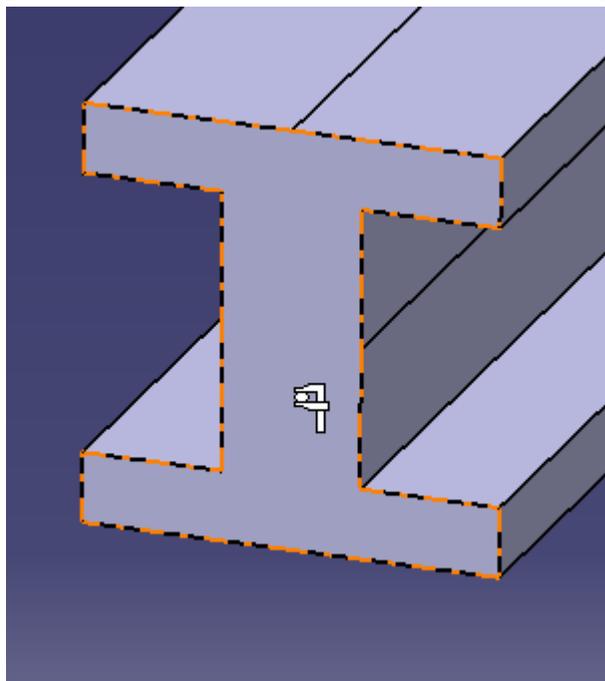
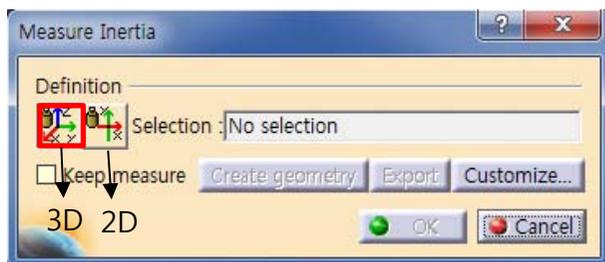


MEASURE

측정 아이콘을 통해 여러 치수 측정 가능



Measure Inertia

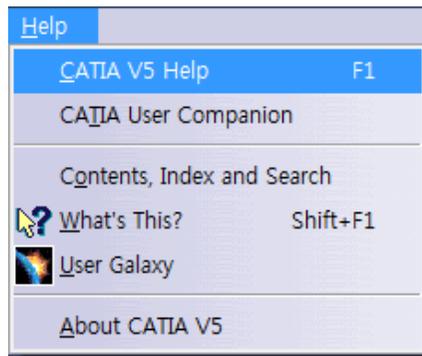


HELP DOCUMENT

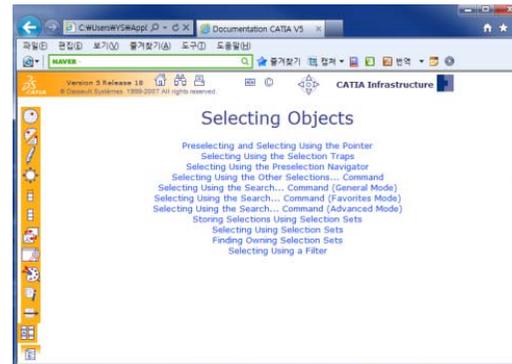
CATIA의 Help Document 사용방법

- Help Document 사용방법 1

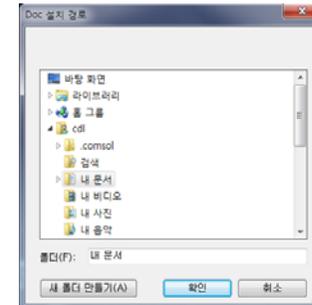
메뉴를 통해 실행



설치가 되어 있을 경우



설치가 되어 있지 않을 경우



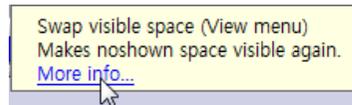
온라인으로 볼 수 있는 곳(R19)
- <http://maruf.ca/files/catiahelp>

- Help Document 사용방법 2 (설치가 되어 있을 경우)

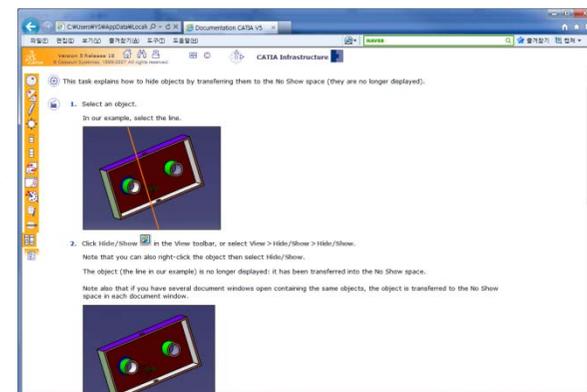
아래의 물음표 버튼 클릭 후
궁금한 툴바 아이콘 클릭



간단한 설명과 함께
More info... 가 나타남



클릭 시 해당 도움말로 이동



GRABCAD.COM

모델 관련 참고 사이트 (Community → Library)

