

CAD TEAM PROJECT

**‘쉽게’ 보다 ‘어렵게’**

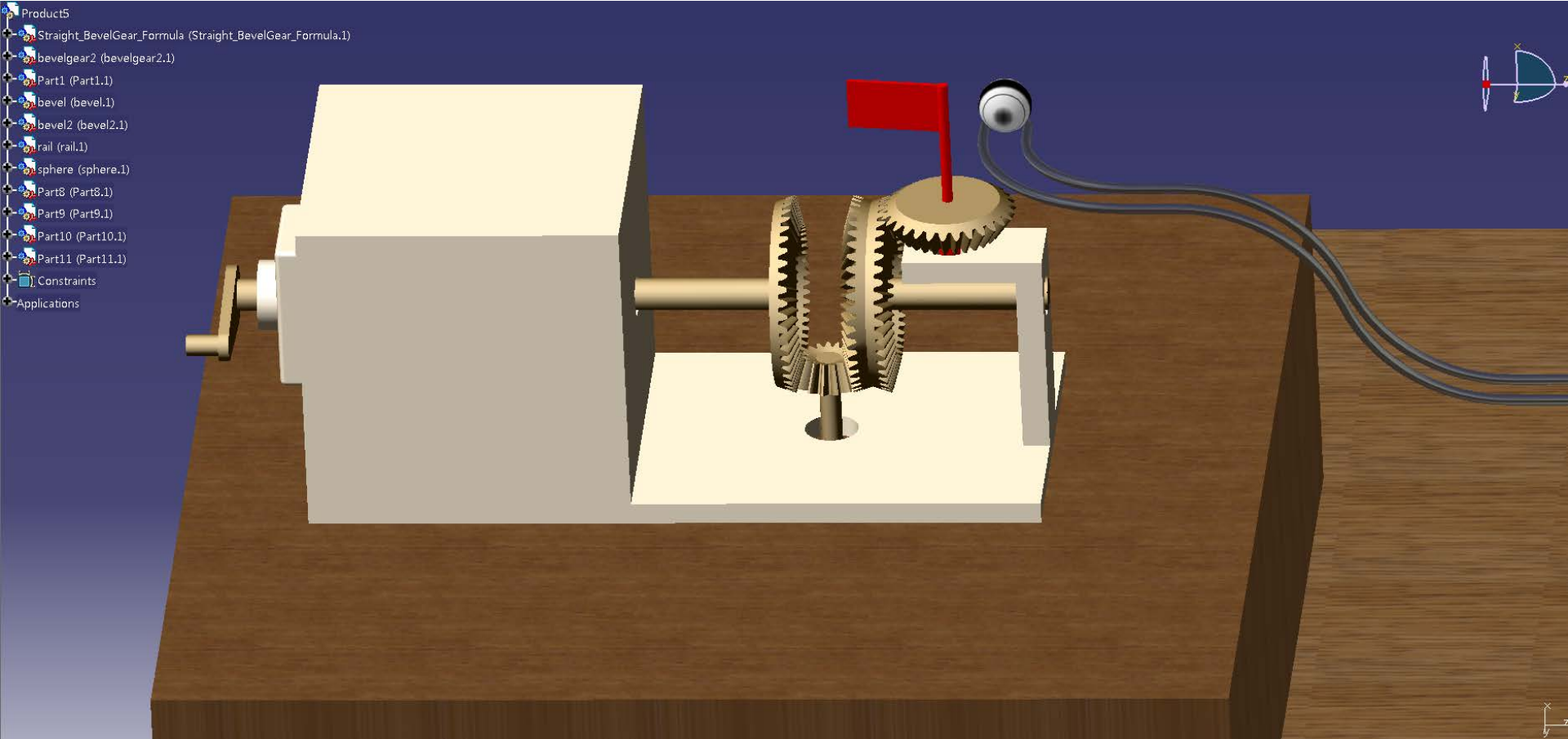
2015012633 김성은  
2016033645 신동훈

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- Q&A

# 작품 선정 배경

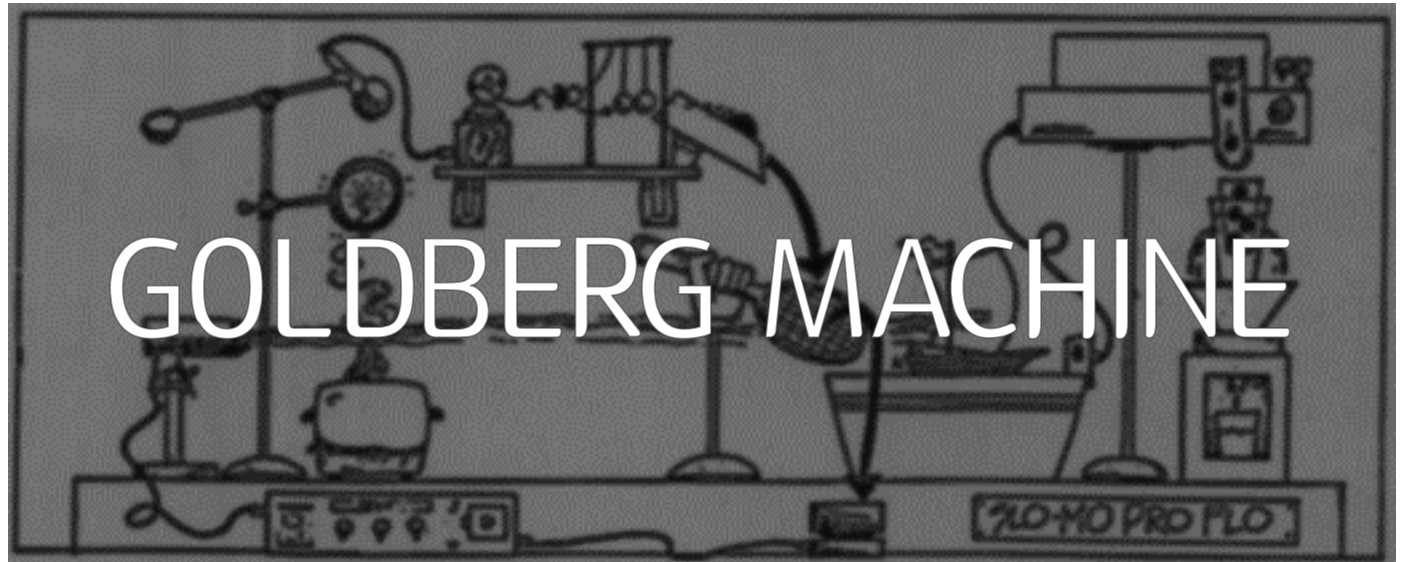


# 팀명 선정 배경

“

‘쉽게’ 보다  
‘어렵게’

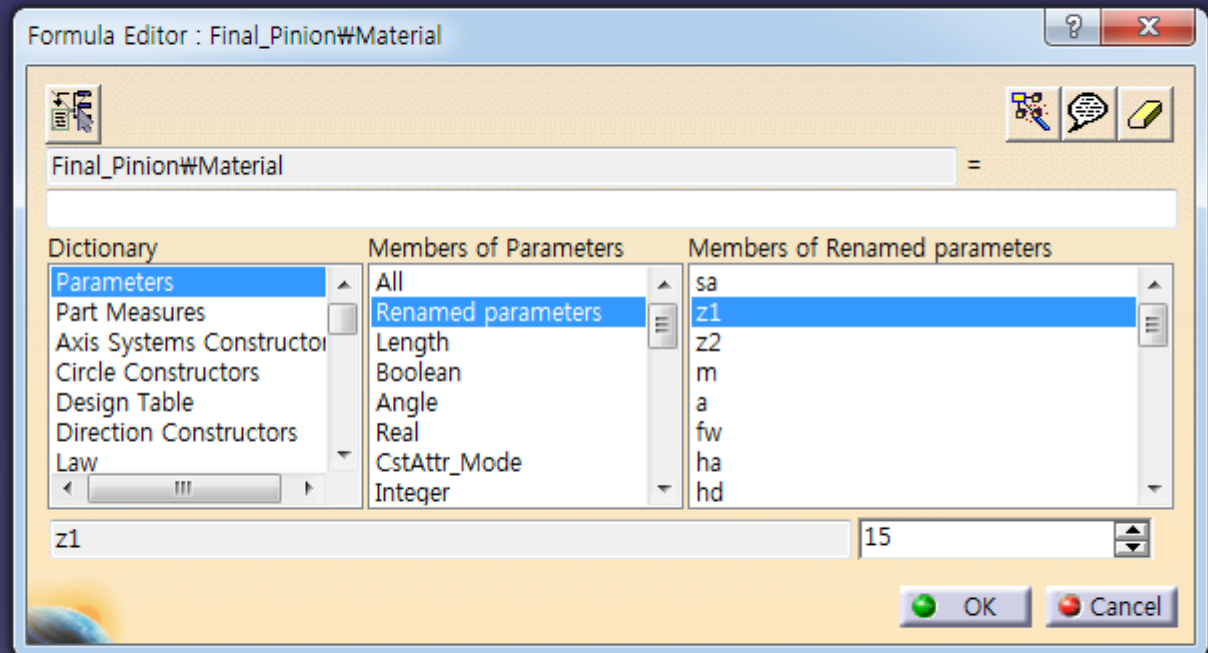
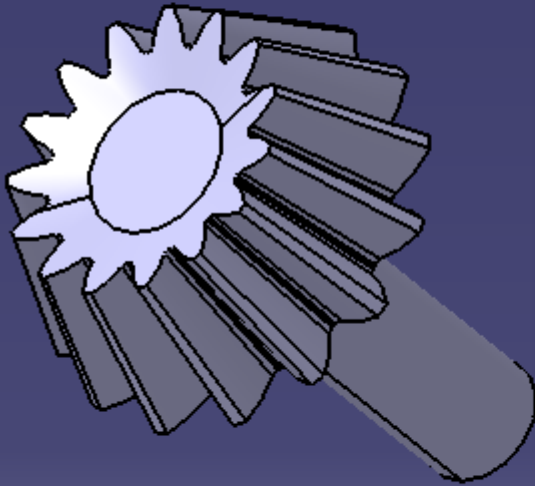
”



# 제작과정

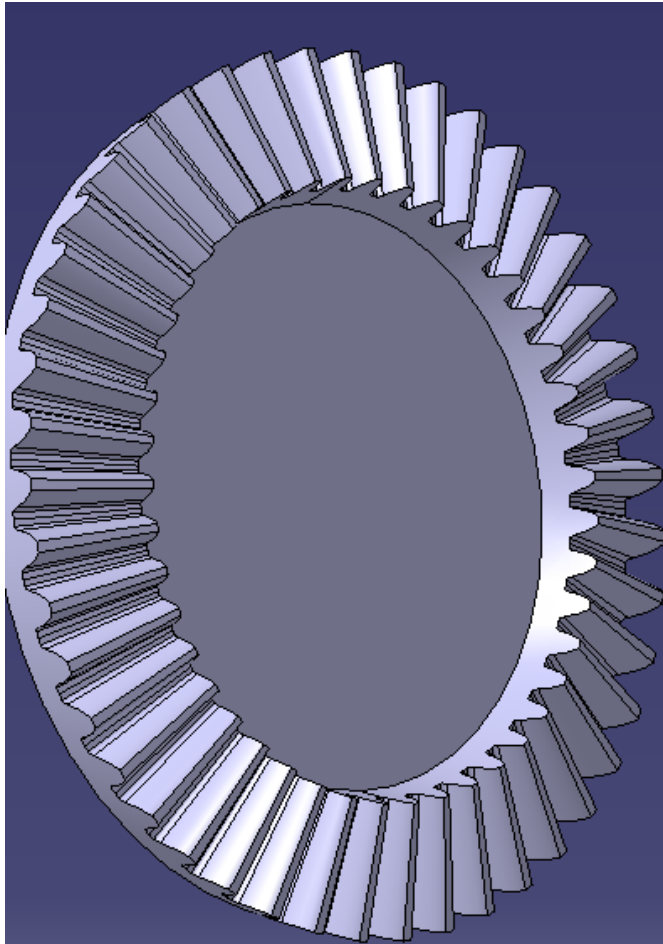
- Gear

Sa ( □□ ) / Z1 ( □□□ □□ ) / Z2 ( □□ □□ ) / m ( □□ ) / a ( □□□ ) / fw ( □□ )

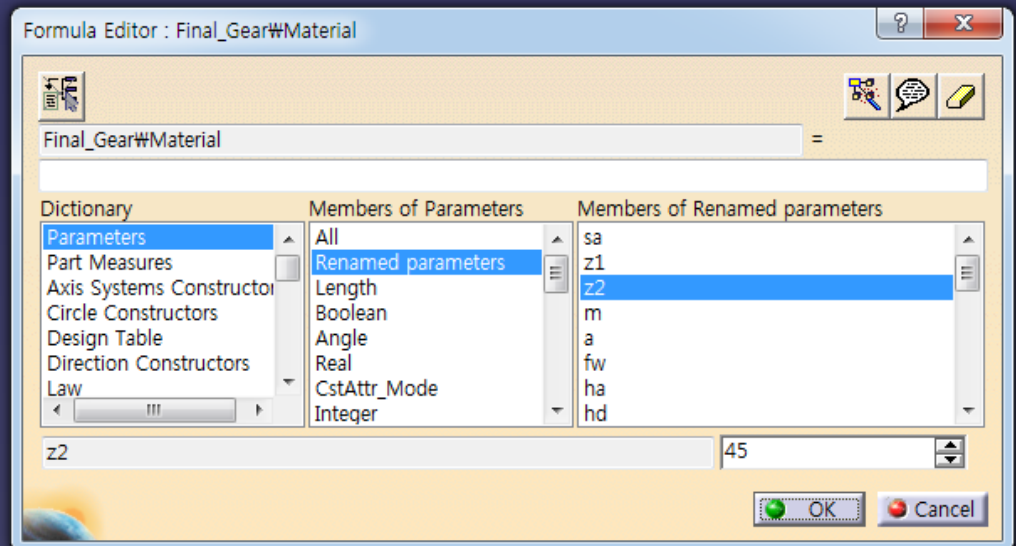


# 제작과정

- Gear



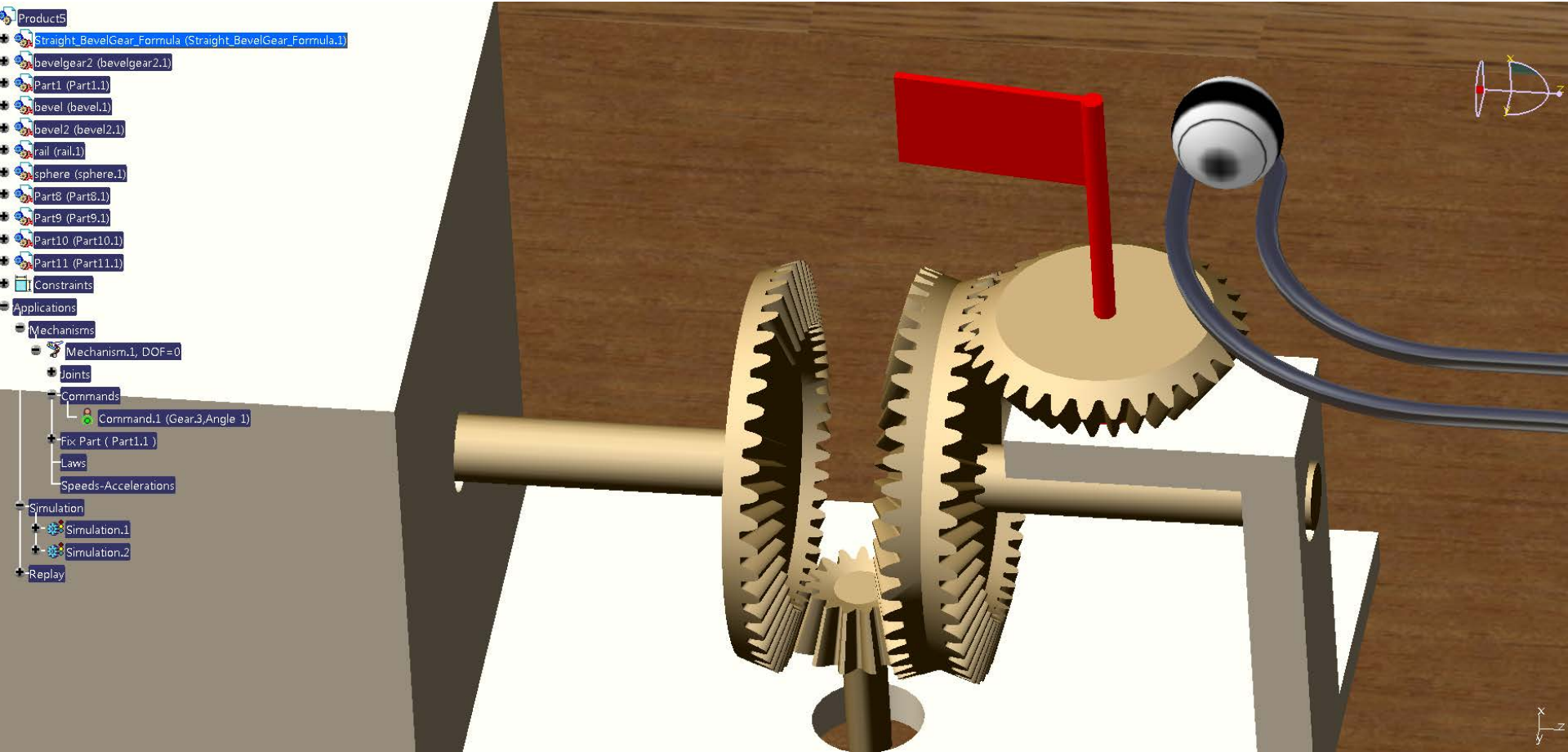
Sa ( □ □ ) / Z1 ( □ □ □ □ □ ) / Z2 ( □ □ □ □ )  
/ m ( □ □ ) / a ( □ □ □ ) / fw ( □ □ )



# 표준 스트레이트 베벨 기어 계산식

기호 & 계산	설명	명칭	요목표	Formula		Modeling		
				피니언	기어	기호 & 계산 공식	설명	
		명칭	값		피니언	기어	피니언	기어
1	축각 ( $\Sigma$ ) (Shaft Angle)		90 °		$\Sigma$		축각 (1 피니언과 기어의 중심축 사이의 각 2 특수경우를 제외하고 90° 사용)	
2	잇수 ( $Z$ ) (Number of Teeth)		26	38	$Z_1$	$Z_2$	잇수 <sub>1</sub>	잇수 <sub>2</sub>
3	모듈 ( $m$ ) (Module)		4 mm		$m$		모듈	
4	압력각 ( $\alpha_0$ ) (Pressure angle)		20 °		$\alpha_0$		압력각	
5	치폭 ( $b$ ) (Face width)		28.40 mm		$b$		치폭 (외단원추거리의 1/3 or 10 * 모듈)	
6	위치결정거리(A) (Pitch Apex to Back)		118 mm	120 mm	$A_1$	$A_2$	위치결정거리 <sub>1</sub>	위치결정거리 <sub>2</sub>
7	치말 높이 ( $h_k$ ) 이끌높이(Addendum)		4 mm		$h_k = 1.0 m$		치말높이 = 1.0 * 모듈	
8	치원 높이 ( $h_f$ ) 이뿌리높이(Dedendum)		5 mm		$h_f = 1.25 m$		치원높이 = 1.25 * 모듈	
9	전치 높이 ( $h$ ) 전체이높이 (Whole Depth)		9 mm		$h = h_k + h_f$		전치높이 = 치말높이+치원높이	
10	피치원지름 ( $d_0$ ) 피치원직경(Outside Pitch Diameter)		$\Phi$ 104	$\Phi$ 152	$d_{01} = m * Z_1$	$d_{02} = m * Z_2$	피치원지름 <sub>1</sub> = 모듈 * 잇수	피치원지름 <sub>2</sub> = 모듈 * 잇수
11	피치원추각 ( $\delta_0$ ) (Pitch Angle)		34.38 °	55.62 °	$\delta_{01} = \tan^{-1}\{\sin\Sigma/Z_1 + \cos\Sigma\}$	$\delta_{02} = \Sigma - \delta_{01}$	피치원추각 <sub>1</sub> = $\tan^{-1}\{\sin\Sigma / \text{잇수}_1 / \text{잇수}_2 + \cos\Sigma\}$	피치원추각 <sub>2</sub> = $\Sigma - \text{피치원지름}_1$
12	외단원추거리 ( $R_0$ ) 원추거리 (Cone Distance)		92.087 mm		$R_0 = d_{02} / (2 * \sin \delta_{02})$		외단원추거리 = 피치원지름 <sub>2</sub> / (2 * sin 피치원추각 <sub>2</sub> )	
13	치원각 ( $\theta_f$ ) 이뿌리각 (Dedendum Angle)		3.1079 °		$\theta_f = \tan^{-1}(h_f / R_0)$		치원각 = $\tan^{-1}$ (치원 높이 / 외단원추거리)	
14	치말각 ( $\theta_k$ ) 이끌각 (Addendum Angle)		2.4872 °		$\theta_k = \tan^{-1}(h_k / R_0)$		치말각 = $\tan^{-1}$ (치말 높이 / 외단원추거리)	
15	치저원추각 ( $\delta_{k1}$ ) 이끌 원추각 (Face Angle)		36.87 °	58.11 °	$\delta_{k1} = \delta_{01} + \theta_k$	$\delta_{k2} = \delta_{02} + \theta_k$	치저원추각 <sub>1</sub> = 피치원추각 <sub>1</sub> + 치원각	치저원추각 <sub>2</sub> = 피치원추각 <sub>2</sub> + 치원각
16	치선원추각 ( $\delta_{f1}$ ) 이뿌리 원추각 (Roof Angle)		31.27 °	52.51 °	$\delta_{f1} = \delta_{01} - \theta_f$	$\delta_{f2} = \delta_{02} - \theta_f$	치선원추각 <sub>1</sub> = 피치원추각 <sub>1</sub> - 치말각	치선원추각 <sub>2</sub> = 피치원추각 <sub>2</sub> - 치말각
17	외단치선원지름 ( $d_k$ ) (Outside Diameter) 바깥지름		110.6025 mm	156.5175 mm	$d_{k1} = d_{01} + 2 h_k \cos\delta_{01}$	$d_{k2} = d_{02} + 2 h_k \cos\delta_{02}$	외단치선원지름 <sub>1</sub> = 피치원지름 <sub>1</sub> + 2치말높이COS피치원추각 <sub>1</sub>	외단치선원지름 <sub>2</sub> = 피치원지름 <sub>2</sub> + 2치말높이COS피치원추각 <sub>2</sub>

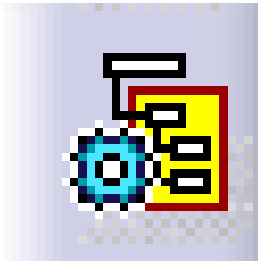
# MODELING & KINEMATICS



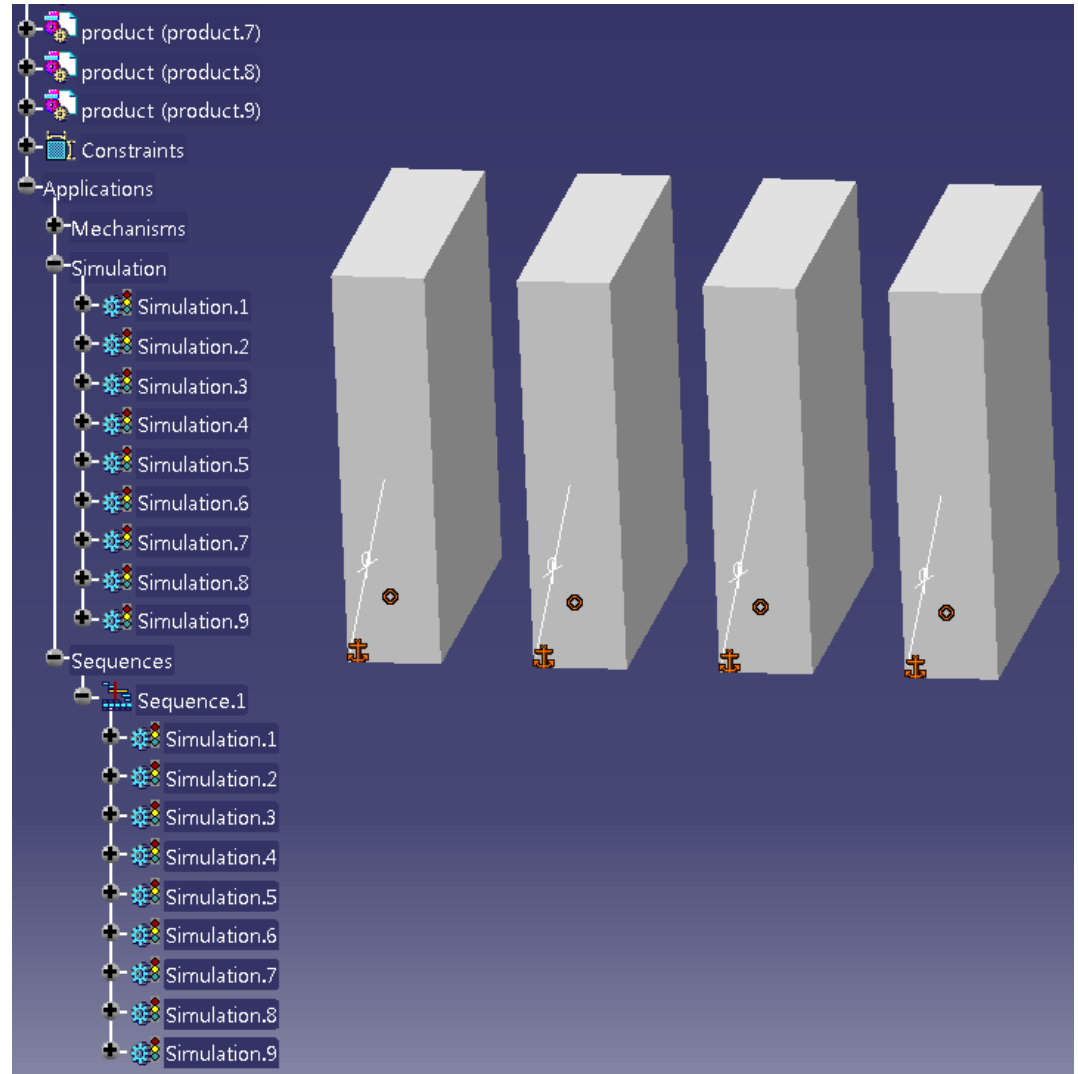


# 제작과정

- Domino



'Import Sub  
Mechanisms



# 제작과정

## • Domino

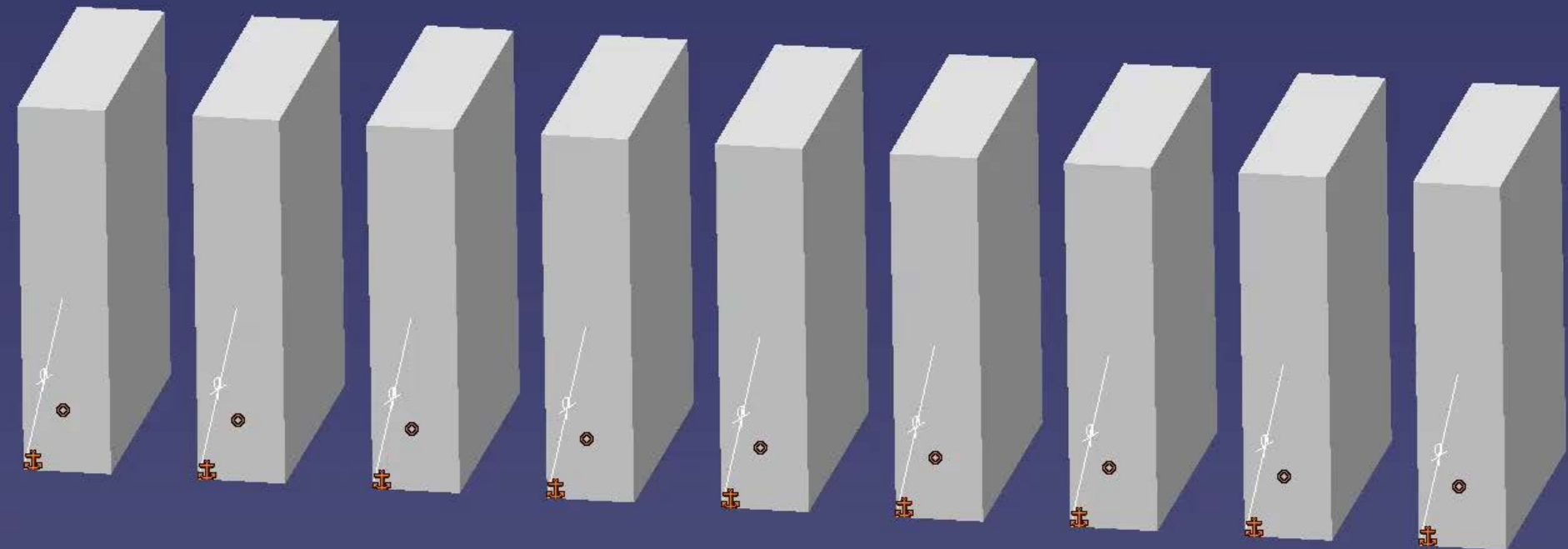
The screenshot displays the Domino software interface. On the left, a tree view shows the project structure under 'Product3', including 'Product1 (Product1.1)', 'product (product.1) through (product.9)', 'Constraints', 'Applications', 'Mechanisms', 'Simulation', 'Replay', and 'Sequences' (with 'Sequence.1' selected). The main workspace shows a 3D model of a mechanical assembly with several grey rectangular components. A 'Player' window is visible at the top right, showing a progress bar at 0s and playback controls. The 'Edit Sequence' dialog box is open in the foreground, featuring two tabs: 'Edit Action' and 'Edit Analysis'. The 'Edit Action' tab is active, showing a list of 'Action in session' (Simulation.1 to Simulation.9) and a table for 'Action in Sequence'.

Step	Action	Duration (s)	Delay (s)
1	Simulation.1	1	0
1	Simulation.2	1	0.2
1	Simulation.3	1	0.4
1	Simulation.4	1	0.6
1	Simulation.5	1	0.8
1	Simulation.6	1	1
1	Simulation.7	1	1.2
1	Simulation.8	1	1.4
1	Simulation.9	1	1.6

Below the table are buttons for 'Move Up', 'Move Down', 'Merge Up', and 'Merge Down'. At the bottom, there are input fields for 'Action duration (s)' (0) and 'Action delay (s)' (0), along with a 'Reset duration' button. The 'Action add mode' section has three radio buttons: 'Create last step and add' (selected), 'Add in last step', and 'Iterative create last step and add'. There is also a checkbox for 'Highlight the simulated action(s)'. The dialog box has 'OK' and 'Cancel' buttons at the bottom right.

# MODELING & KINEMATICS

- Domino



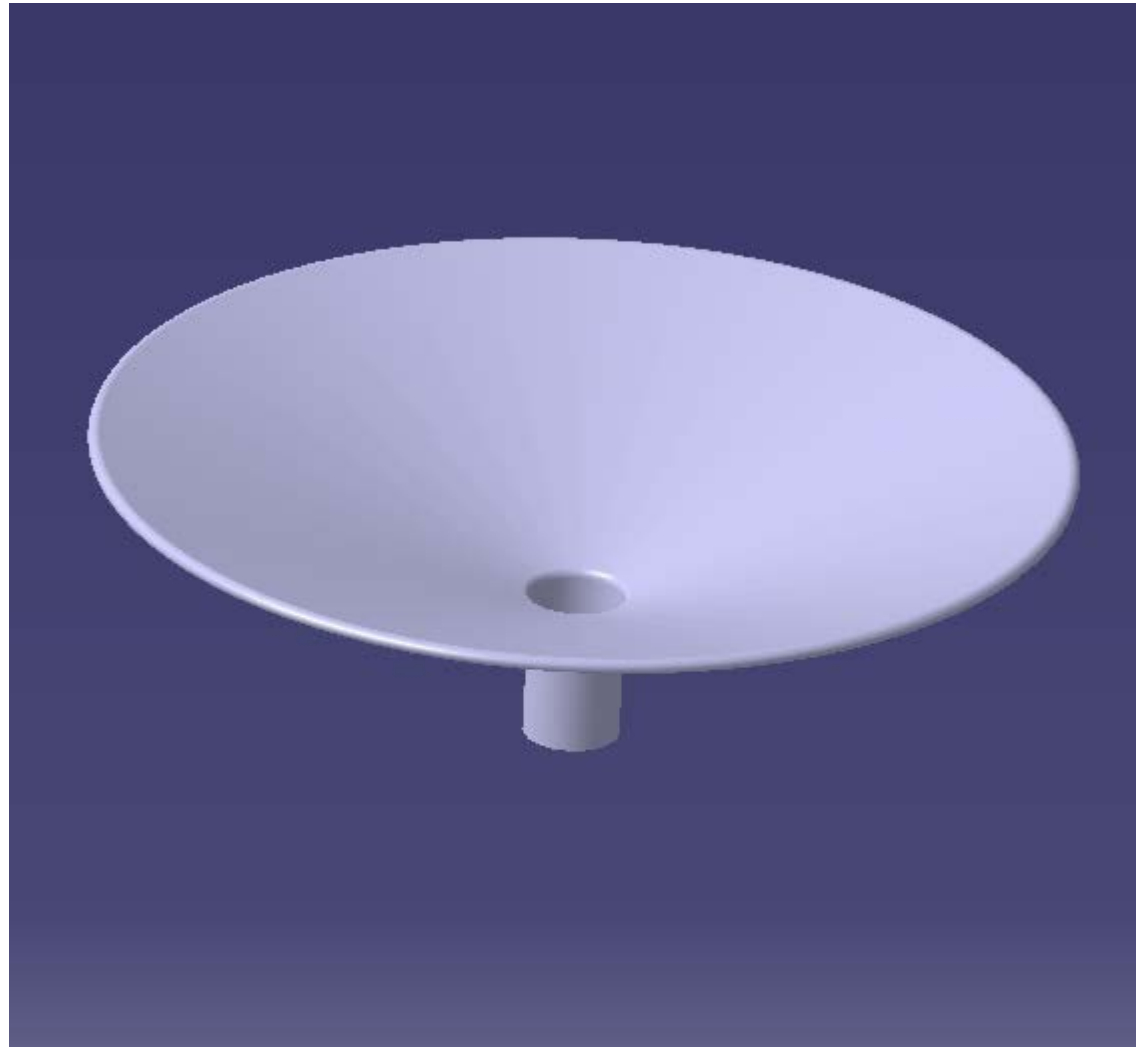
# 제작과정

- Scale



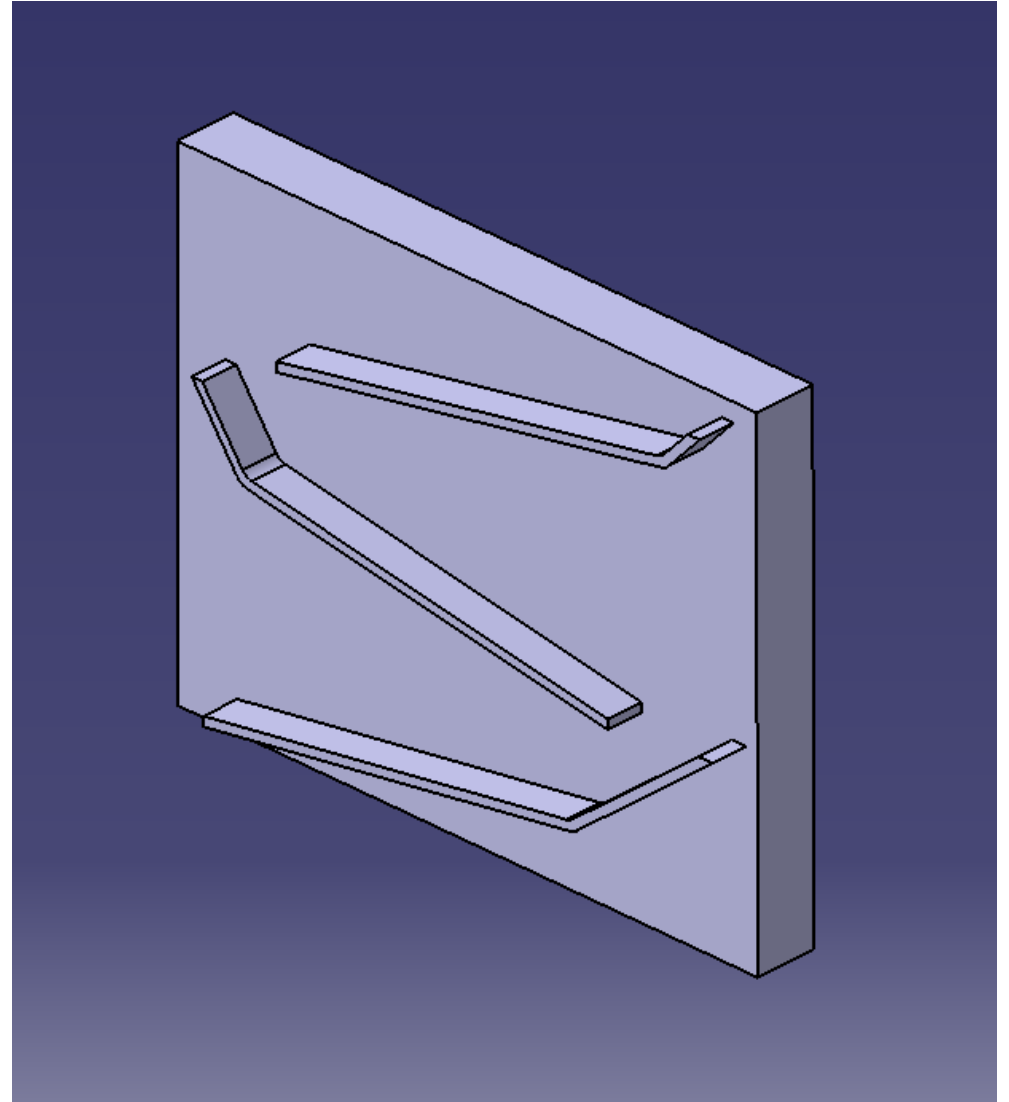
# 제작과정

- Funnel



# 제작과정

- Wall



# 제작과정

- Fan

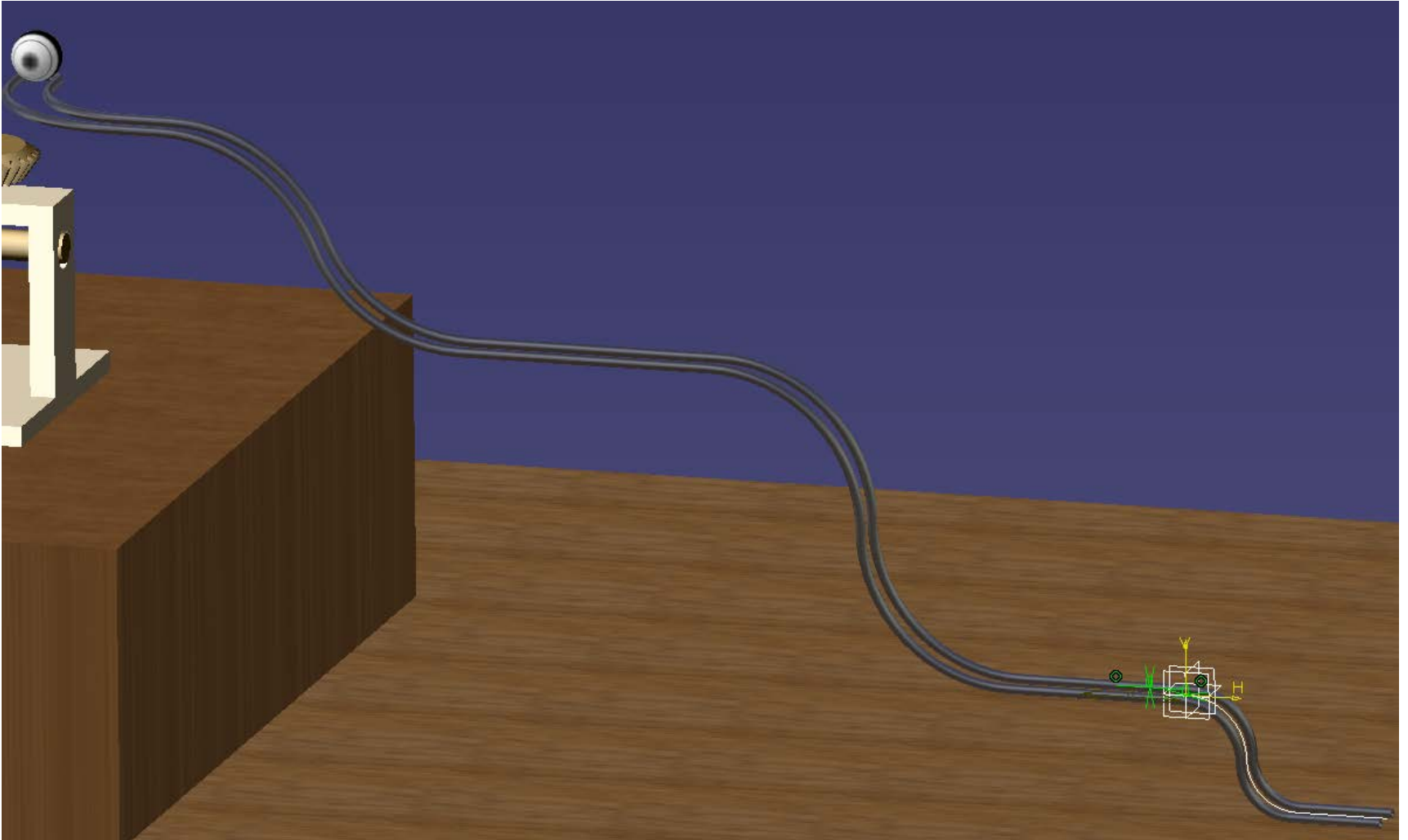


# MODELING & KINEMATICS





# 아쉬웠던 점 & 어려웠던 점



**Q&A**

**감사합니다**