CIVA UT Training

CIVA 2015 Training – UT

INNOBIZ 벤처기업 R&D서비스기업
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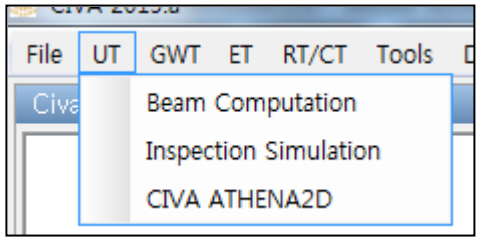
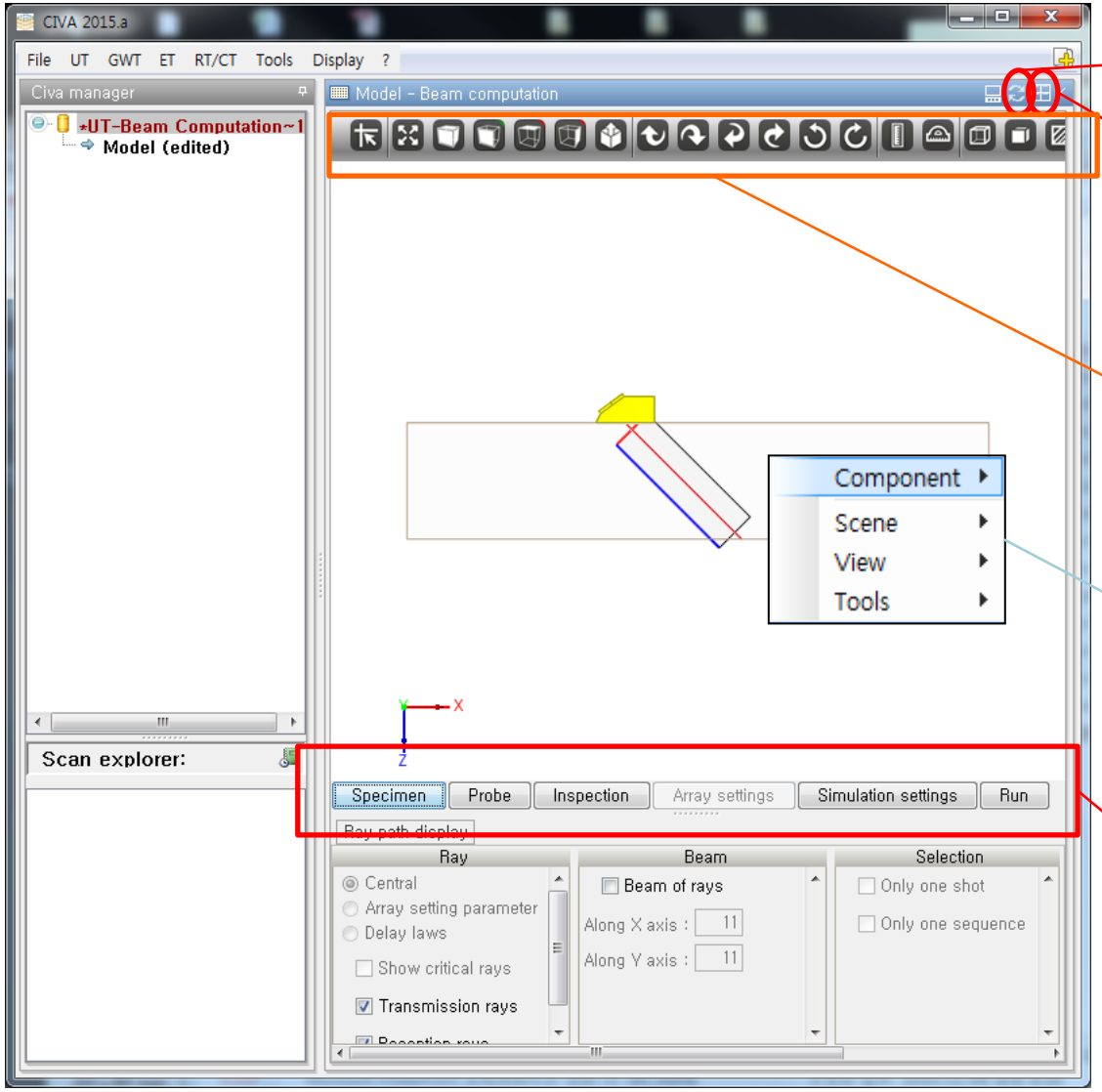
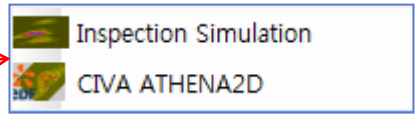
❖UT – main menu

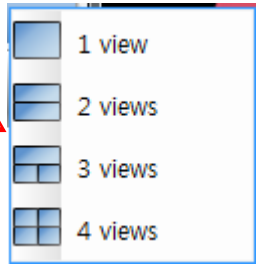
- Beam Computation : 탐촉자를 이용한 시편에서의 초음파 계산
- Inspection Simulation : 결함 또는 시편에 대한 에코계산
- CIVA ATHENA2D : 유한요소 계산을 필요로 하는 복잡한 상호 작용과 시편에서의 에코 계산



❖MENU 및 화면 안내





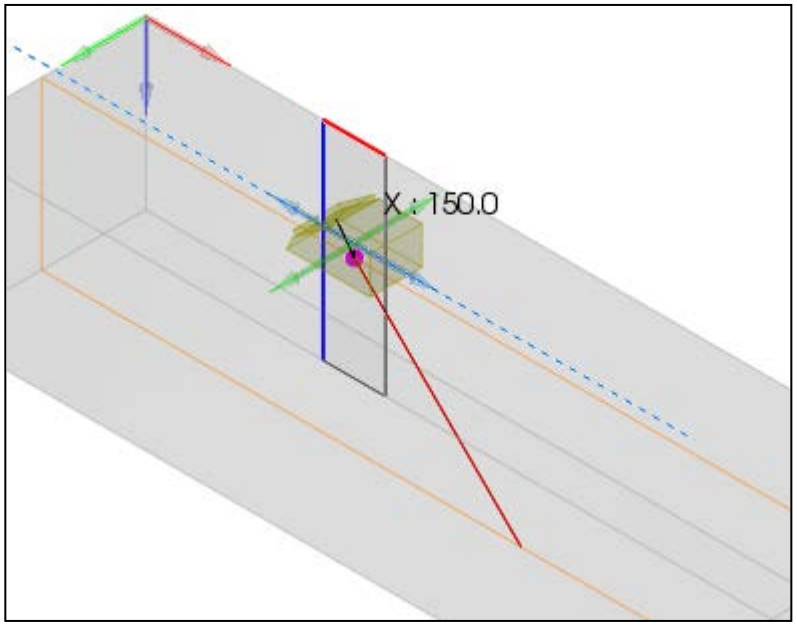


화면 정열, 회전 및 치수 측정

화면 우클릭시 팝업 메뉴
-거리 계산
-화면 이동 및 정열
등

작업 메뉴

❖마우스 이용 방법



-화면에서의 마우스는

1. 좌 클릭 : 화면 이동
2. 우 클릭 : 화면 확대(아래), 축소(위)
3. 휠 버튼 클릭 : 회전

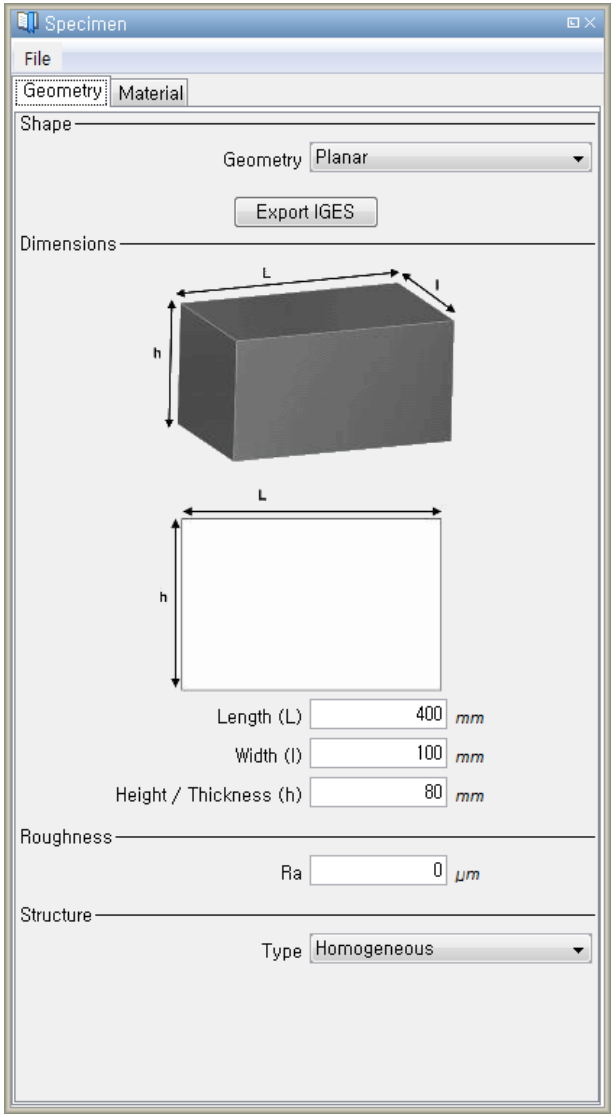
-Probe 및 Specimen 선택

Probe 및 Specimen을 마우스 좌버튼 더블 클릭시 활성화 되며 동시에 x,y,z 축의 화살표가 생성이 됩니다.

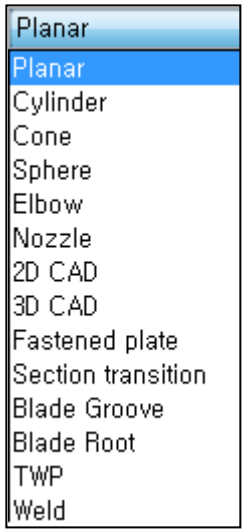
생성된 화살표를 이용하여 각 축을 따라 이동 시킬 수 있습니다.

이러한 방법으로 화면에 표현되는 형태의 위치를 변경할 수 있습니다.

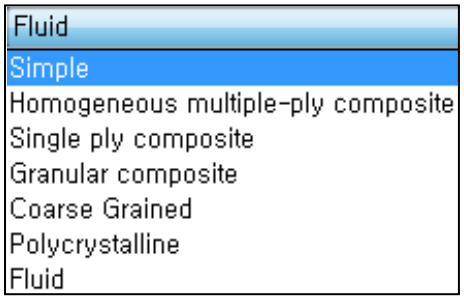
❖Specimen 설정

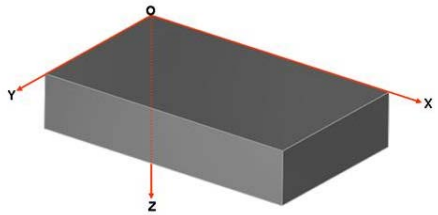


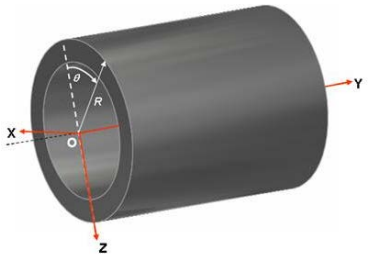
보유 형상 :

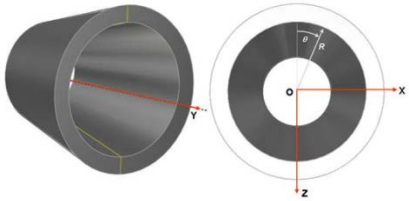


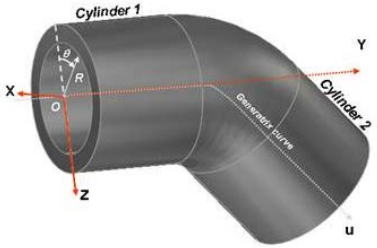
보유 물성 :

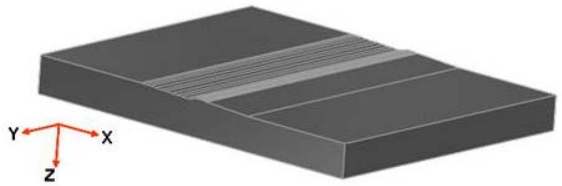




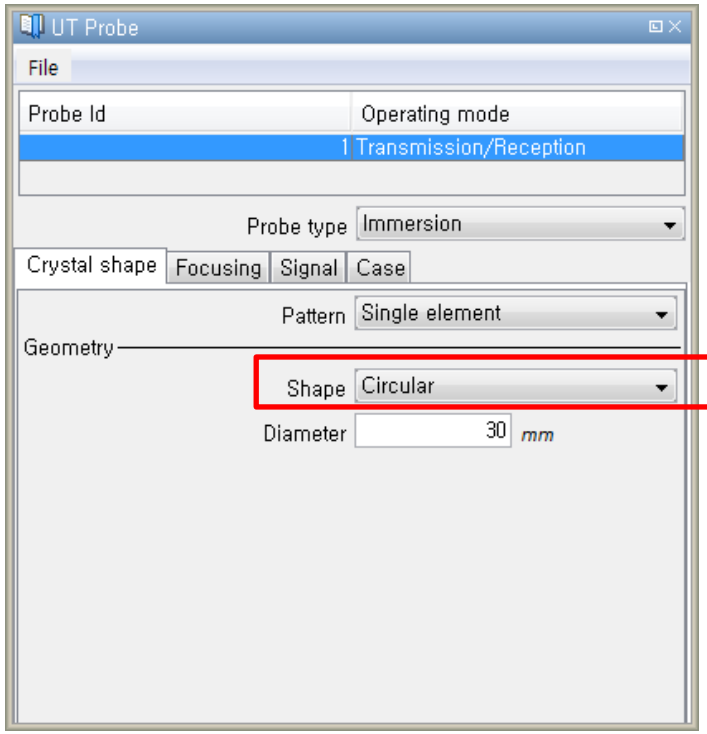


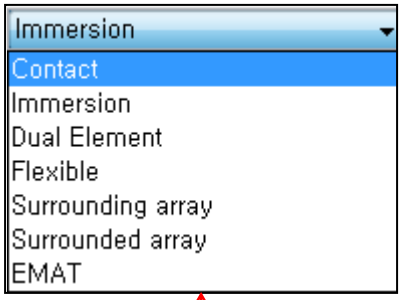


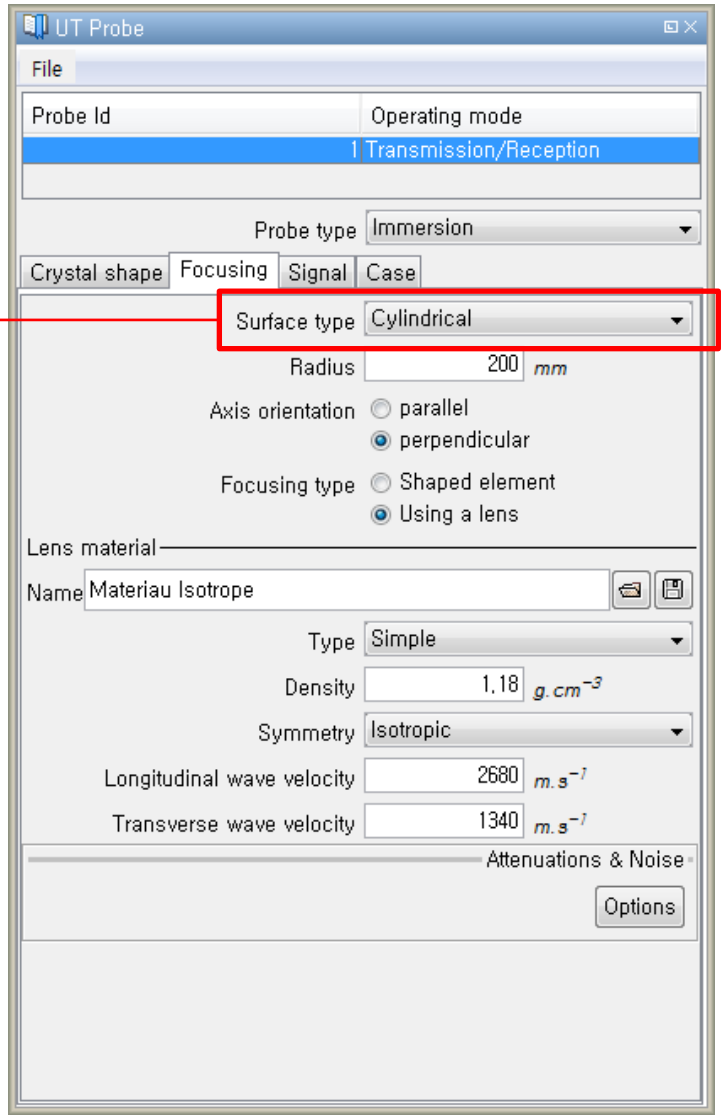




❖Probe

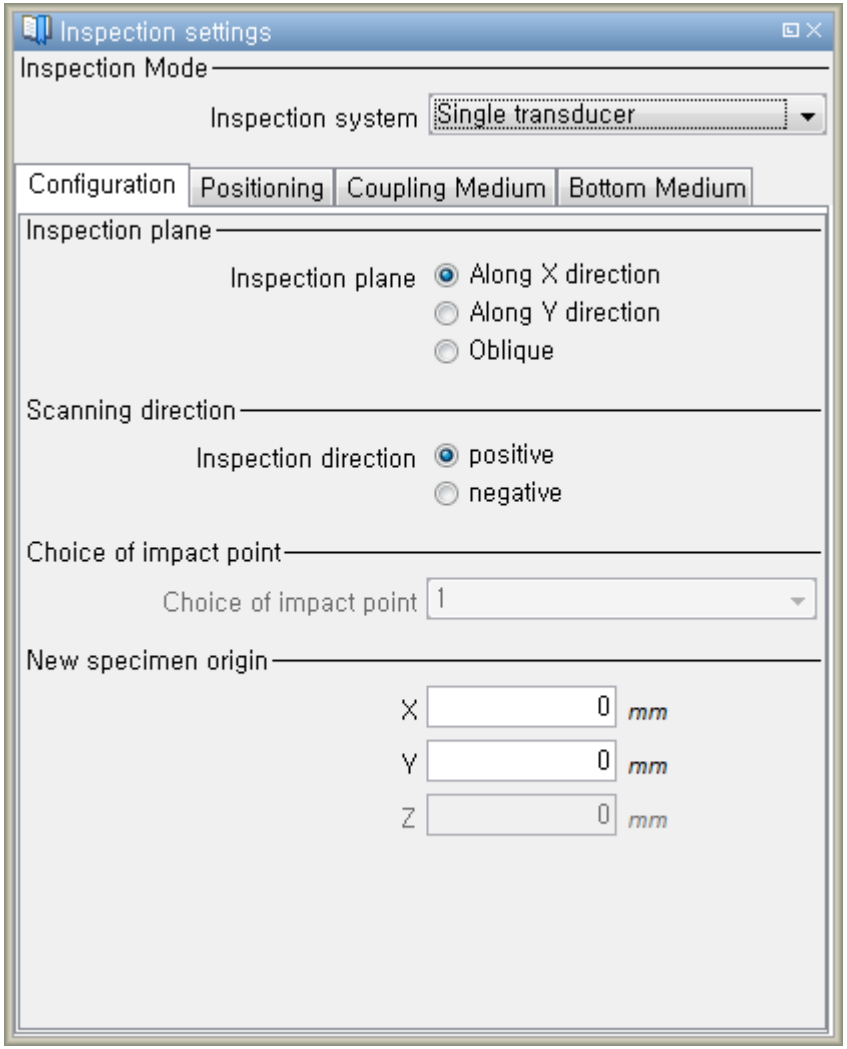


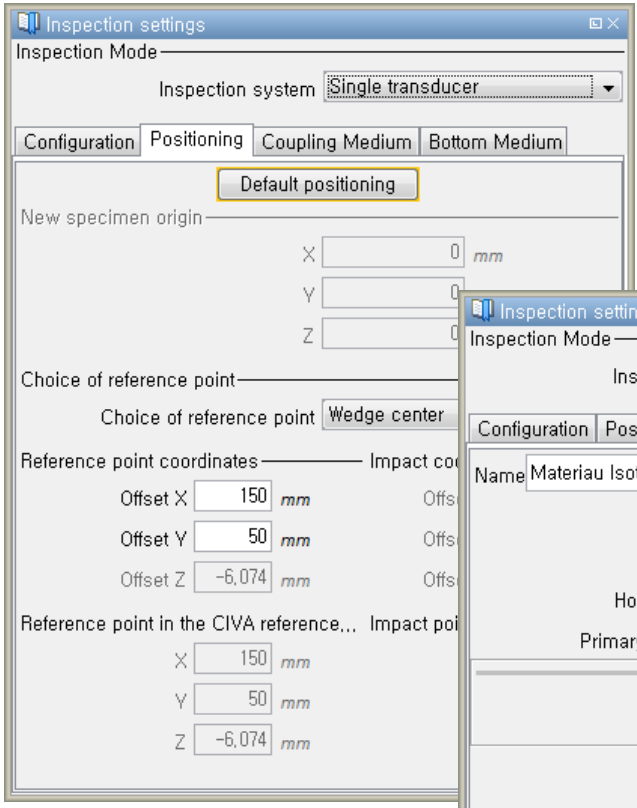


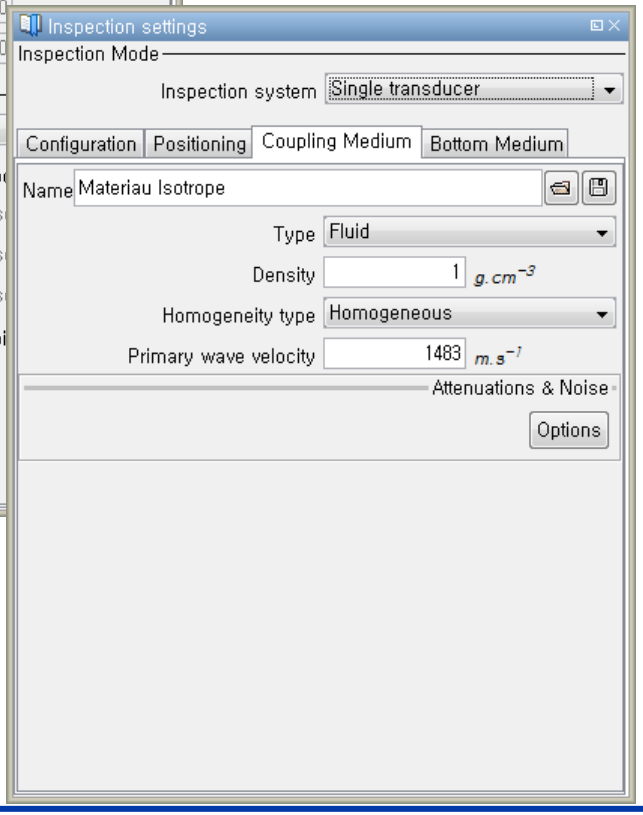


Circular Elliptical Rectangular

❖Inspection settings





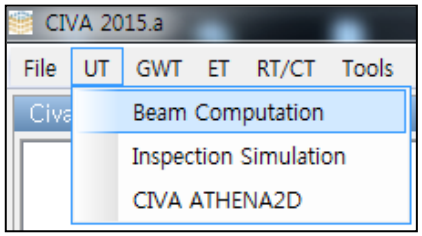


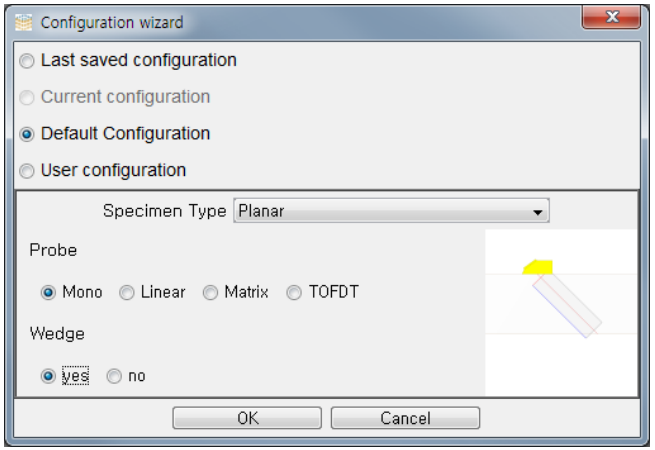
❖Example 1 – Immersion Testing

- 1. L0 inspection with a non-focused transducer
- 2. L0 inspection with a spherically focused transducer
- 3. L60 inspection

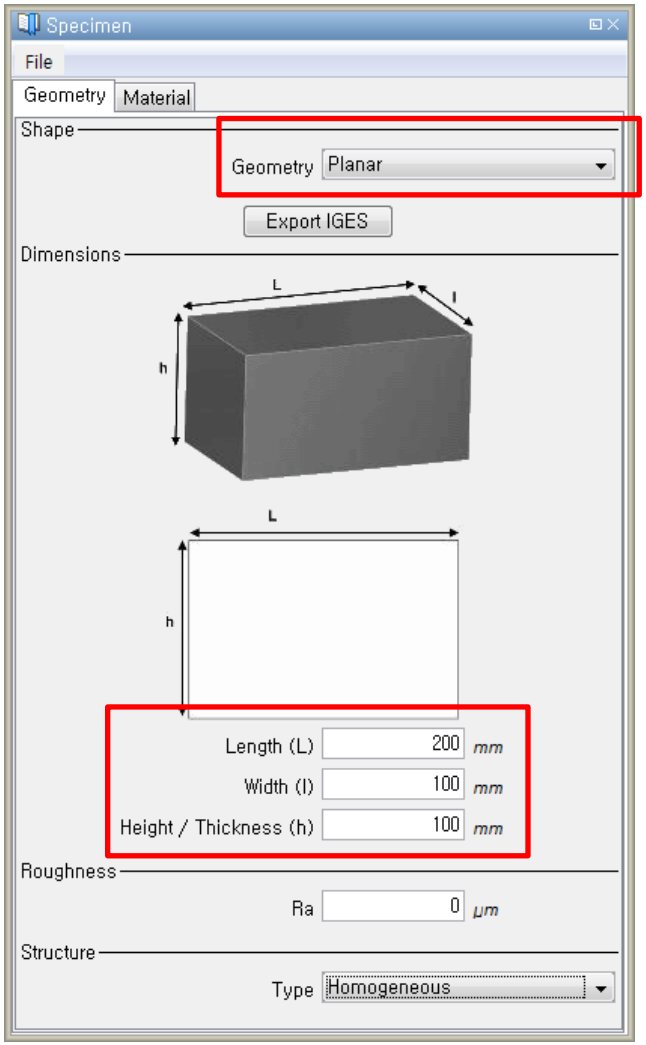
❖UT 시작 및 Specimen 생성

- Beam computation 모듈 활성화



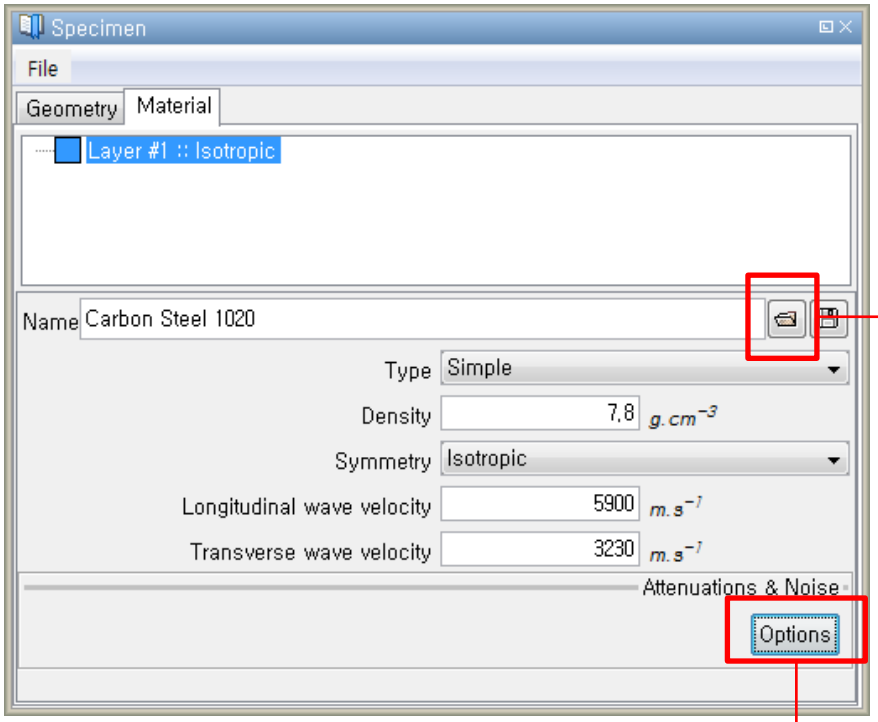


- 시편 - 형상 선정 및 치수 입력

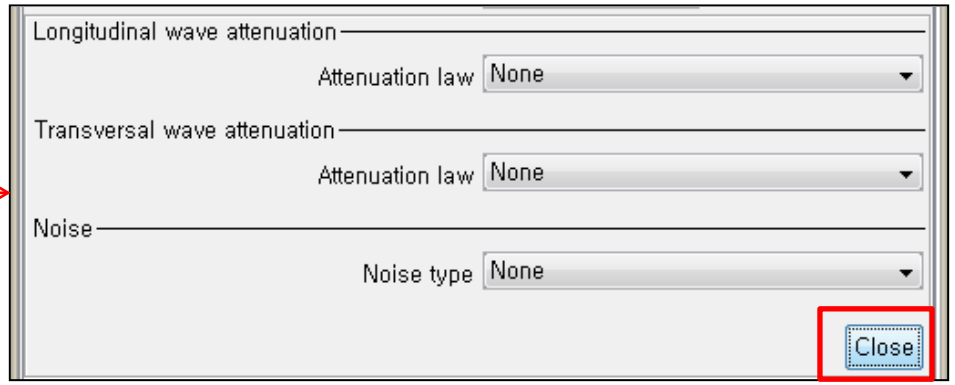


❖Specimen 물성 설정

- 시편 – 물성 입력

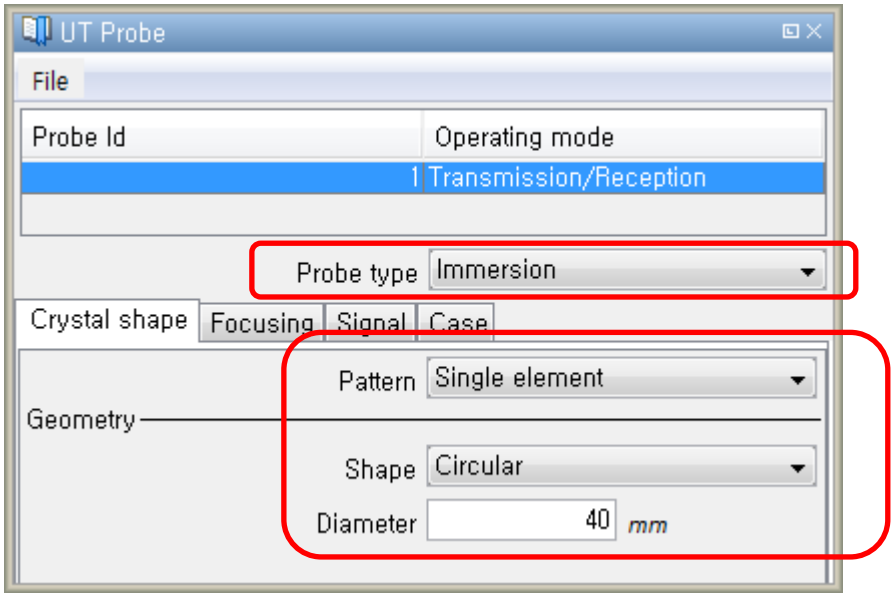


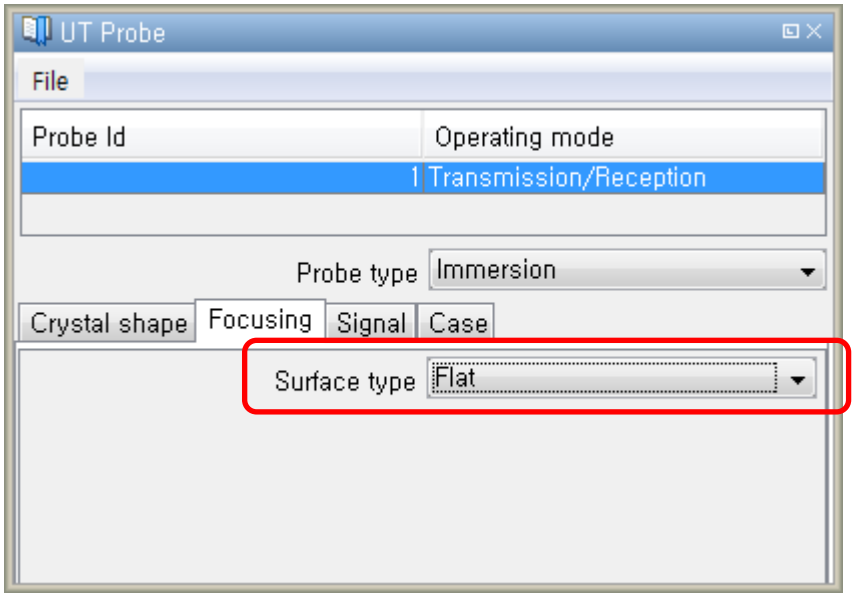
Material DB에 들어가는 버튼입니다.
클릭하여 Isotropic 폴더에 Steel을 선택합니다.



❖Probe 수정(1/2)

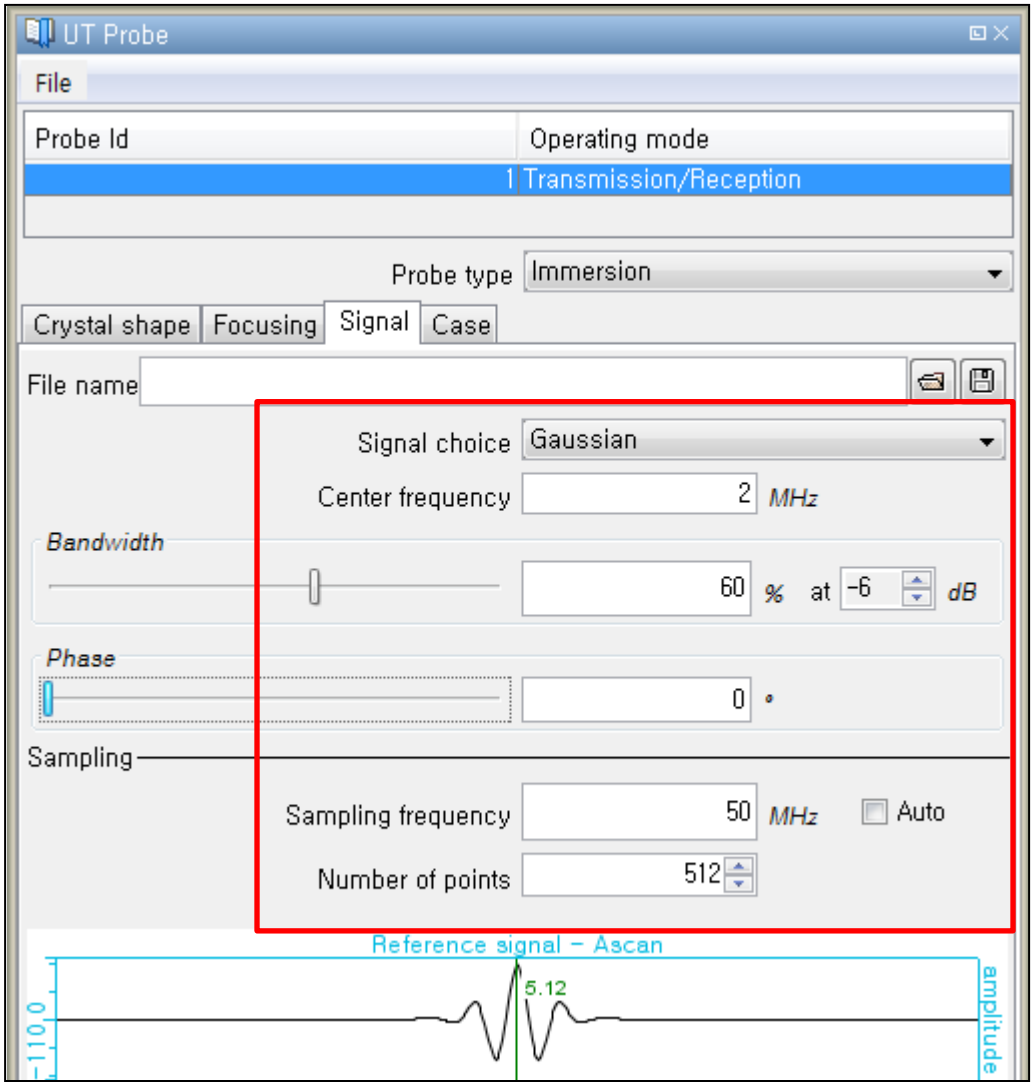
- Probe 수정

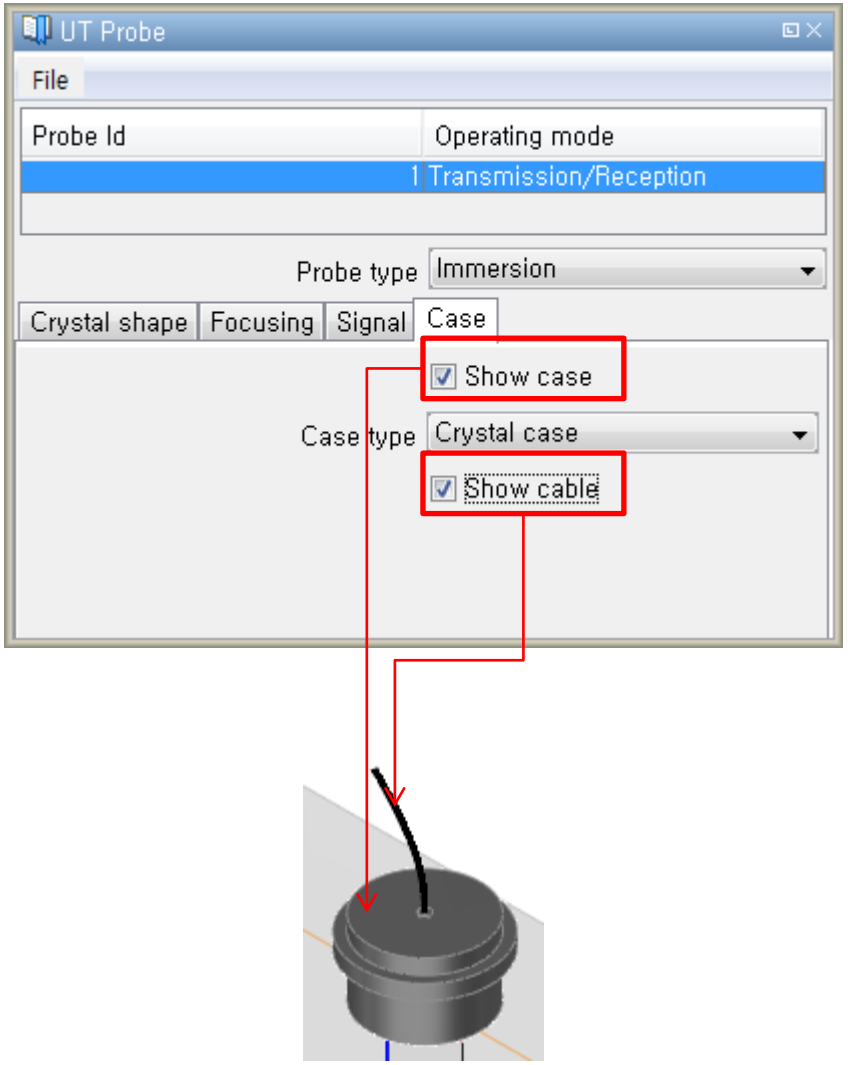




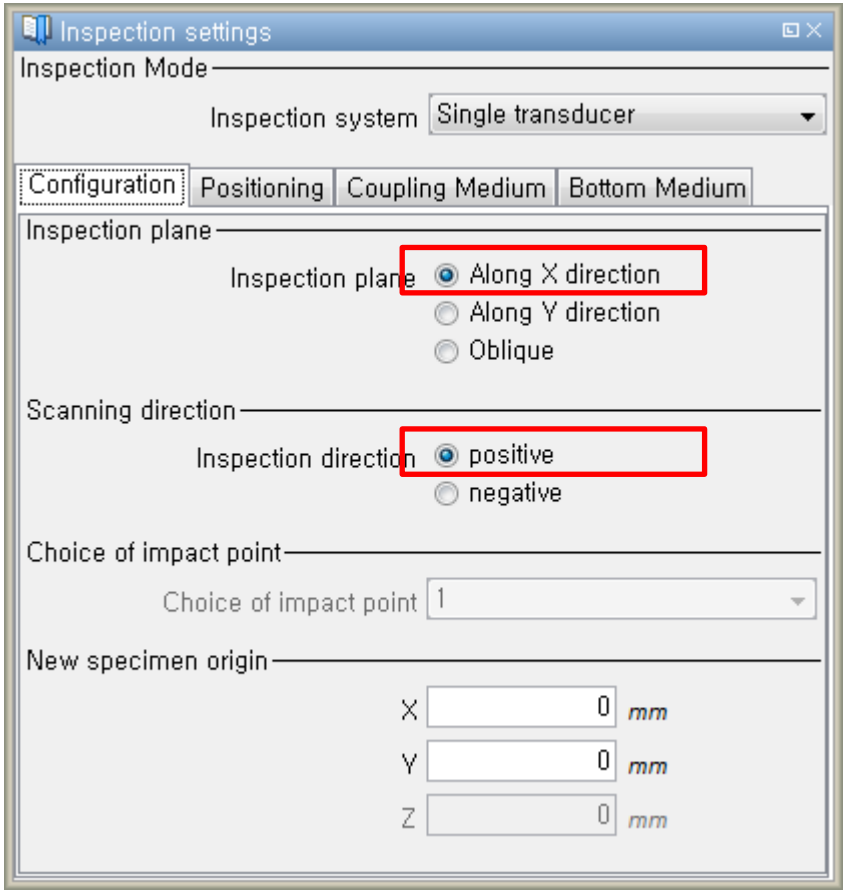
Focusing – Flat은 Non-focused probe를 의미합니다.

❖Probe 수정(2/2)

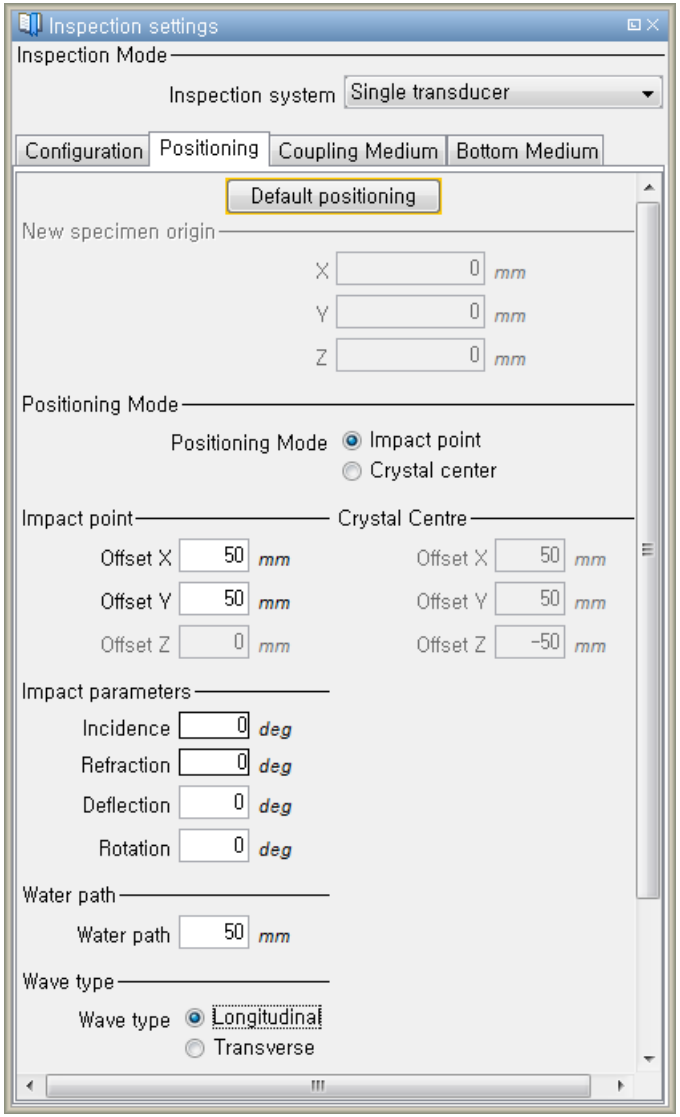

UT Probe
File
Probe Id
Operating mode
1 Transmission/Reception
Probe type
Immersion
Crystal shape
Focusing
Signal
Case
File name
Signal choice
Gaussian
Center frequency
2
MHz
Bandwidth
60
%
at
-6
dB
Phase
0
°
Sampling
Sampling frequency
50
MHz
Auto
Number of points
512
Reference signal – Ascan
5.12
-110
0
amplitude

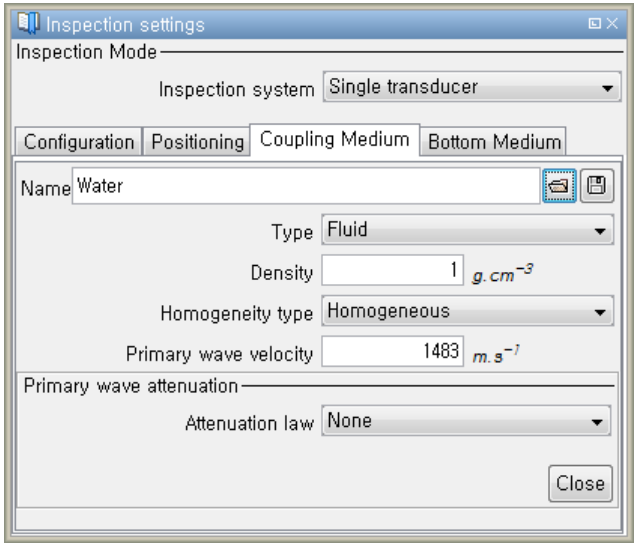

UT Probe
File
Probe Id
Operating mode
1 Transmission/Reception
Probe type
Immersion
Crystal shape
Focusing
Signal
Case
Show case
Case type
Crystal case
Show cable

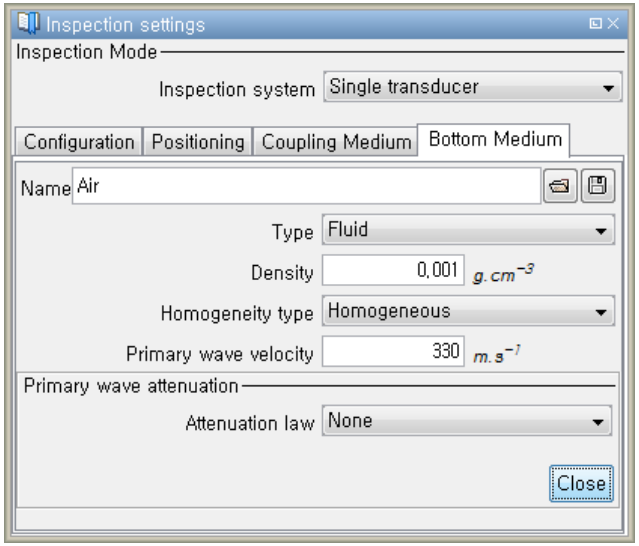
❖Inspection 설정(1/2)

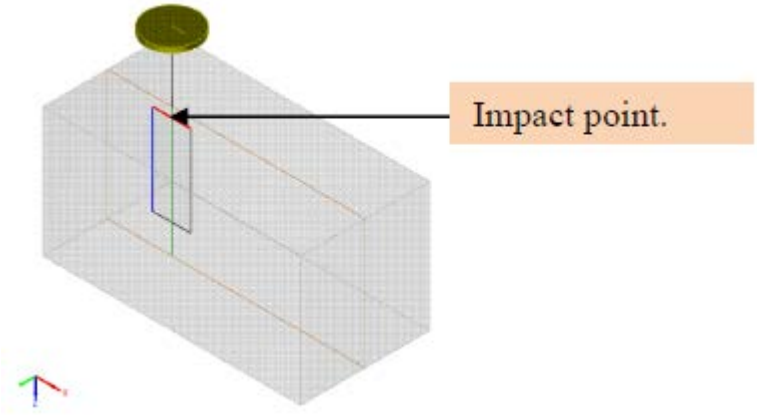


❖Inspection 설정(2/2)

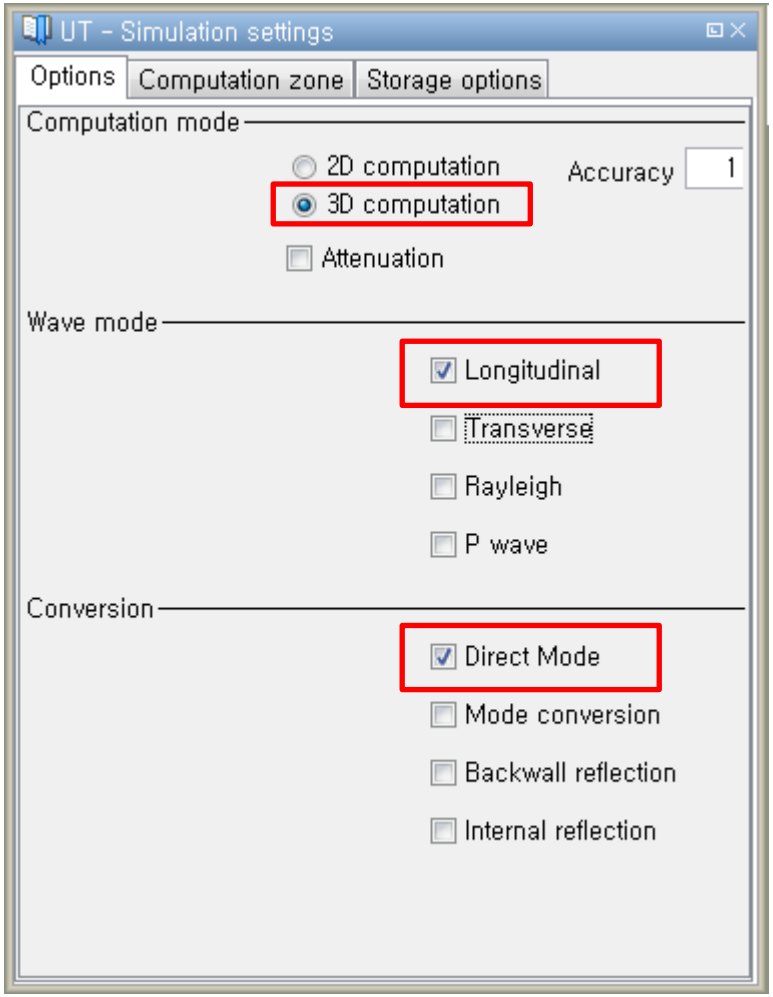


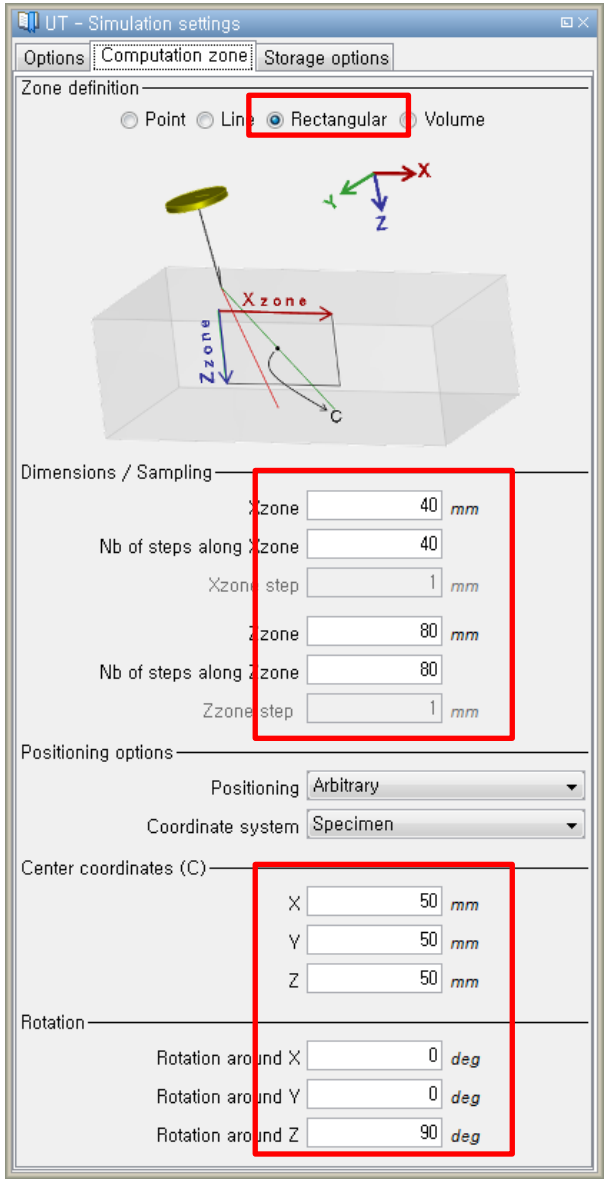


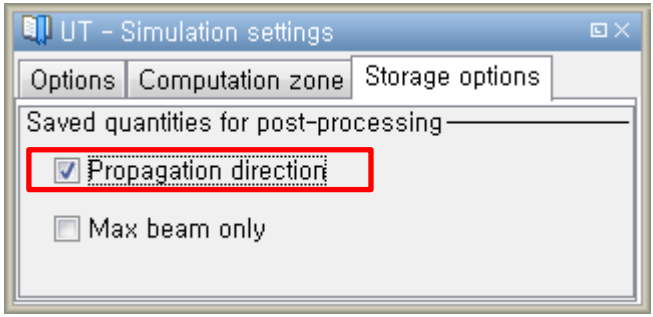


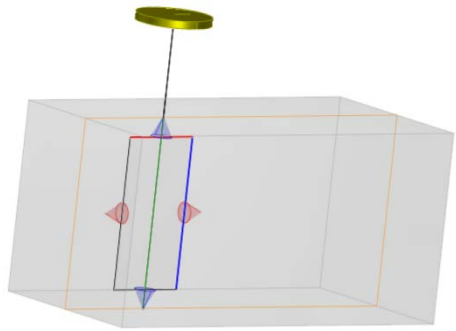


❖Simulation setting

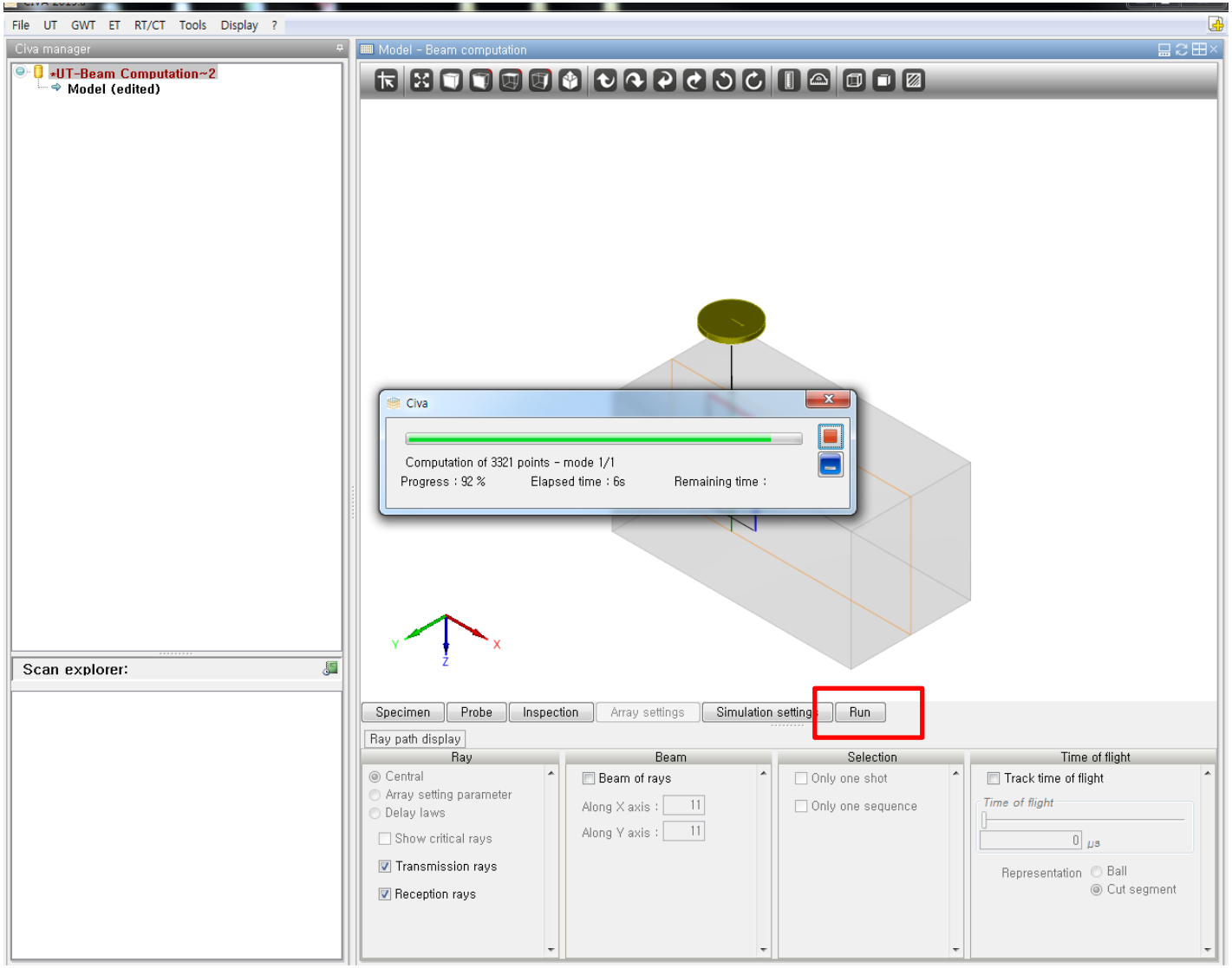




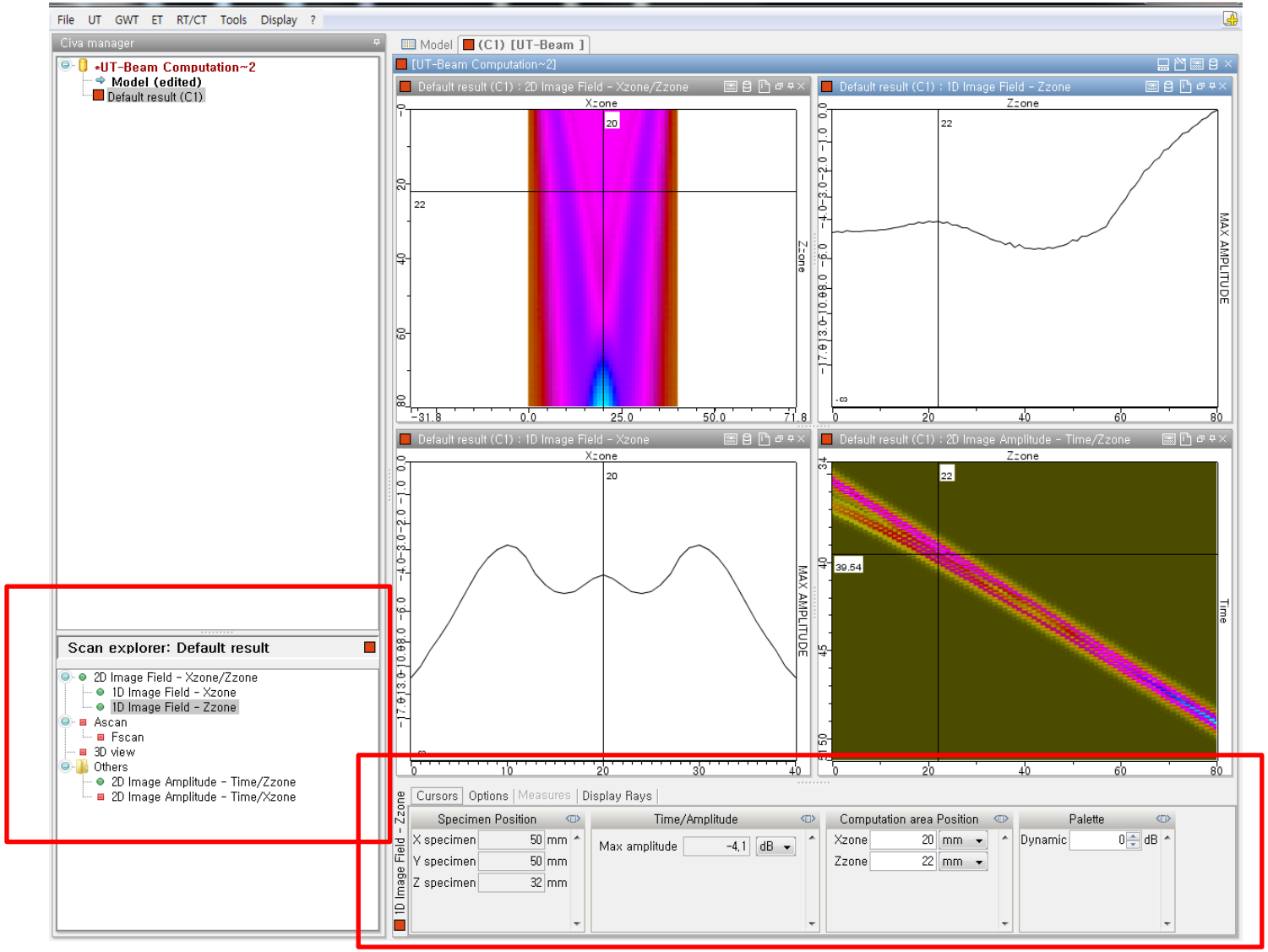




❖Solving 진행(Run)



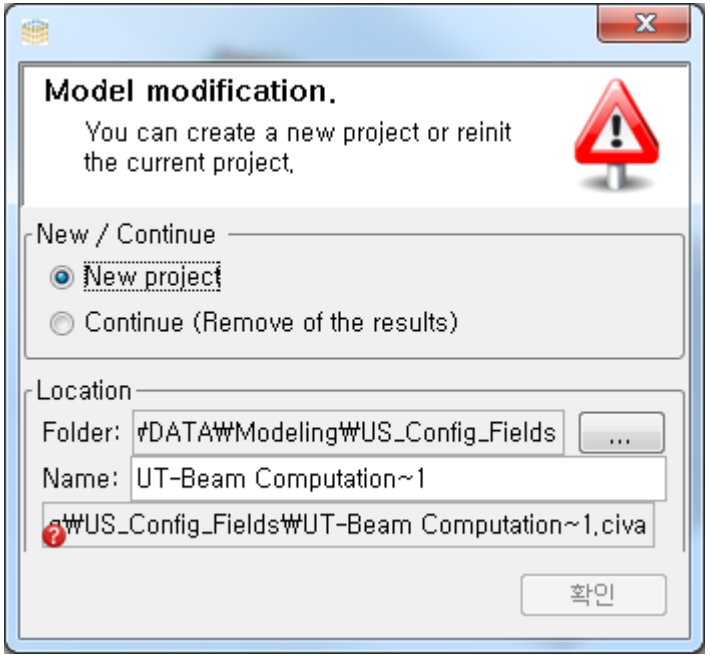
❖Post-processing



❖Example – Immersion Testing

- 1. L0 inspection with a non-focused transducer
- 2. L0 inspection with a spherically focused transducer
- 3. L60 inspection

❖입력 조건 및 기타 내용 변경

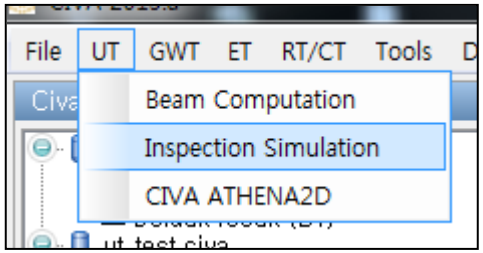


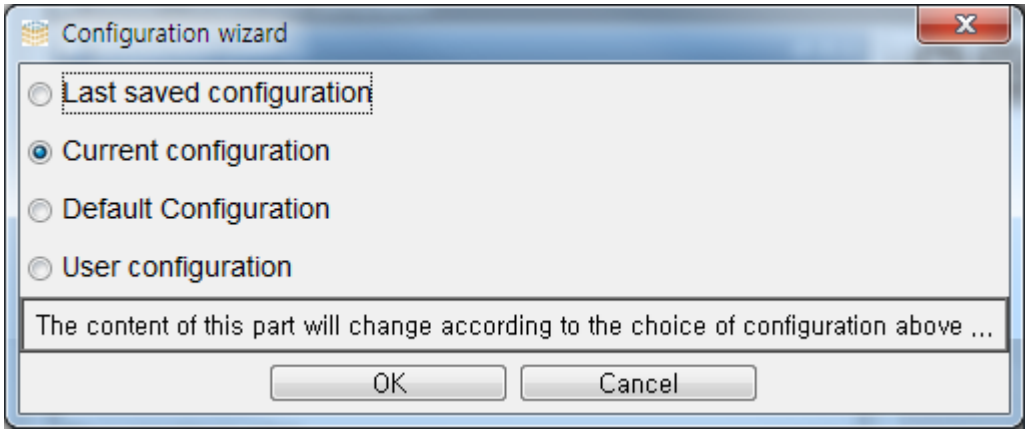
해석이 완료된 상태에서 입력 조건 등을 변경하에 되면 왼쪽과 같은 창이 나오면서, 파일 저장을 물어봅니다.

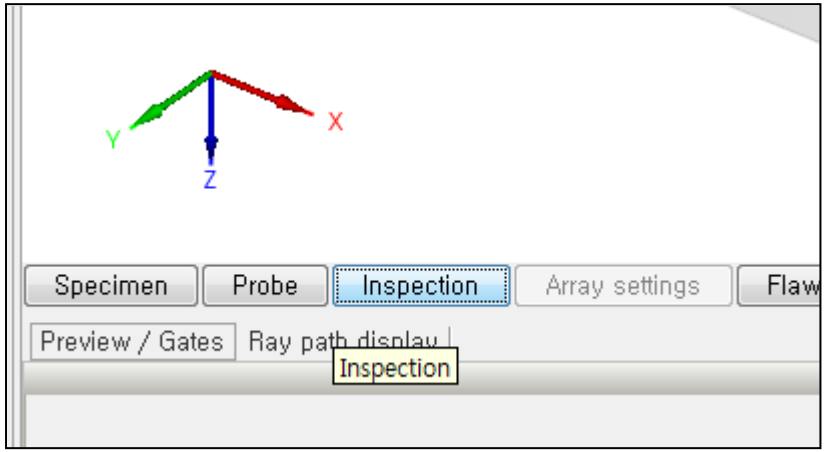
1.새로운 이름으로 저장
2.해석 결과 삭제 후 변경된 조건으로 해석

위의 두 가지 선택사항이 제공됩니다.

❖Inspection simulation으로 변경 및 Flaw 생성

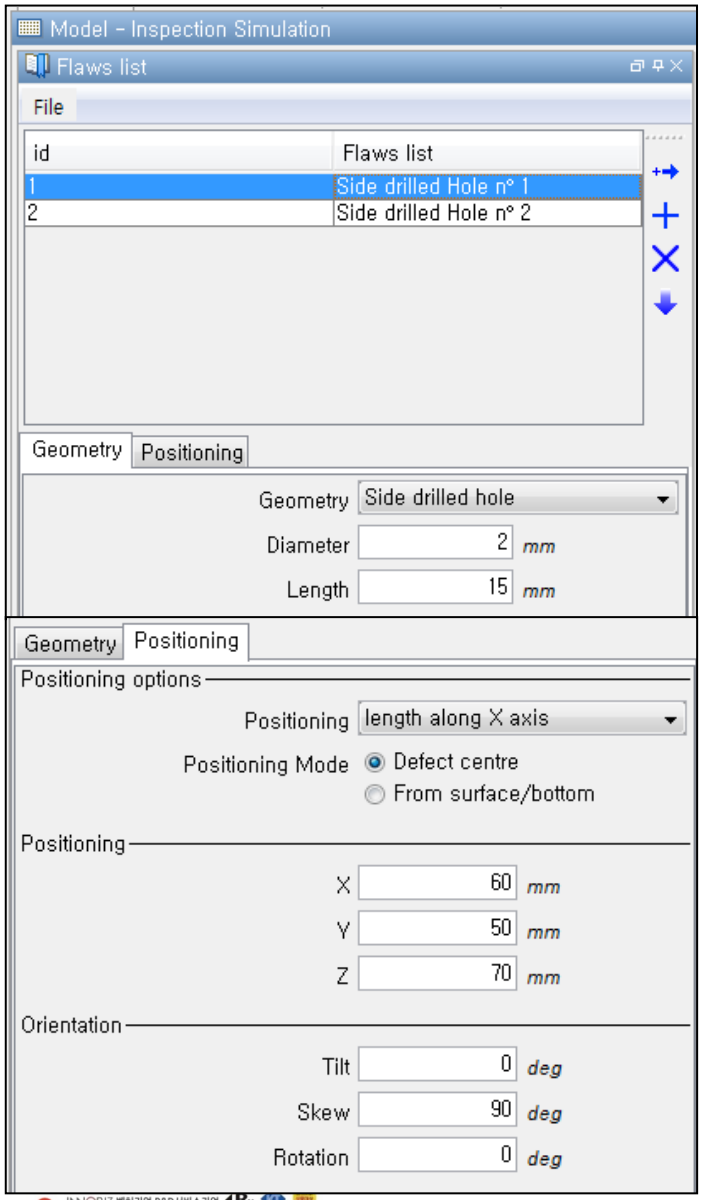


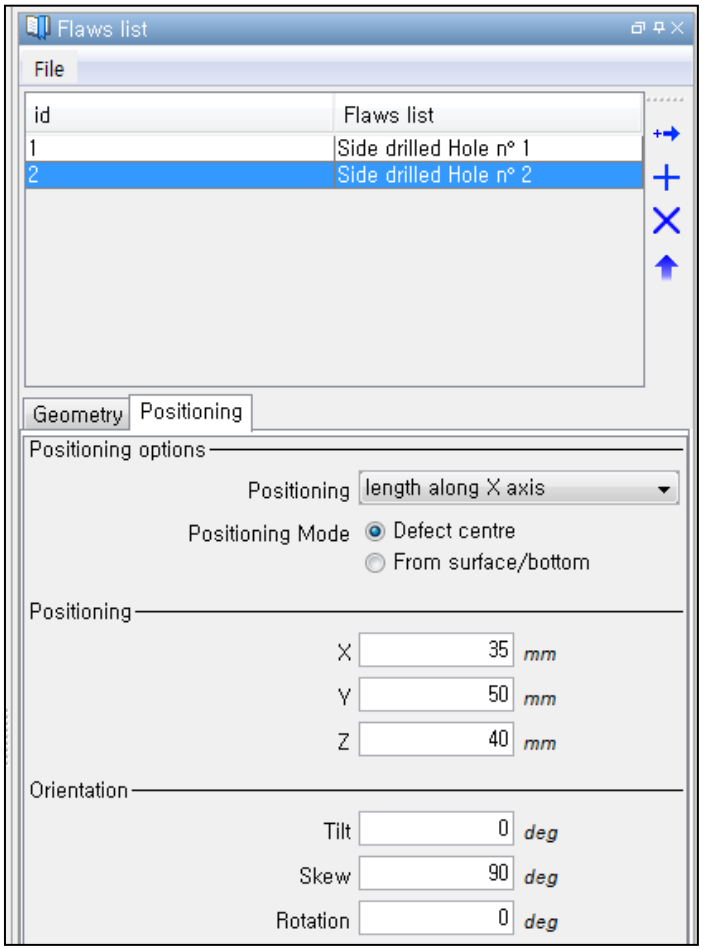


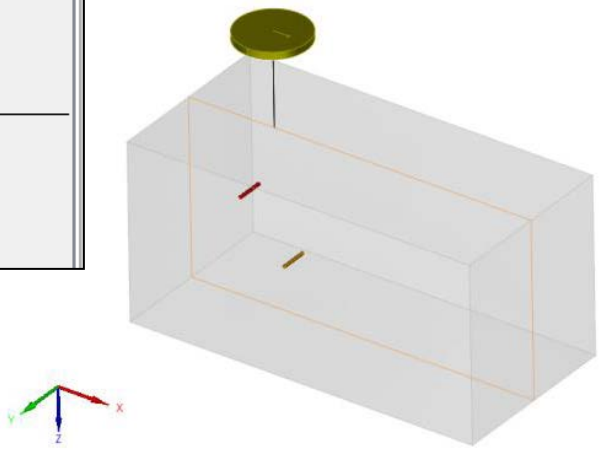


계산이 완료된 후 UT – Inspection Simulation을 선택하면 Configuration wizard가 활성화 된다.

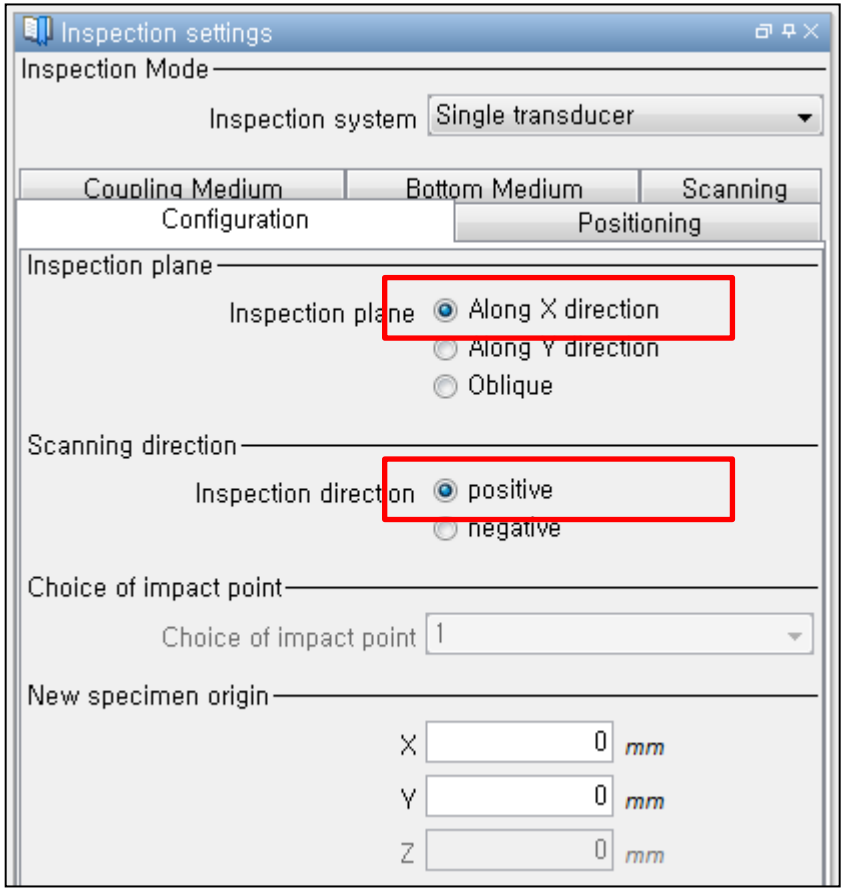
❖Flaw 생성

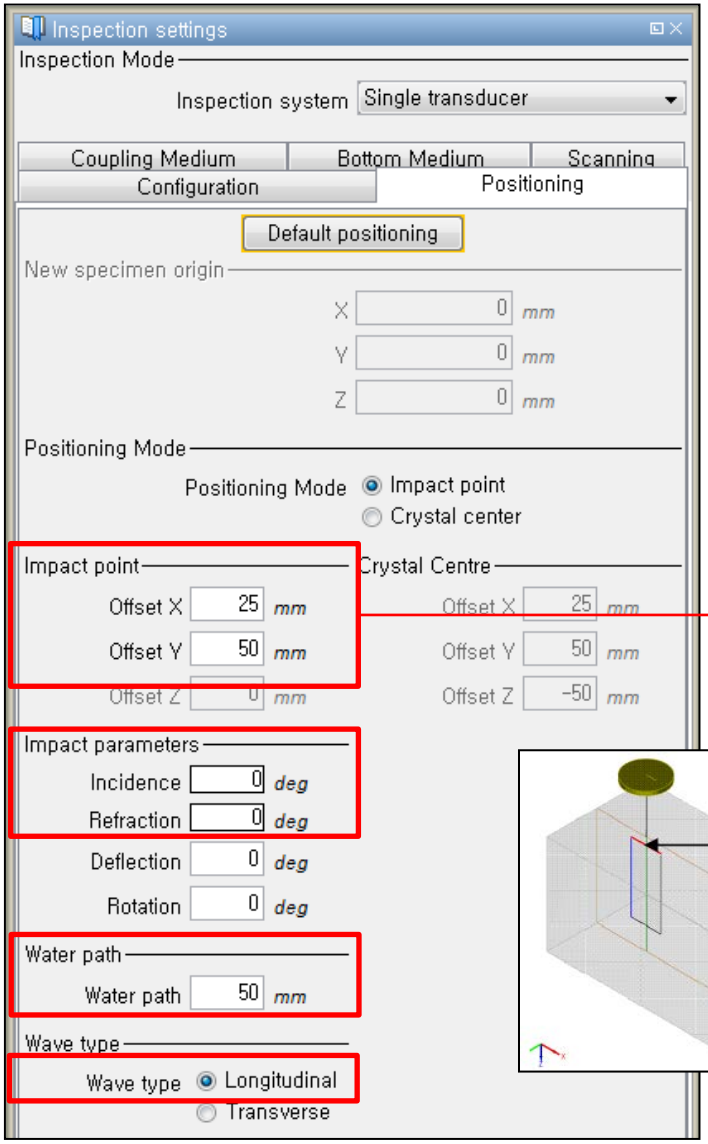

Model - Inspection Simulation
Flaws list
File
id
Flaws list
1
Side drilled Hole n° 1
2
Side drilled Hole n° 2
Geometry
Positioning
Geometry
Side drilled hole
Diameter
2
mm
Length
15
mm
Geometry
Positioning
Positioning options
Positioning
length along X axis
Positioning Mode
Defect centre
From surface/bottom
Positioning
X
60
mm
Y
50
mm
Z
70
mm
Orientation
Tilt
0
deg
Skew
90
deg
Rotation
0
deg

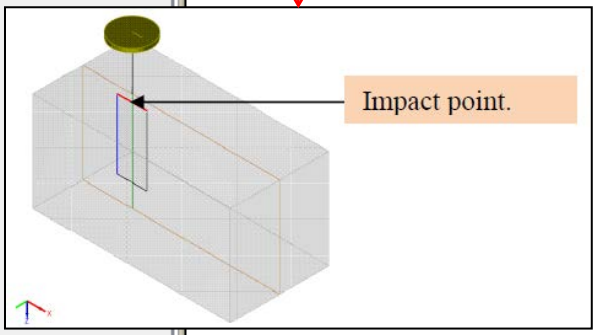

Flaws list
File
id
Flaws list
1
Side drilled Hole n° 1
2
Side drilled Hole n° 2
Geometry
Positioning
Positioning options
Positioning
length along X axis
Positioning Mode
Defect centre
From surface/bottom
Positioning
X
35
mm
Y
50
mm
Z
40
mm
Orientation
Tilt
0
deg
Skew
90
deg
Rotation
0
deg



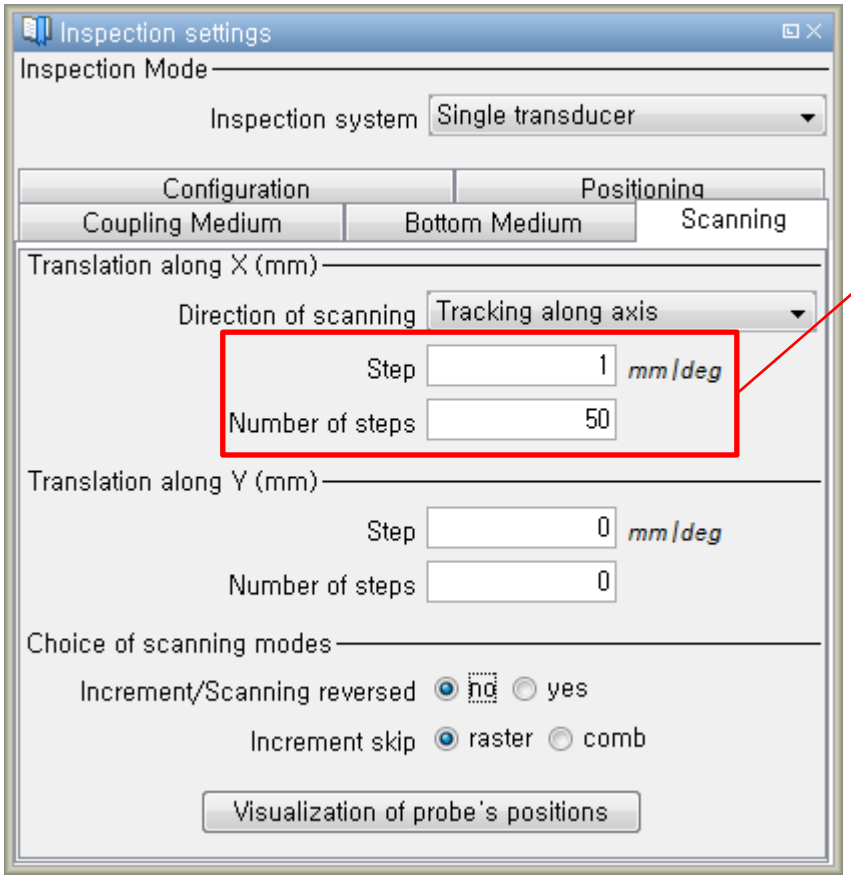
❖Inspection 설정(1/2)





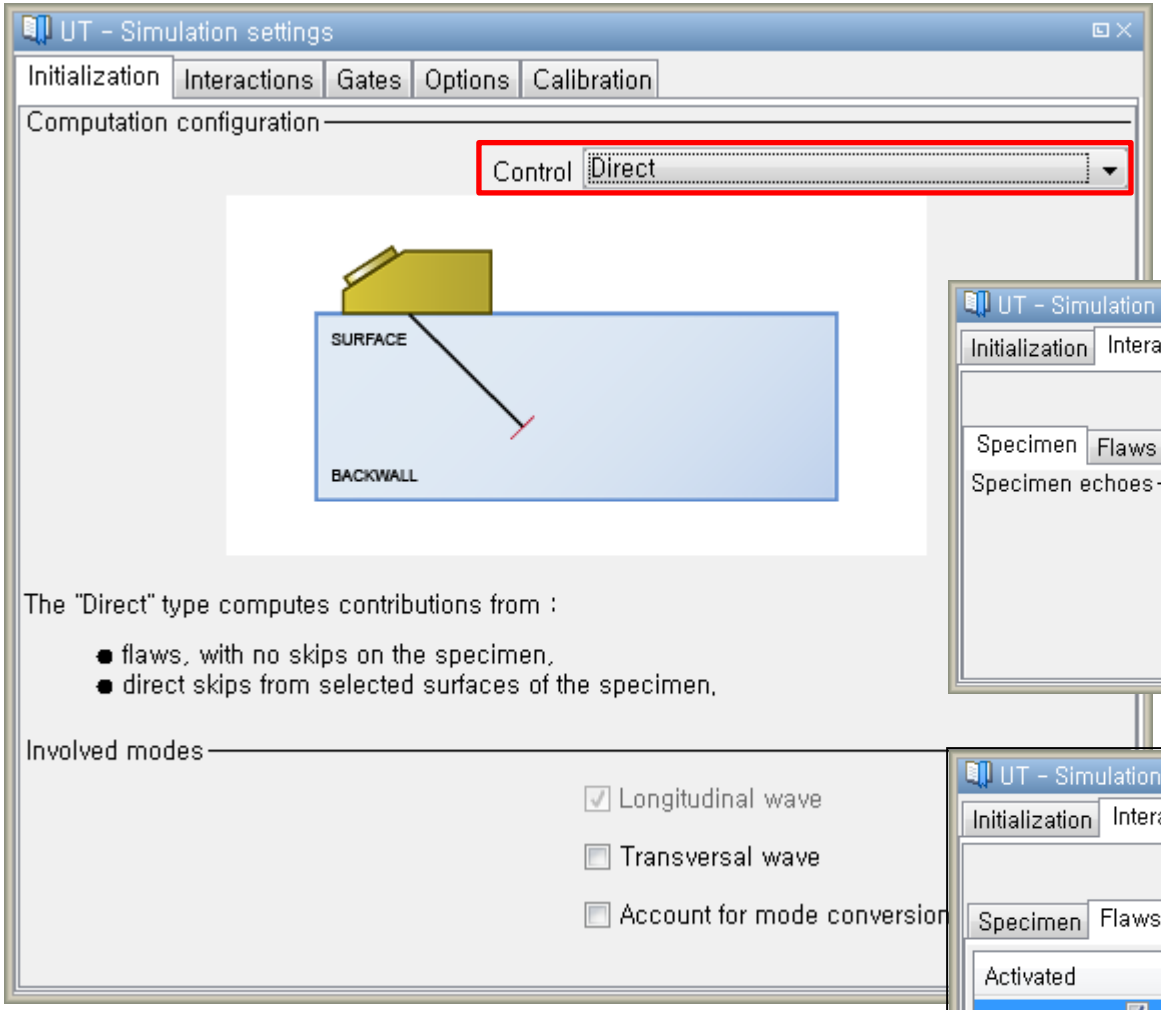


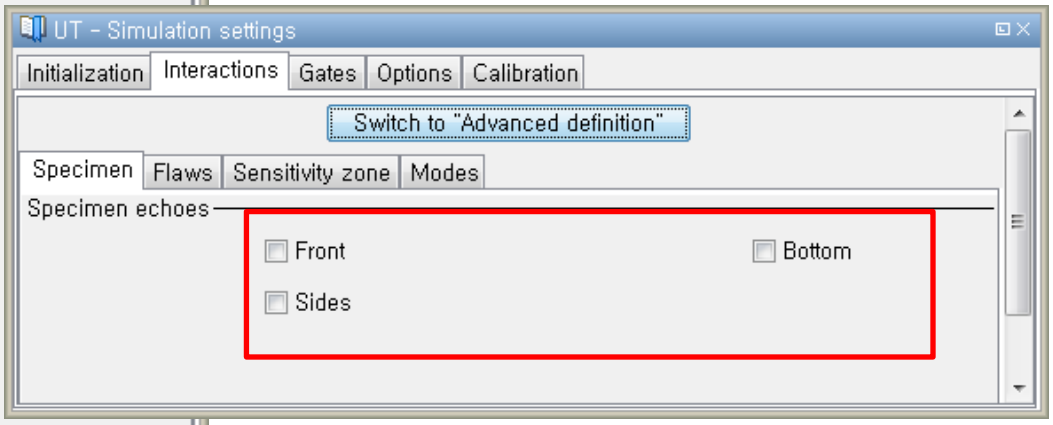
❖Inspection 설정(2/2)

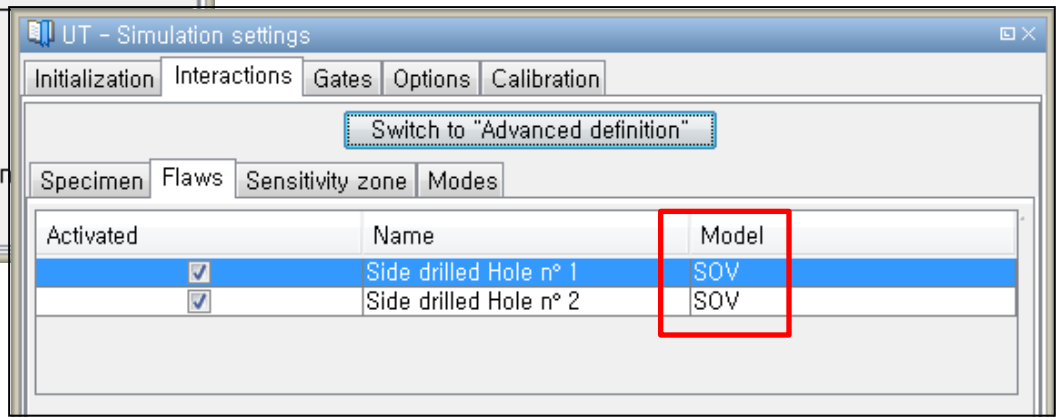


1mm/deg의 step value로 50회 진행

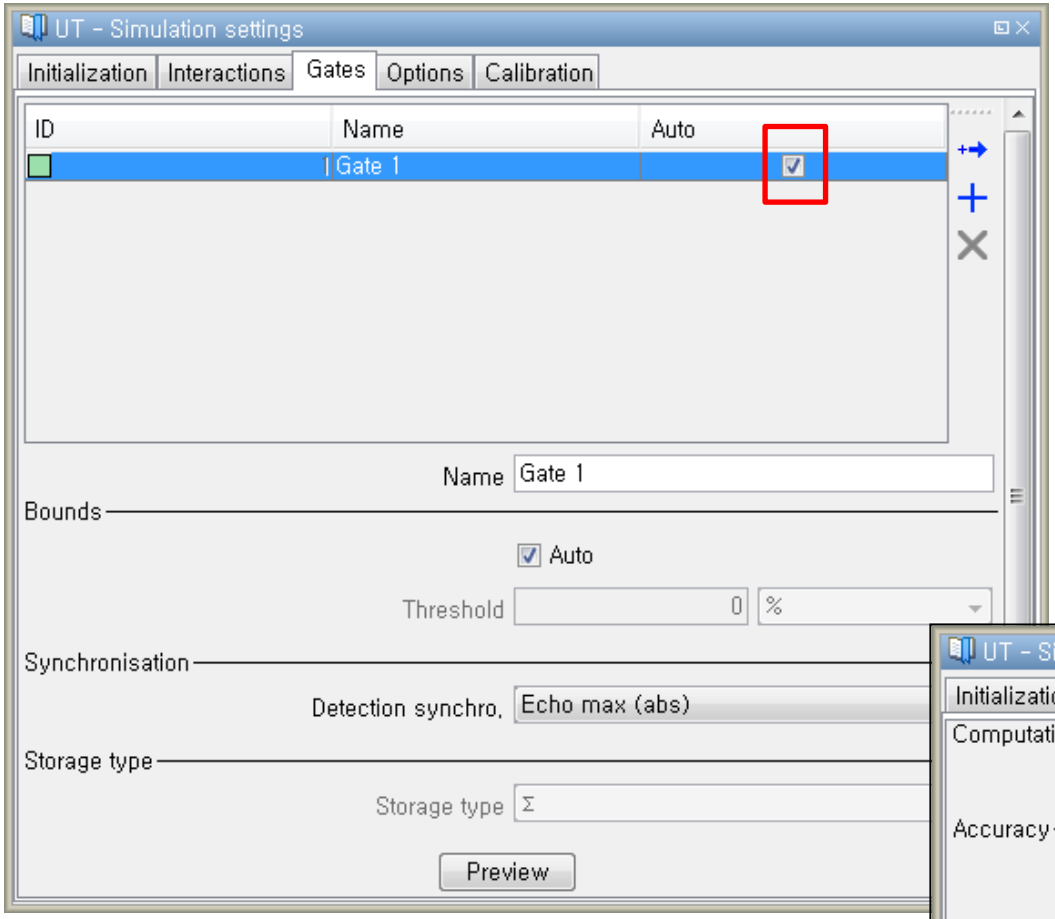
❖Simulation setting 변경

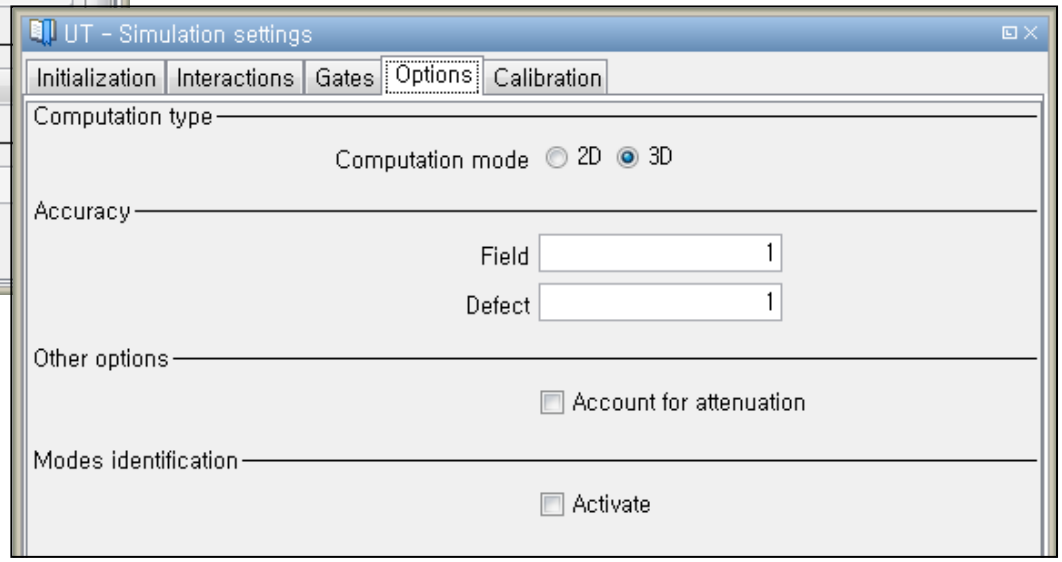




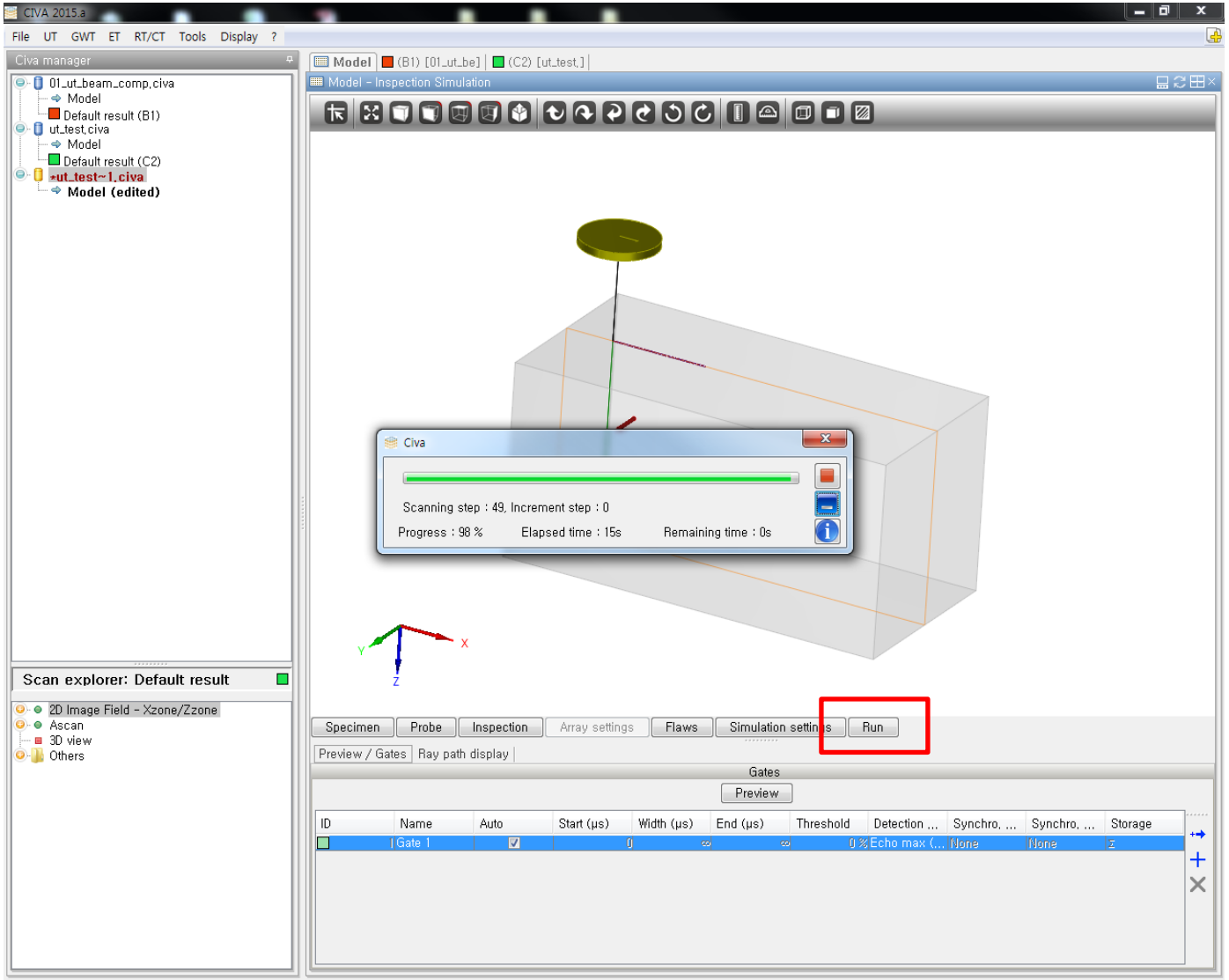


❖Simulation settings

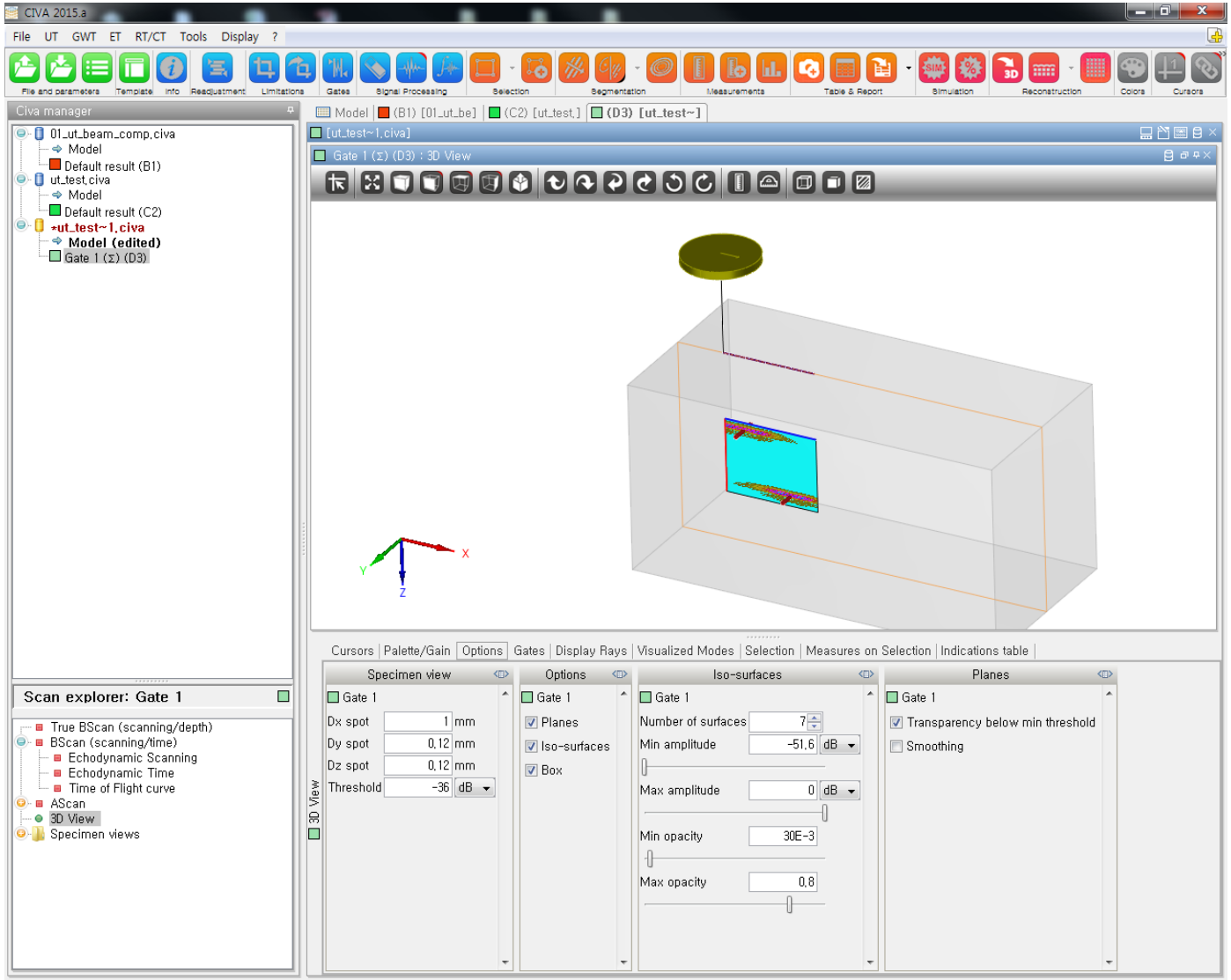




❖해석 진행(Run)

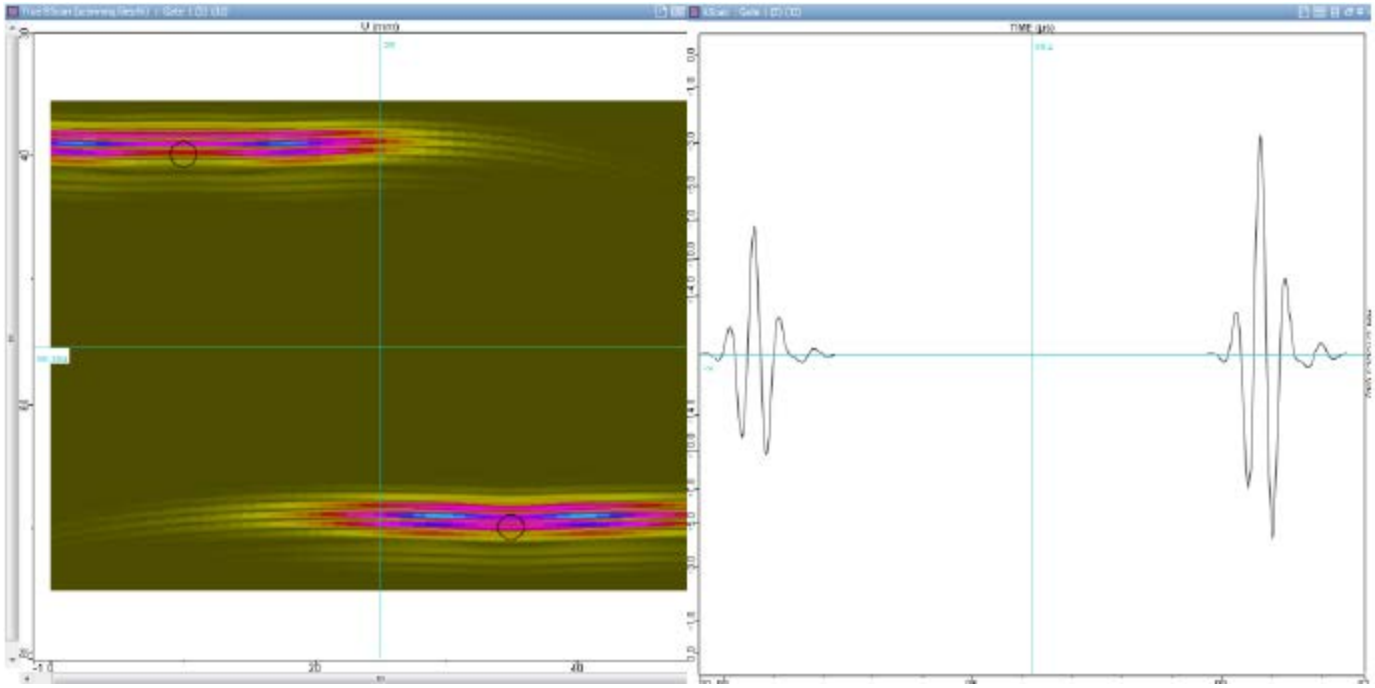

CIVA 2015.a
File UT GWT ET RT/CT Tools Display ?
Civa manager
01_ut_beam_comp.civa
Model
Default result (B1)
ut_test.civa
Model
Default result (C2)
*ut_test~1.civa
Model (edited)
Model
(B1) [01_ut_be]
(C2) [ut_test.]
Model - Inspection Simulation
Civa
Scanning step : 49, Increment step : 0
Progress : 98 %
Elapsed time : 15s
Remaining time : 0s
Scan explorer: Default result
2D Image Field - Xzone/Zzone
Ascan
3D view
Others
Specimen
Probe
Inspection
Array settings
Flaws
Simulation settings
Run
Preview / Gates
Ray path display
Gates
Preview
ID
Name
Auto
Start (µs)
Width (µs)
End (µs)
Threshold
Detection ...
Synchro, ...
Synchro, ...
Storage
Gate 1
0
∞
∞
0 %
Echo max (...
None
None

❖결과 확인(1/2)

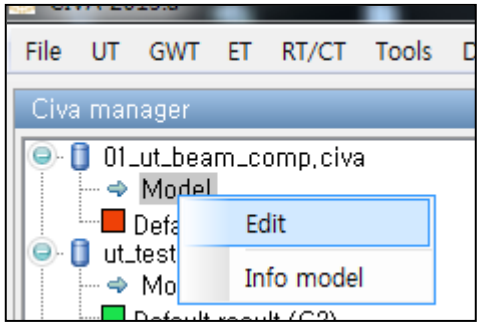

CIVA 2015.a
File UT GWT ET RT/CT Tools Display ?
Civa manager
01_ut_beam_comp.civa
Model
Default result (B1)
ut_test.civa
Model
Default result (C2)
*ut_test~1.civa
Model (edited)
Gate 1 (Σ) (D3)
Scan explorer: Gate 1
True BScan (scanning/depth)
BScan (scanning/time)
Echodynamic Scanning
Echodynamic Time
Time of Flight curve
AScan
3D View
Specimen views
Model (B1) [01_ut_be] (C2) [ut_test_] (D3) [ut_test~]
[ut_test~1.civa]
Gate 1 (Σ) (D3) : 3D View
Cursors Palette/Gain Options Gates Display Rays Visualized Modes Selection Measures on Selection Indications table
Specimen view
Gate 1
Dx spot 1 mm
Dy spot 0,12 mm
Dz spot 0,12 mm
Threshold -36 dB
Options
Gate 1
Planes
Iso-surfaces
Box
Iso-surfaces
Gate 1
Number of surfaces 7
Min amplitude -51,6 dB
Max amplitude 0 dB
Min opacity 30E-3
Max opacity 0,8
Planes
Gate 1
Transparency below min threshold
Smoothing
3D View

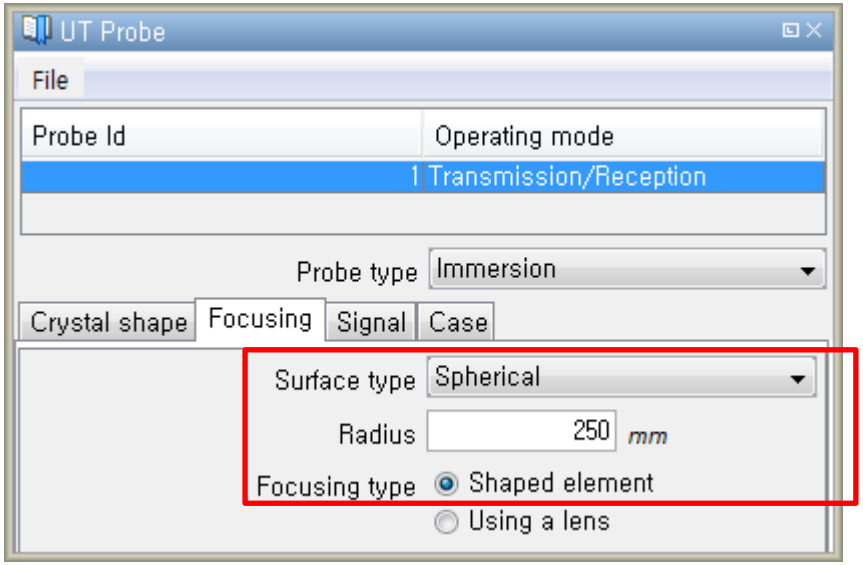
❖결과 확인(2/2)

- B-scan, A-Scan 형상

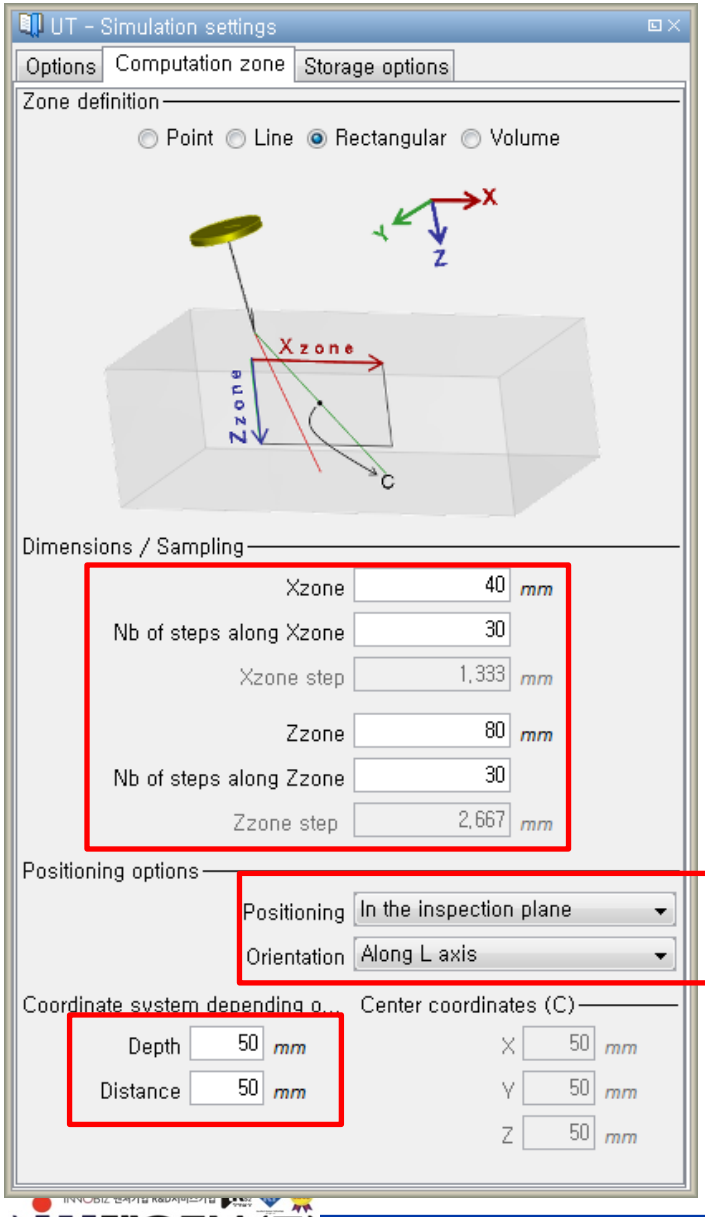


❖Inspection with a focused transducer

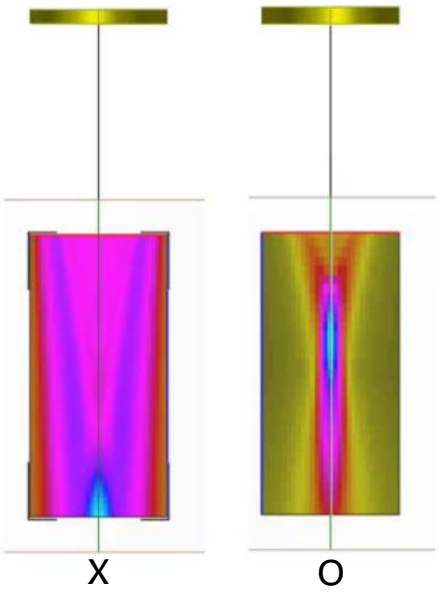


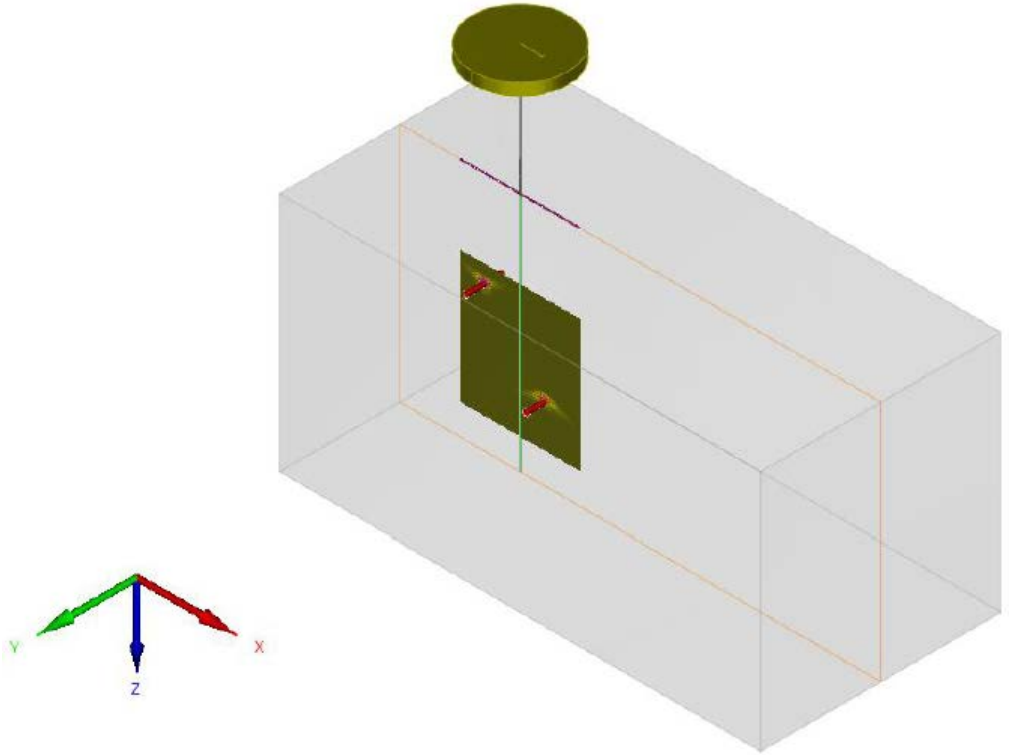


❖Simulation Settings



- Focusing surface 여부에 따른 결과 차이





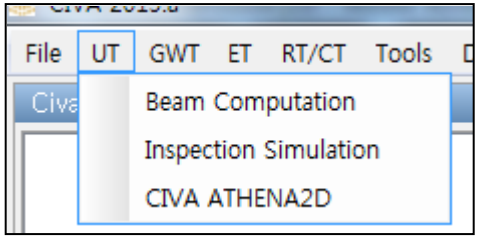
❖Example – Immersion Testing

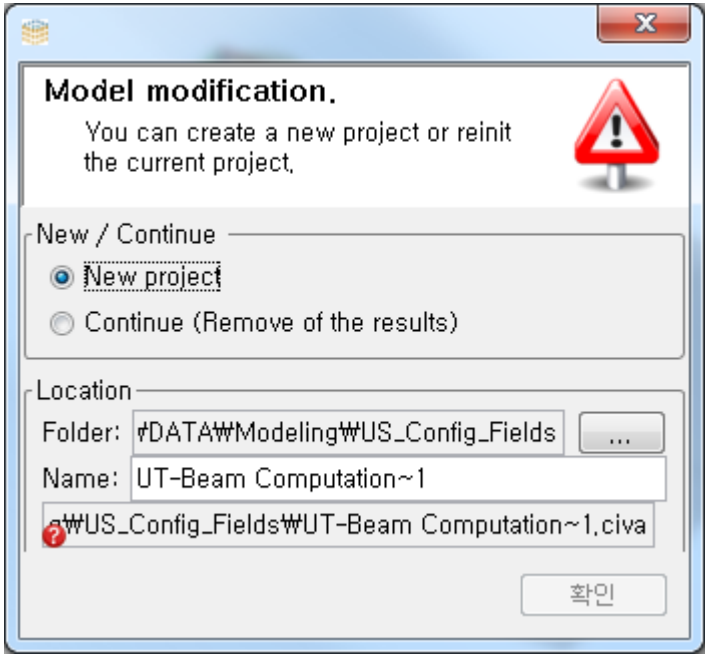
- 1. L0 inspection with a non-focused transducer
- 2. L0 inspection with a spherically focused transducer
- 3. L60 inspection

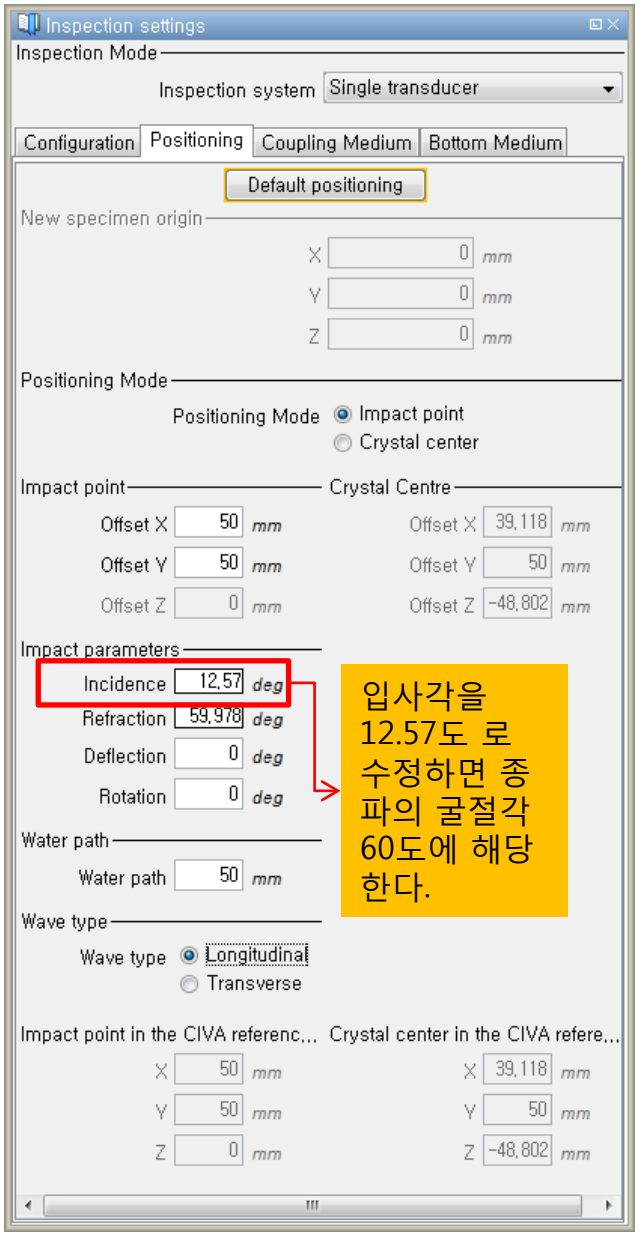
❖L60도 해석 준비 및 Inspection 설정

- Beam Computation 모드
- Create a new file 및 save 파일

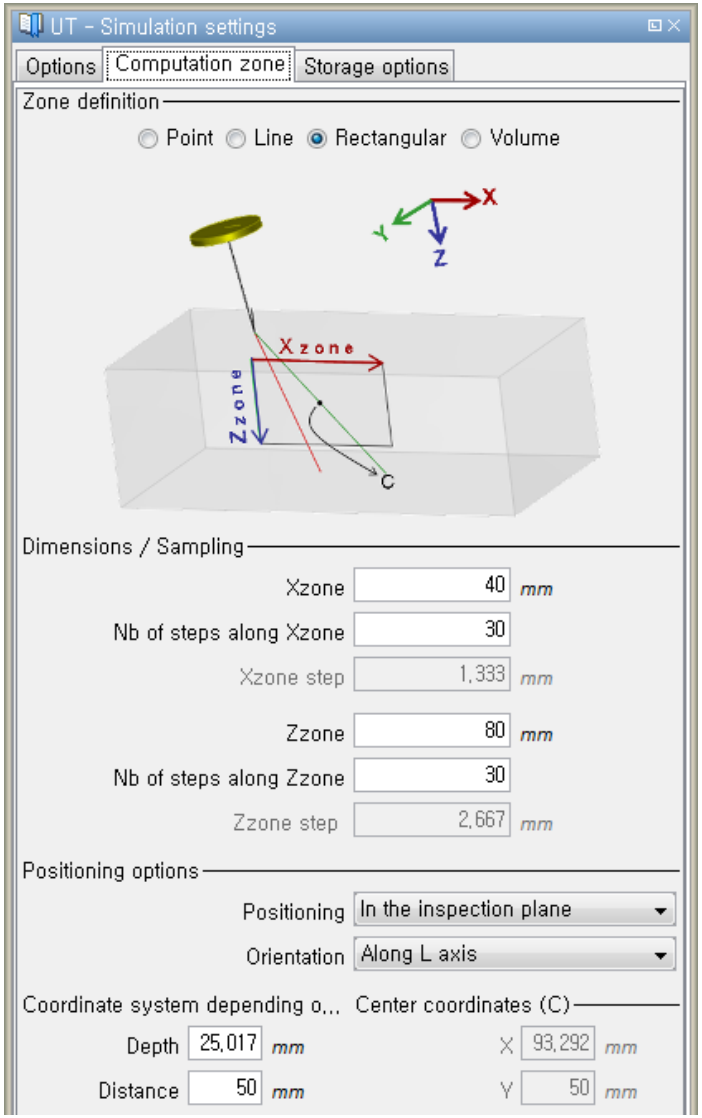
- Inspection setting – Positioning 선택

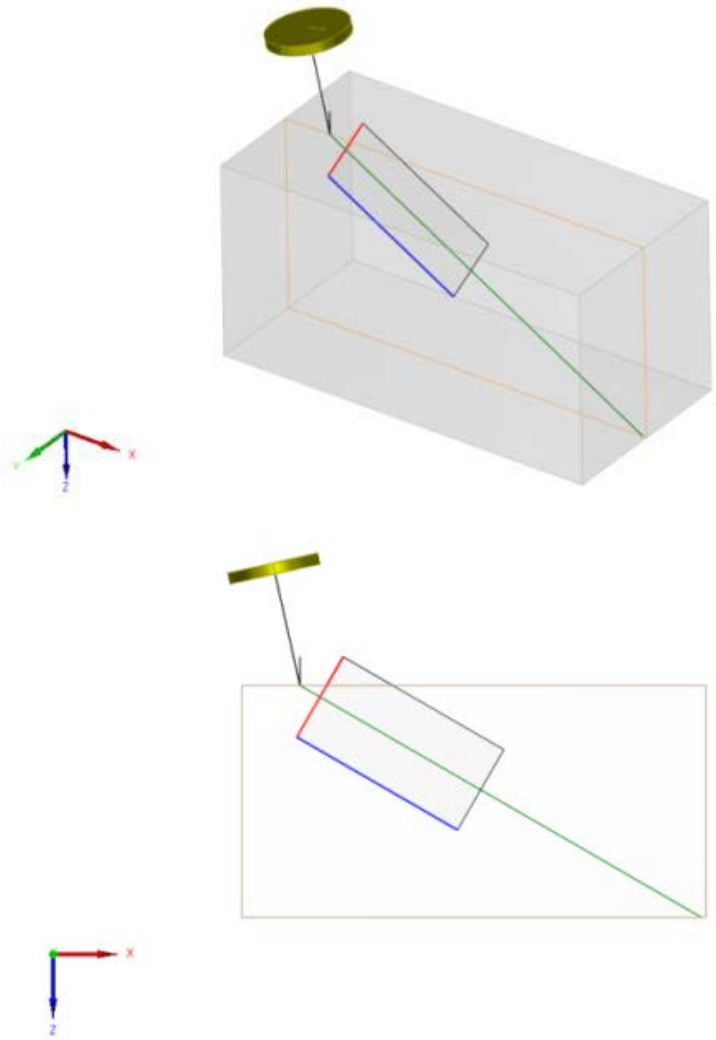




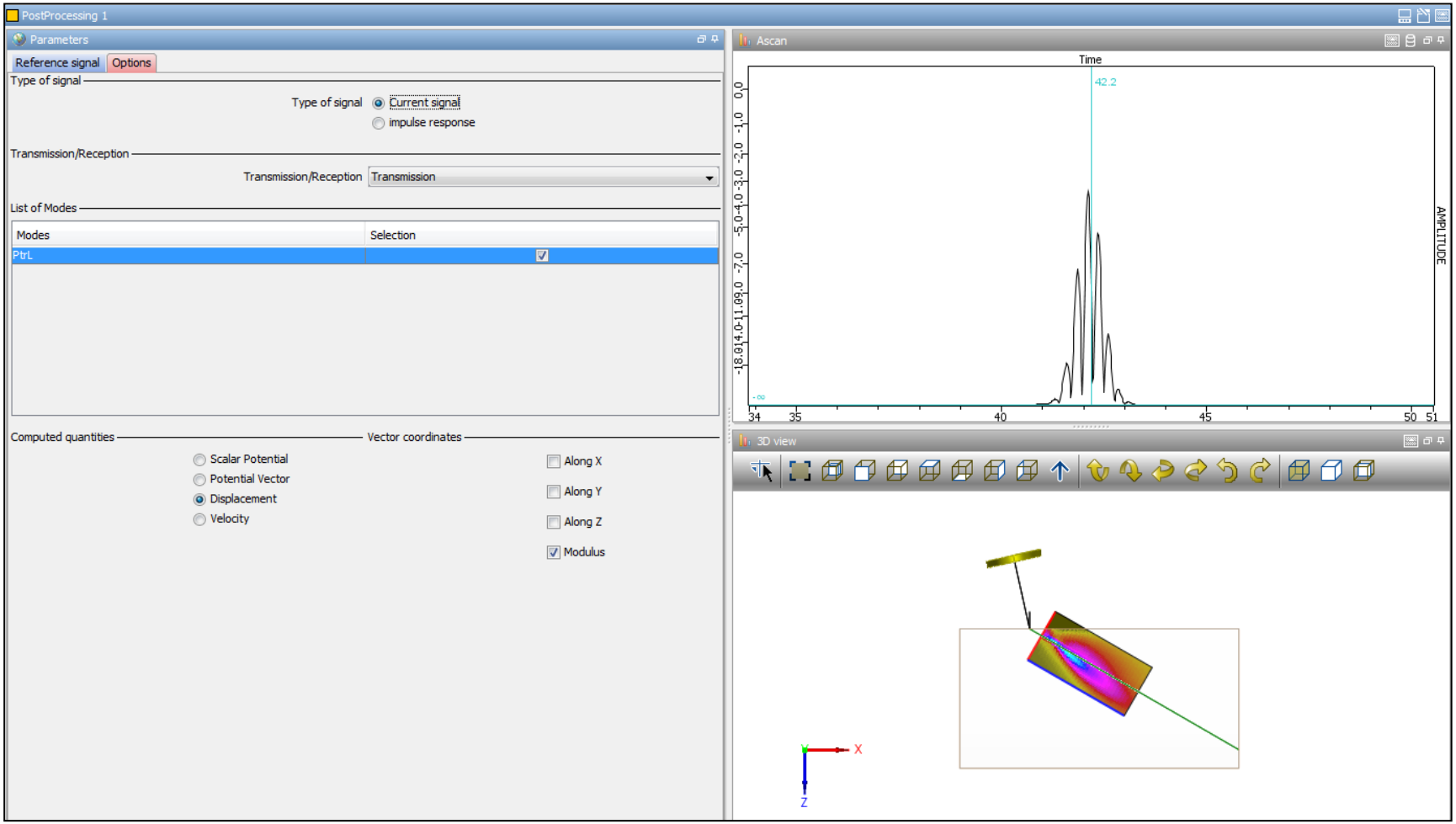


❖Simulation 설정(해석 영역 선정)

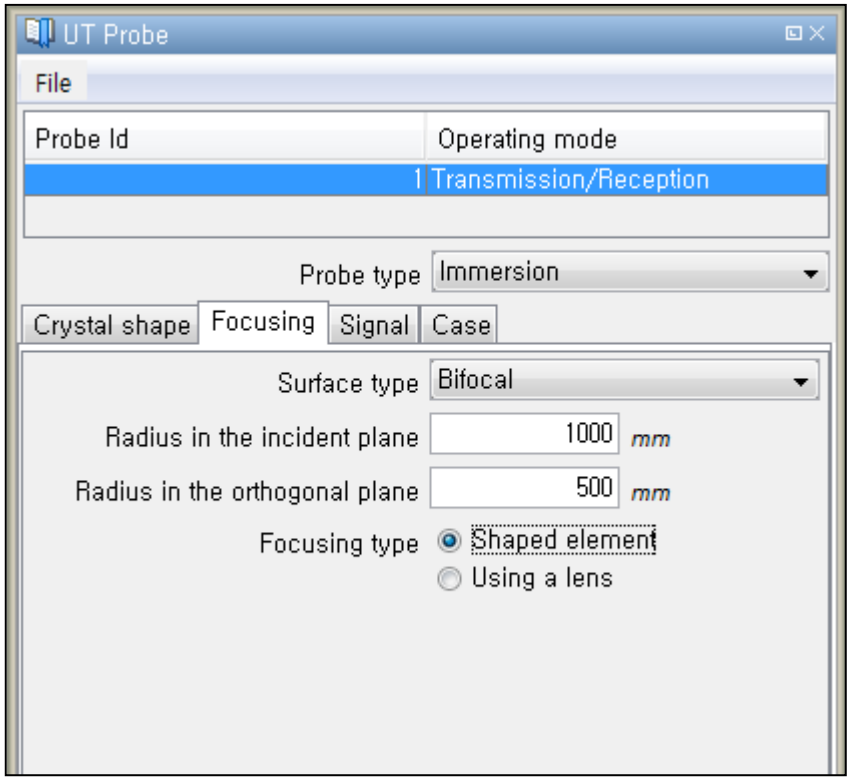


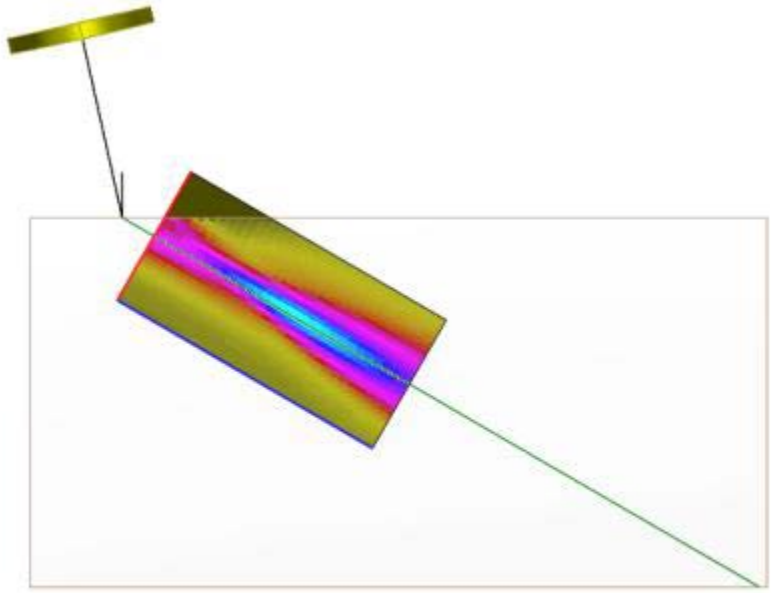


❖해석 및 결과 확인


PostProcessing 1
Parameters
Reference signal
Options
Type of signal
Type of signal
Current signal
impulse response
Transmission/Reception
Transmission/Reception
Transmission
List of Modes
Modes
Selection
PtrL
Computed quantities
Vector coordinates
Scalar Potential
Potential Vector
Displacement
Velocity
Along X
Along Y
Along Z
Modulus
Ascan
Time
42.2
AMPLITUDE
3D view
X
Z

❖Bifocal 계산 설정 및 결과





Thank You !

대한민국 전기 · 기계

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cae@jaewoo.com