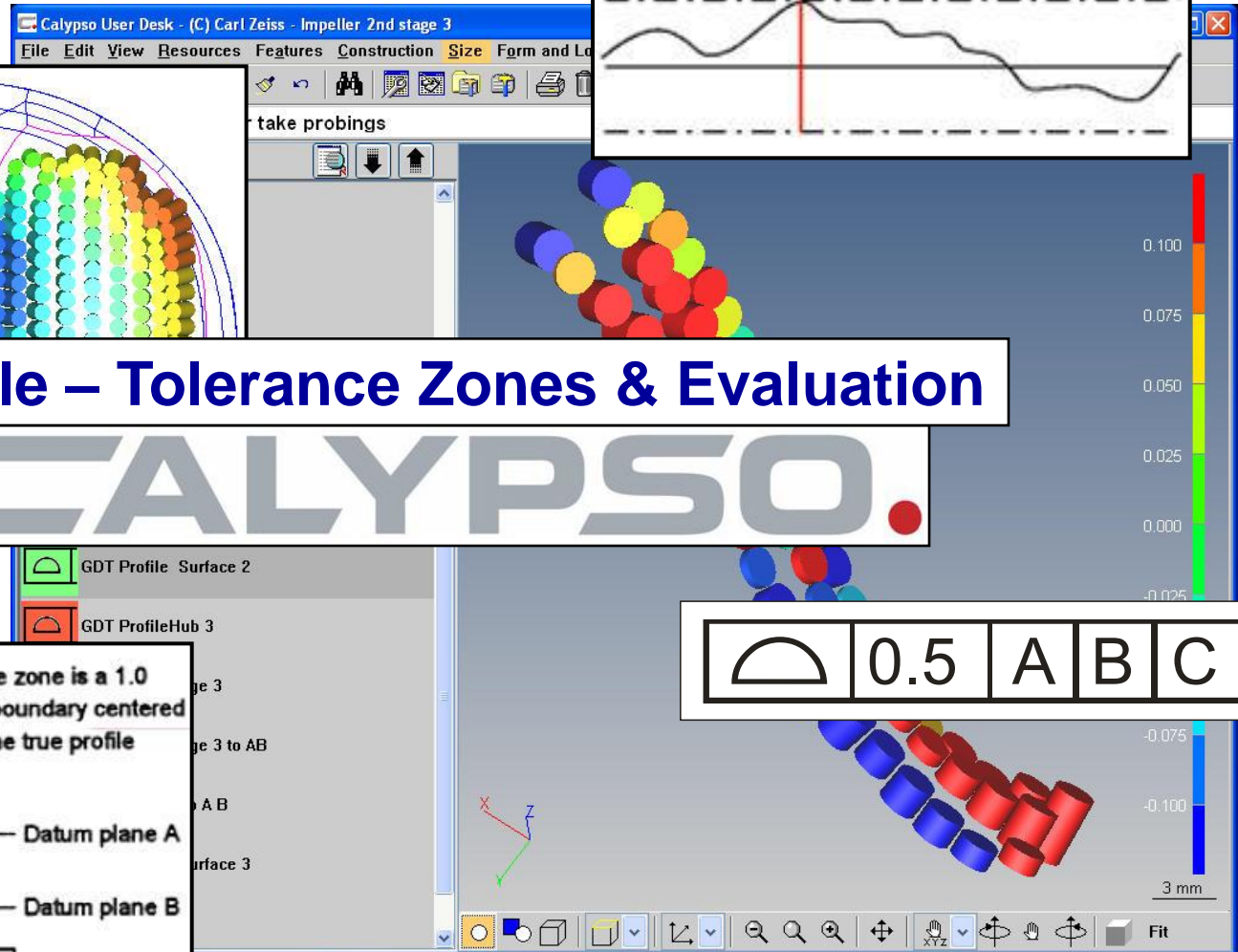
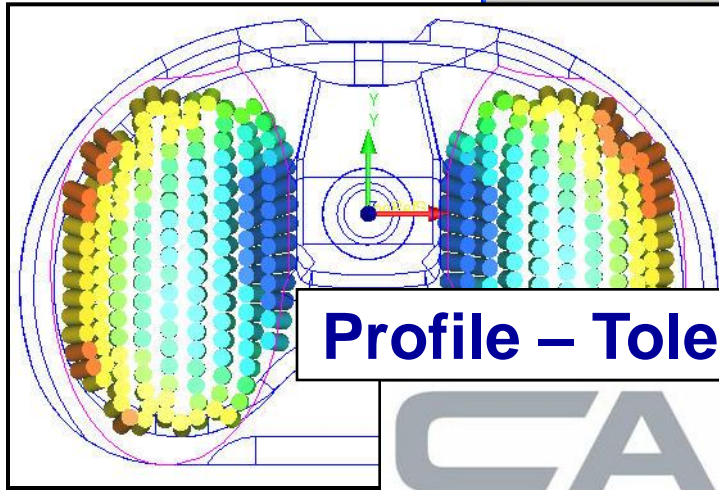


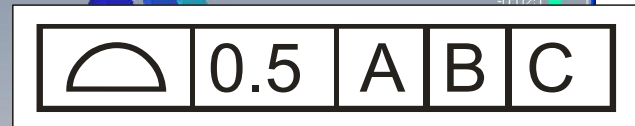
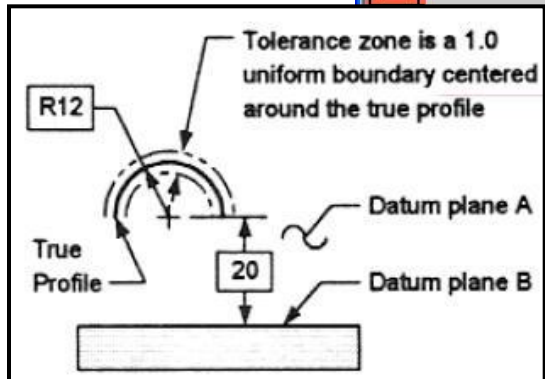


RESULTS  
you can trust.

Carl Zeiss IMT

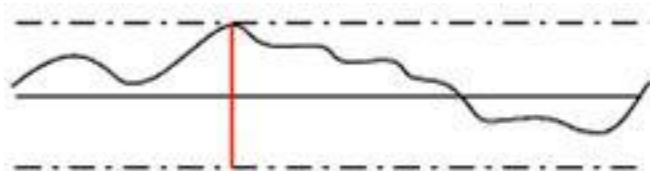


## Profile – Tolerance Zones & Evaluation







## Profile – Tolerance Zones and Evaluation

- **Scope**
- **Shape Of Zone – Size and location of tolerance zones in Calypso Profile characteristic.**
- **Evaluation methods for each.**





**GDT Profile**


 GDT Profile1

Bilateral - one result  
Bilateral with unequal distribution - one result  
Unilateral (nominal contour inside)  
Unilateral (nominal contour outside)  
Bilateral - two results  
Bilateral with unequal distribution - two results  
Outwards into infinity  
Inwards into infinity

 Datum A

 Secondary Datum  
Datum B

 Tertiary Datum

Actual

# Profile – on-line help

HTML Help

Hide

Back

Forward

Print

Options

Contents

Index

Search

Favorites

Type in the keyword to find:

profile

List Topics

Select topic to display:

Activating the automatic login ()

Assigning user privileges ()

Basics about filtration and outliers ()

Change password ()

Characteristics for Form and Locati...

Characteristics for the curve ()

Circle in contour best fit constructio...

Creating an intersection plane ()

Defining the Line Profile characterist...

Defining the Line Profile characterist...

Definition template (additional featur...

Definition template (additional featur...

Definition template (Circle in Contour...

Definition template (GDT Profile / GD...

Definition template (GDT Profile / GD...

Details on circle in contour best fit ()

Dimension Form and Position from ...

DIN ISO 1101 Profile ()

DIN ISO 1101 Profile ()

Example: Configuration file for user-...

Example: INI file for printout header ...

File with default name: Internal featu...

Filtration and outlier elimination ()

Form plots ()

GDT Symmetry characteristic ()

Generated characteristics ()

How to set the deviation calculation ...

INI file for printout header data for A...

Intersection of a free form surface ...

Intersection of a plane with a cone ()

Intersection of a plane with a cylind...

Managing users ()

Measurements on the CT dataset ()

Measuring in intersection planes ()

Overview of the features ()

Part alignment basics ()

Preparing a CT dataset for measure...

Profile Elements additional feature ()

Profile Elements additional feature ()

Projection of the results for the curv...

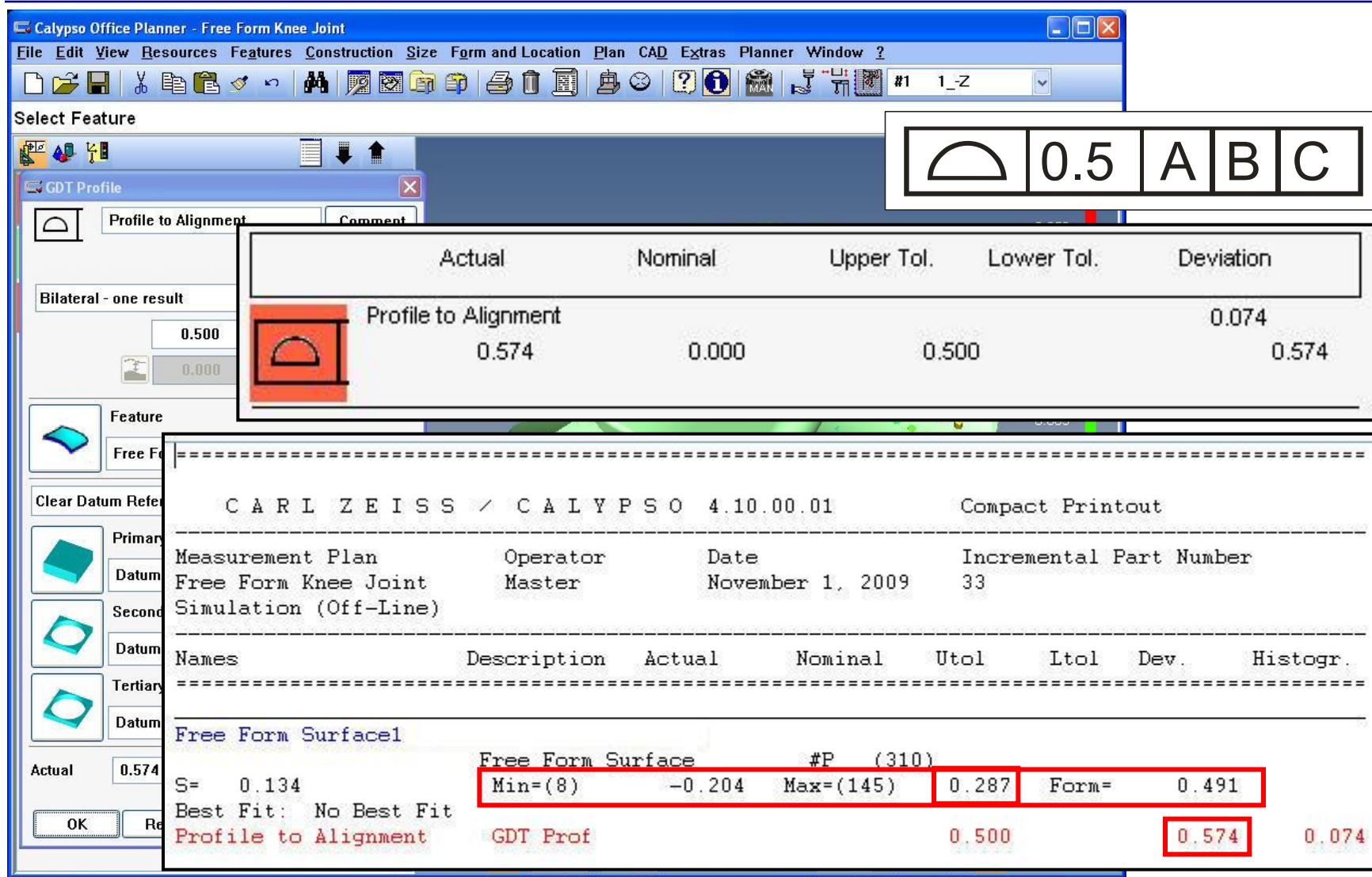
Display

Shape Of Zone	Will be output:	Example
Bilateral – one result	Double the largest deviation (inside and outside)	
Bilateral with unequal distribution – one result	Double the largest deviation (inside and outside) from one of the calculated theoretical center lines	
Unilateral (nominal contour inside)	Double the largest deviation from the tolerance average to the inside or outside	
Unilateral (nominal contour outside)	Double the largest deviation from the tolerance average to the inside or outside	
Bilateral – two results	The largest deviation inside (minimum) and the largest deviation outside (maximum) the workpiece	
Bilateral with unequal distribution – two results	The largest deviation inside (minimum) and the largest deviation outside (maximum) the workpiece	
Outwards into infinity	The largest deviation inside the workpiece	
Inwards into infinity	The largest deviation outside the workpiece	

Calculation of deviations for the general surface

## Bilateral

### Double the largest deviation (inside and outside)







## Profile – Additional Information (4.10 – 5.0)

Calypso Office Planner - Free Form Knee Joint

File Edit View Resources Features Construction Size Form and Location Plan CAD Extras

ZEISS Calypso 4.10.00.01 Carl Zeiss Date Order October 30, 2009 \* order \*

Part Number 27 CMM Prismo Drawing No. \* drawingno \*

Measurement Plan Free Form Knee Joint Operator Master Signature: Profile to Alignment

142	Dist	0.202		0.250	-0.250	0.202	---
	X	30.744	30.833			-0.089	
	Y	2.377	2.425			-0.047	
	Z	11.750	11.546			0.204	
143	Dist	0.227		0.250	-0.250	0.227	---
	X	30.678	30.777			-0.098	
	Y	4.390	4.451			-0.061	
	Z	12.256	12.033			0.223	
144	Dist	0.252		0.250	-0.250	0.252	0.002
	X	30.308	30.408			-0.100	
	Y	6.354	6.429			-0.075	
	Z	12.692	12.455			0.237	
	Dist	0.268		0.250	-0.250	0.268	0.018
145*	X	30.643	30.755			-0.112	
	Y	8.229	8.318			-0.089	
	Z	13.488	13.239			0.249	
	Dist	0.287		0.250	-0.250	0.287	0.037
146	X	32.309	32.437			-0.128	
	Y	6.977	7.054			-0.077	
	Z	13.876	13.647			0.229	
	Dist	0.273		0.250	-0.250	0.273	0.023
147	X	32.879	33.013			-0.134	
	Y	5.032	5.099			-0.066	
	Z	13.592	13.366			0.226	
	Dist	0.271		0.250	-0.250	0.271	0.021

Actual OK Reset

OK Reset

14

Y	-15.105	-15.095			-0.010
Z	11.789	11.588			-0.129
Dist	-0.153		0.250	-0.250	-0.153
X	11.425	11.490			-0.065
Y	-15.701	-15.688			-0.013
Z	11.736	11.844			-0.108
Dist	-0.127		0.250	-0.250	-0.127
X	12.099	12.145			-0.046
Y	-17.640	-17.627			-0.013
Z	11.643	11.725			-0.082
Dist	-0.095		0.250	-0.250	-0.095
X	13.993	14.020			-0.027
Y	-18.223	-18.213			-0.010
Z	10.823	10.886			-0.063
Dist	-0.069		0.250	-0.250	-0.069
X	13.941	13.960			-0.040
Y	-16.217	-16.206			-0.011
Z	10.526	10.616			-0.091
Dist	-0.100		0.250	-0.250	-0.100

1/19

## Profile – Additional Information (5.2)

Calypso Office Planner - Free Form Knee Joint

File Edit View Resources Features Construction Size Form and Location Plan CAD Extras

Select Fe

Form Plot Profile to Alignment

Point List

		Actual	Nominal	Upper Tolerance	Lower Tolerance	Deviation
7	X	11.050	11.156			
	Y	-1.475	-1.502			
	Z	12.175	12.342			
	Dist	-0.200		0.250	-0.250	-0.200
8/Min	X	11.043	11.151			
	Y	-3.498	-3.519			
	Z	11.893	12.065			
	Dist	-0.204		0.250	-0.250	-0.204
9	X	11.037	11.144			
	Y	-5.542	-5.556			
	Z	11.697	11.868			
	Dist	-0.202		0.250	-0.250	-0.202
144	X	30.308	30.408			
	Y	6.354	6.429			
	Z	12.692	12.455			
	Dist	0.268		0.250	-0.250	0.268
145/Max	X	30.643	30.755			
	Y	8.229	8.318			
	Z	13.488	13.239			
	Dist	0.287		0.250	-0.250	0.287
146	X	32.309	32.437			
	Y	6.977	7.054			
	Z	13.876	13.647			
	Dist	0.273		0.250	-0.250	0.273

Actual

OK Reset

OK Reset

ZEISS Calypso 5.2.04

Carl Zeiss

Datum 7 September 2011

Auftrag \* order \*

Teil-Nummer 42 KMG Prismo Zeichnungsnummer \* drawingno \*

Prüfplan Free Form Knee Joint

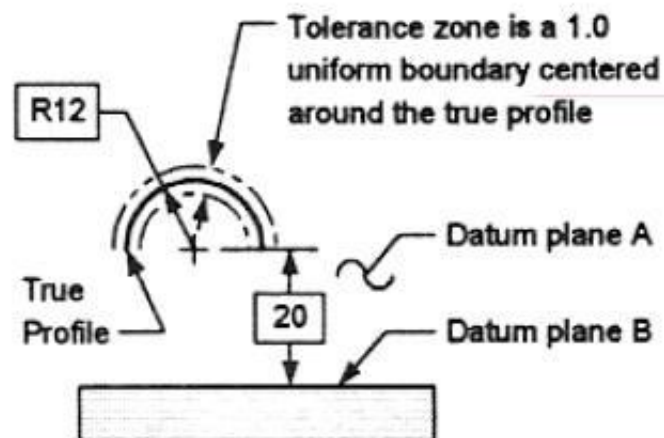
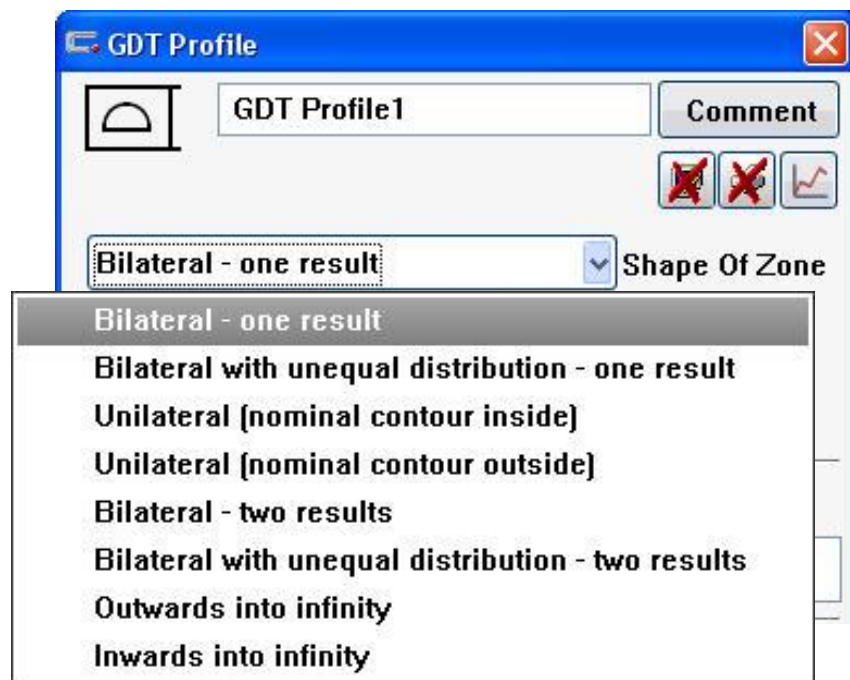
Profile to Alignment

		Actual	Nominal	Upper Tolerance	Lower Tolerance	Deviation
1	X	11.129	11.163			-0.034
	Y	7.799	7.781			0.018
	Z	14.656	14.707			-0.051
	Dist	-0.063		0.250	-0.250	-0.063
9	Z	11.893	12.065			-0.172
	Dist	-0.204		0.250	-0.250	-0.204
9	X	11.037	11.144			-0.107
16	Dist	-0.095		0.250	-0.250	-0.095
	X	13.993	14.020			-0.027
	Y	-18.223	-18.213			-0.010
	Z	10.823	10.886			-0.063
	Dist	-0.069		0.250	-0.250	-0.069
17	X	13.941	13.980			-0.040
	Y	-16.217	-16.206			-0.011
	Z	10.826	10.616			-0.091
	Dist	-0.100		0.250	-0.250	-0.100

1/19

## Bilateral – one result

Double the largest deviation (inside and outside)

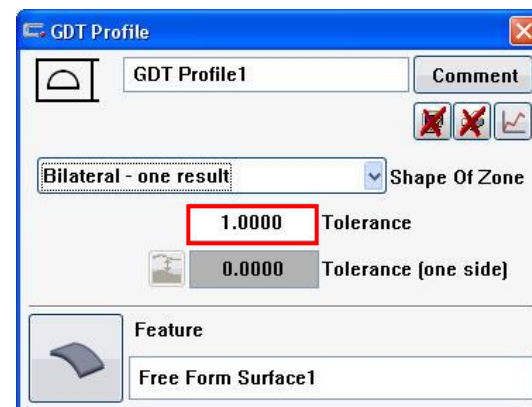
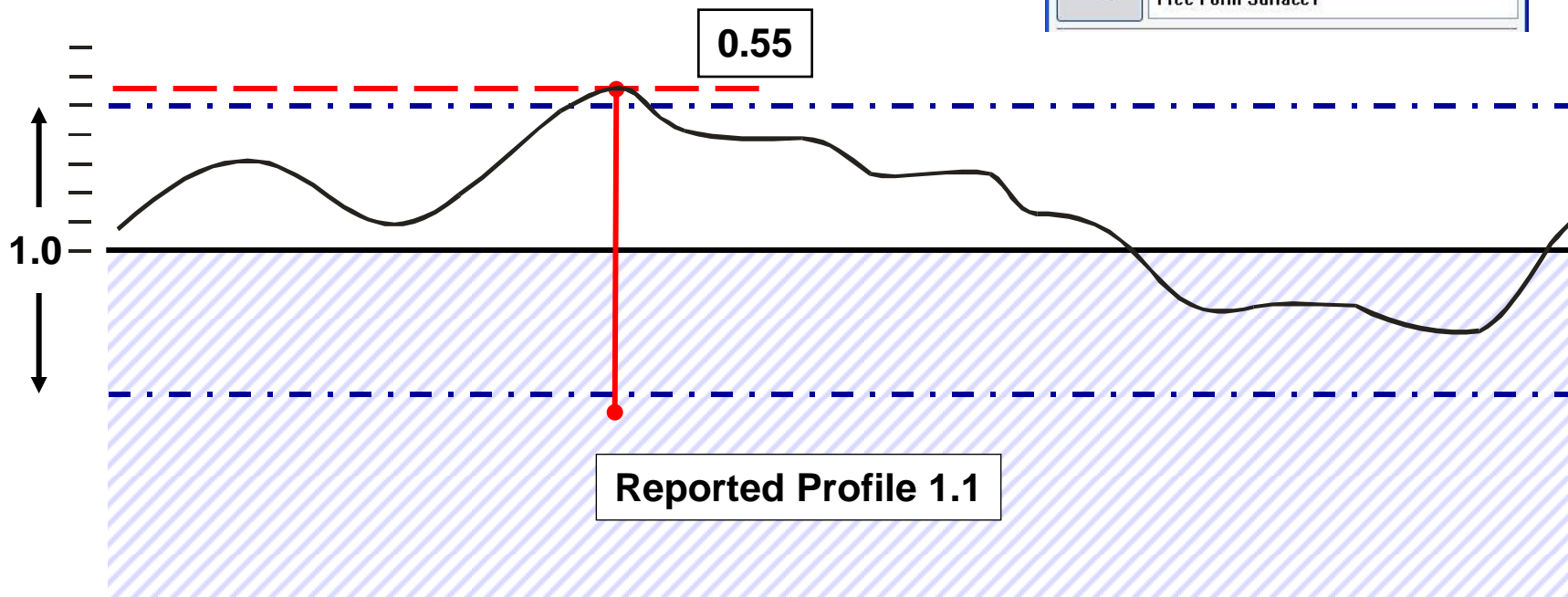


## Bilateral – one result

Double the largest deviation (inside and outside)



### Size and Location of Tolerance Zone



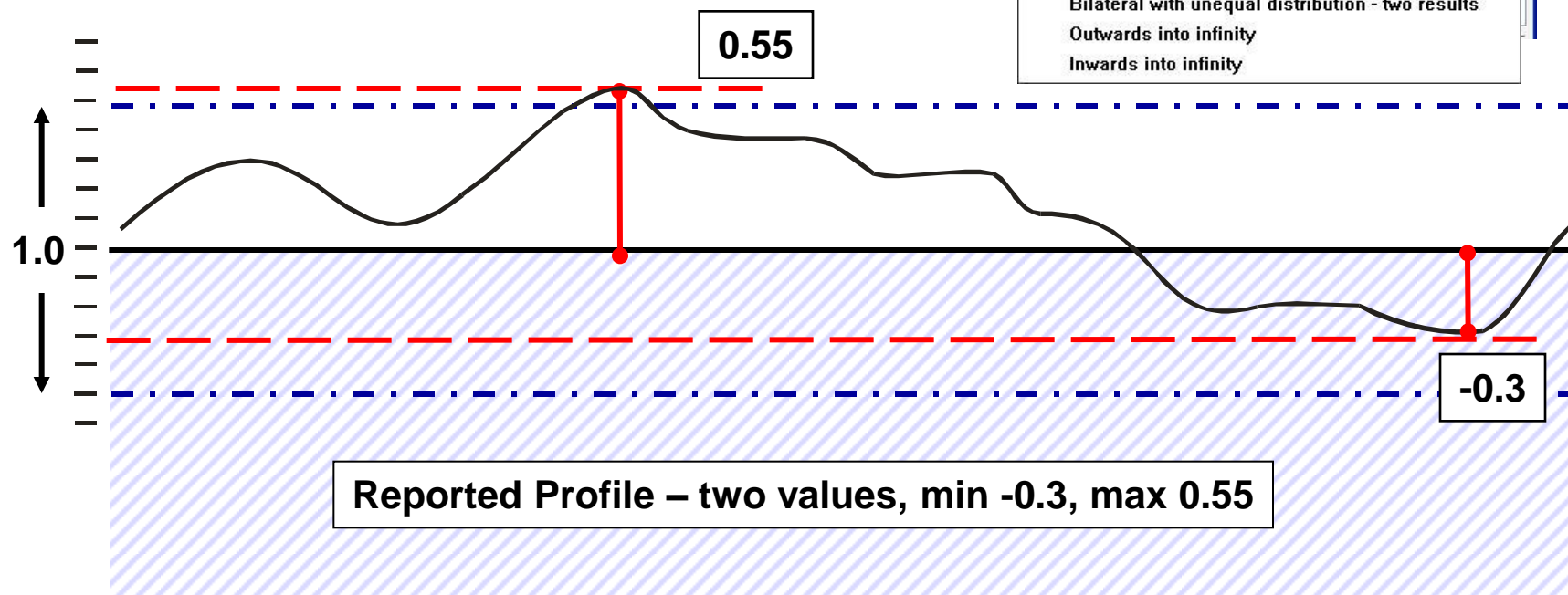
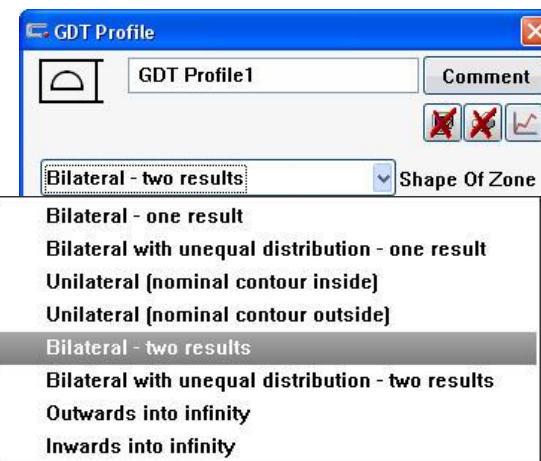


## Bilateral – two results (5.2)

The largest deviation inside and the largest deviation outside the workpiece.

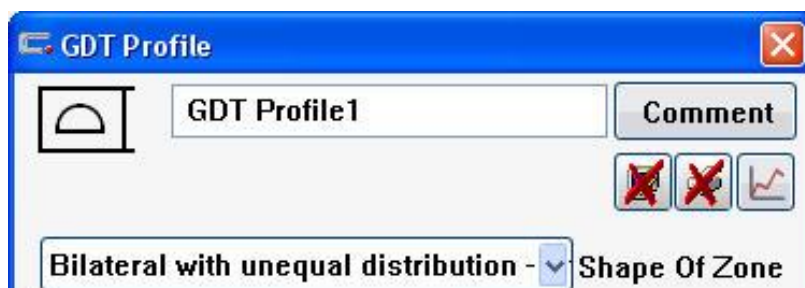


	Profile1^Min					---
		-0.300	0.000	0.500	-0.500	-0.300
	Profile1^Max					0.050
		0.550	0.000	0.500	-0.500	0.550



## Bilateral - (unequal distribution) – one result

Double the largest deviation (inside and outside) from the calculated theoretical center line



Bilateral - one result

**Bilateral with unequal distribution - one result**

Unilateral (nominal contour inside)

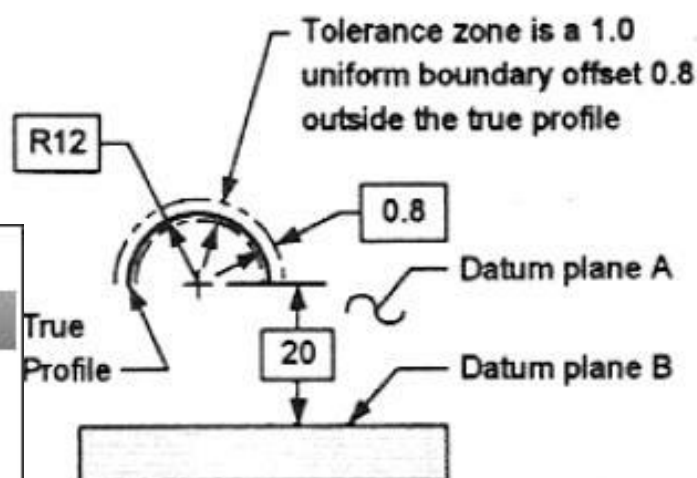
Unilateral (nominal contour outside)

Bilateral - two results

Bilateral with unequal distribution - two results

Outwards into infinity

Inwards into infinity

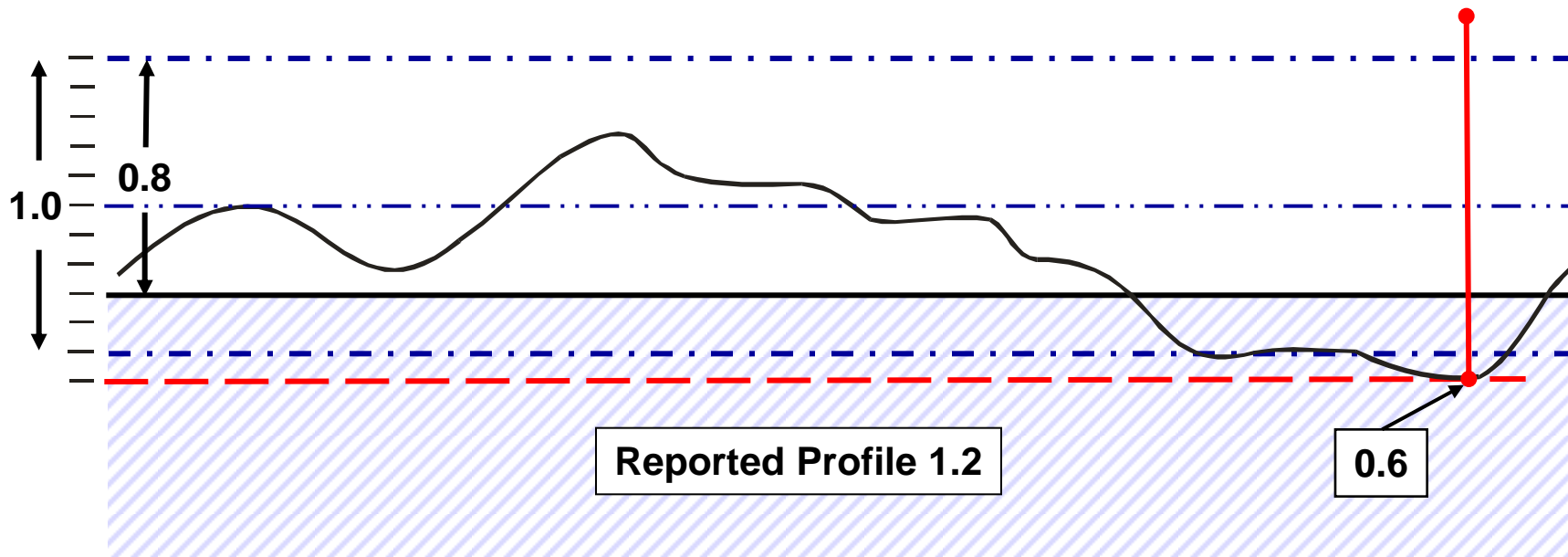
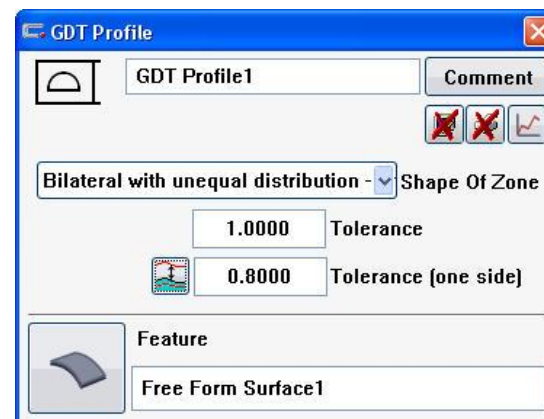


## Bilateral - (unequal distribution) – one result

Double the largest deviation (inside and outside) from the calculated theoretical center line



### Size and Location of Tolerance Zone

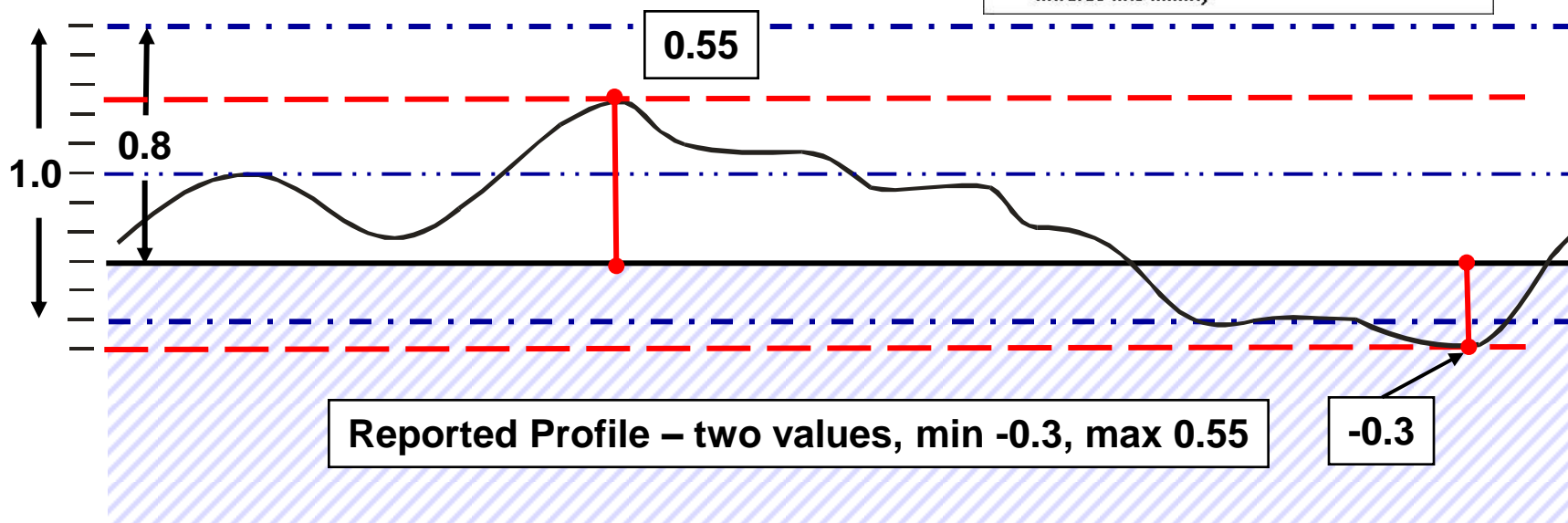
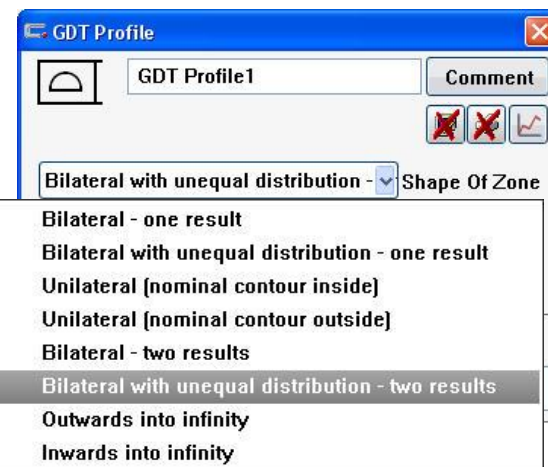


## Bilateral - (unequal distribution) – two results (5.2)

The largest deviation inside and the largest deviation outside the workpiece.



	GDT Profile2*Min	-0.300	0.0000	0.8000	-0.2000	-0.100
	GDT Profile2*Max	0.550	0.0000	0.8000	-0.2000	0.550



## Bilateral – equal & unequal distribution – two results

The largest deviation inside and the largest deviation outside the workpiece.



## Bilateral – two results (5.2)

The largest deviation inside and the largest deviation outside the workpiece.

	Profile1*Min				---
		-0.300	0.000	0.500	-0.500
					-0.300
	Profile1*Max				0.050
		0.550	0.000	0.500	-0.500
					0.550

## Bilateral - (unequal distribution) – two results (5.2)

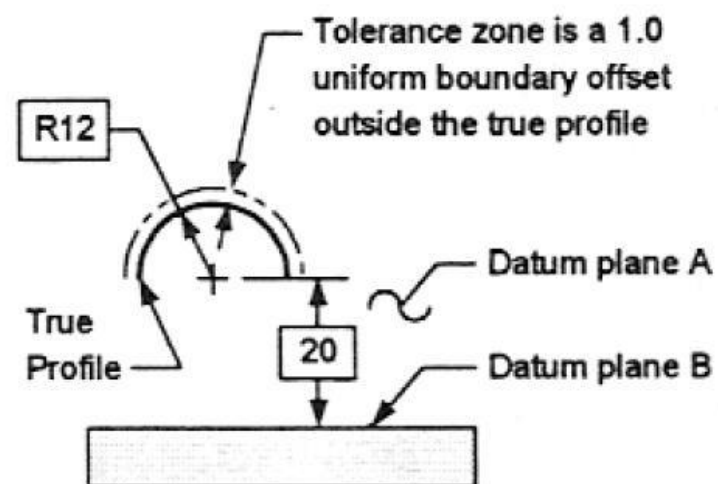
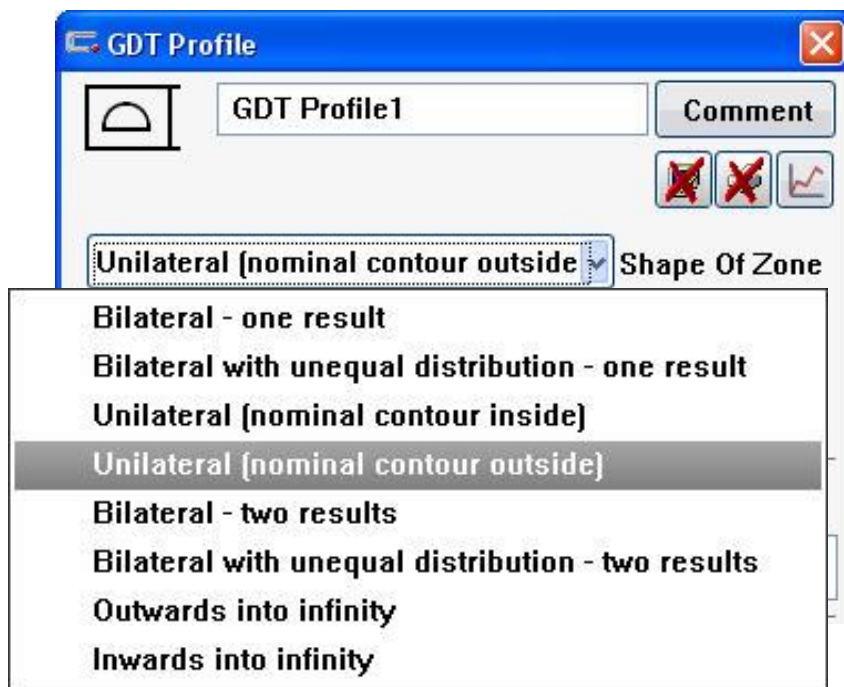
The largest deviation inside and the largest deviation outside the workpiece.

	GDT Profile2*Min				-0.100
		-0.300	0.0000	0.8000	-0.2000
					-0.300
	GDT Profile2*Max				---
		0.550	0.0000	0.8000	-0.2000
					0.550



## Unilateral (nominal contour outside)

Double the largest deviation from the tolerance average to the inside or outside

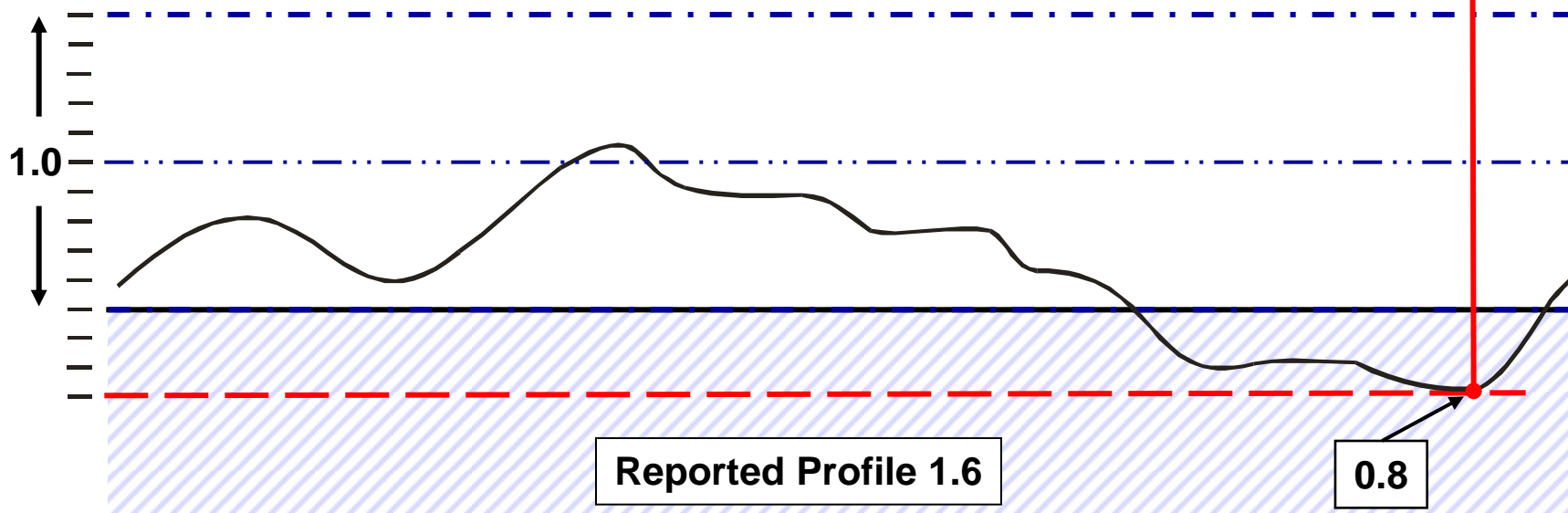
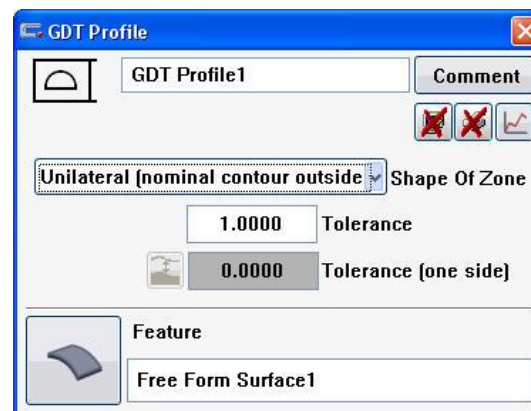


# Unilateral (nominal contour outside)

Double the largest deviation from the tolerance average to the inside or outside



Size and Location of Tolerance Zone

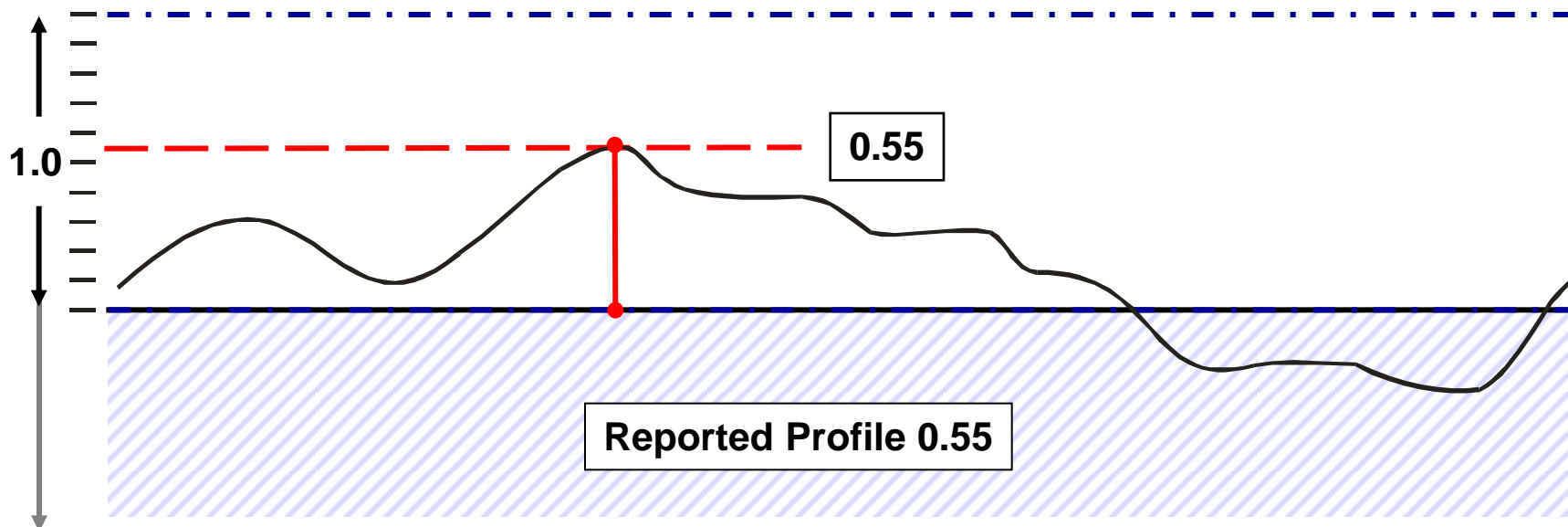
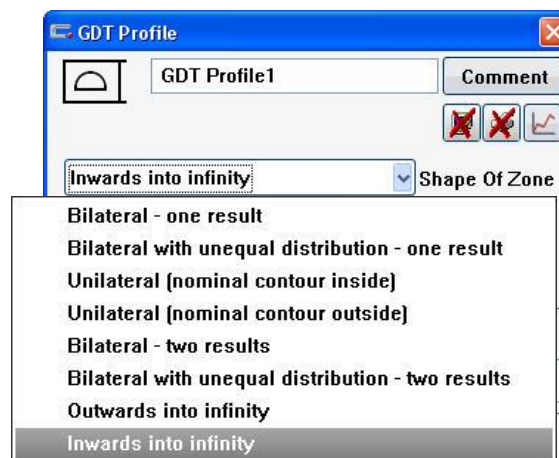


# Inwards into infinity

The largest deviation outside the workpiece

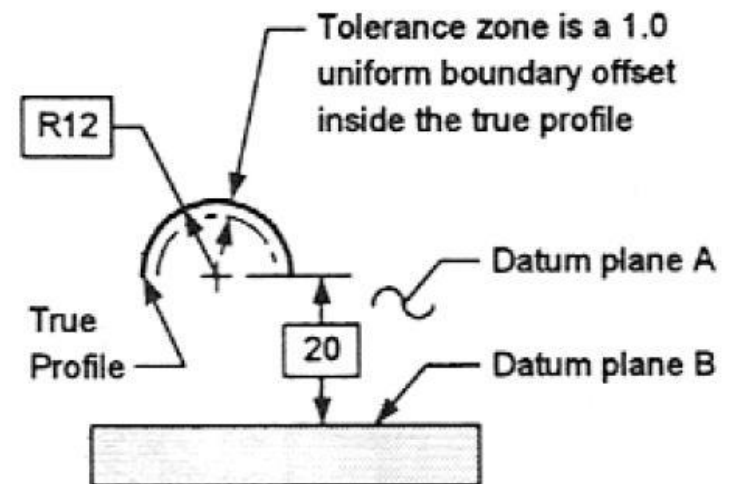
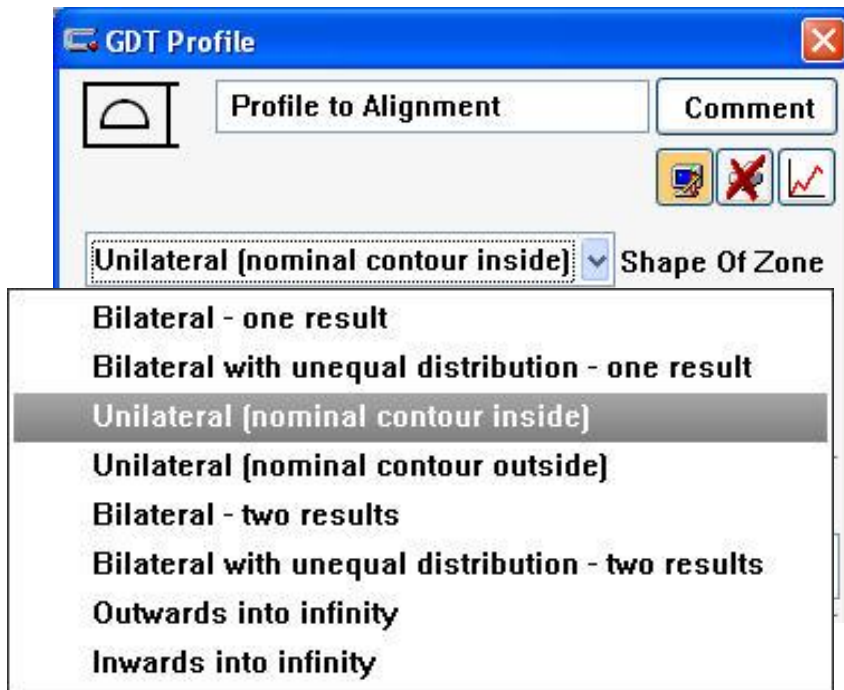


## Size and Location of Tolerance Zone



# Unilateral (nominal contour inside)

Double the largest deviation from the tolerance average to the inside or outside

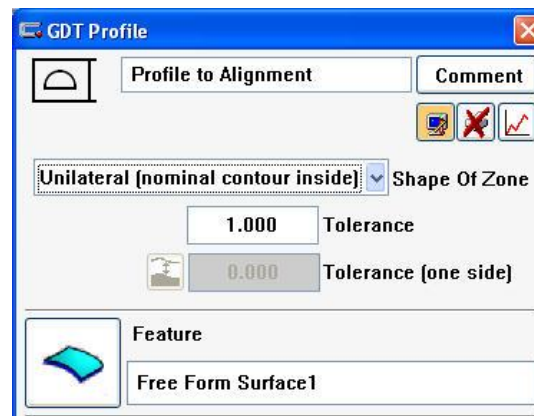
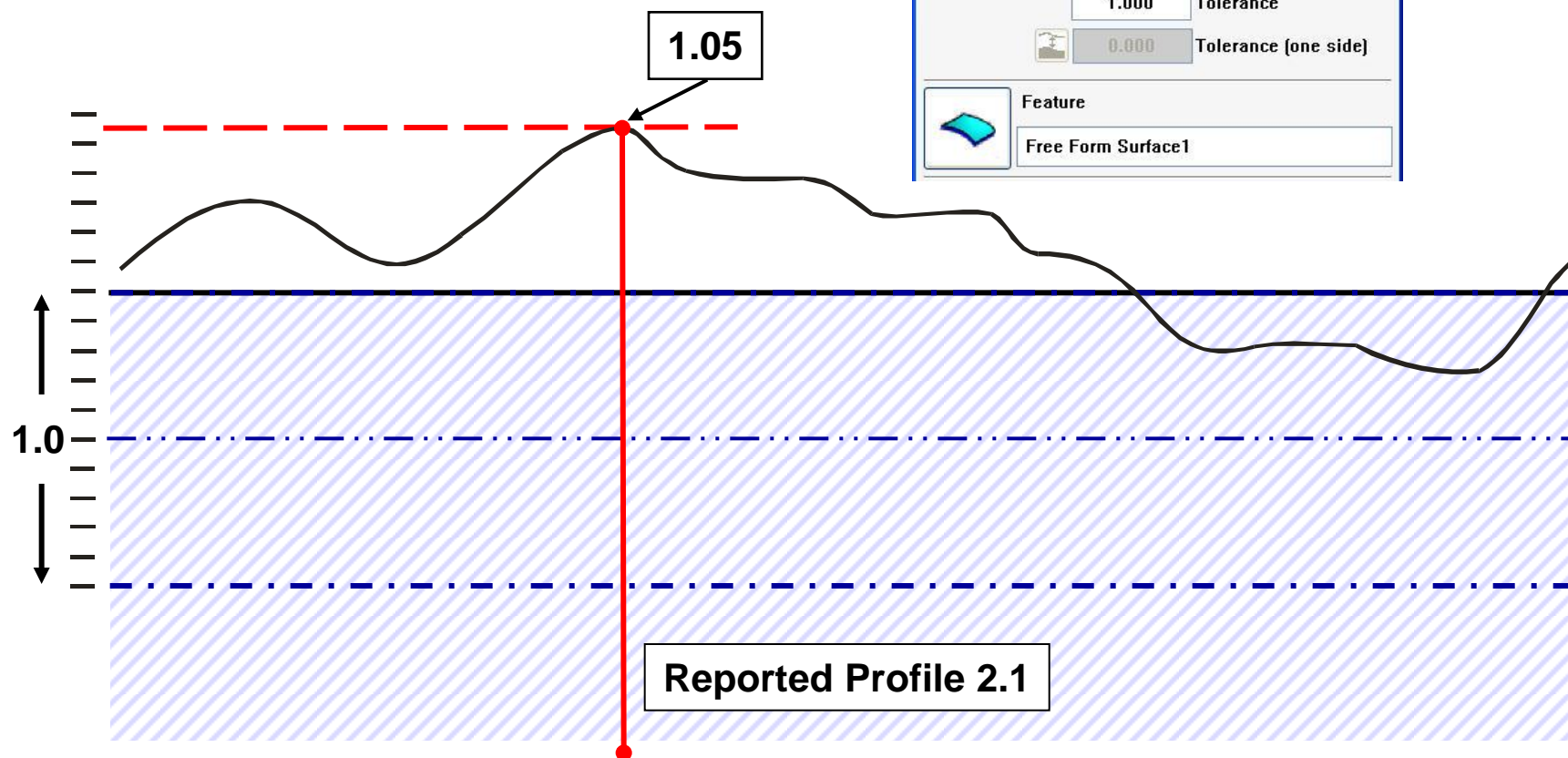


# Unilateral (nominal contour inside)

Double the largest deviation from the tolerance average to the inside or outside



## Size and Location of Tolerance Zone



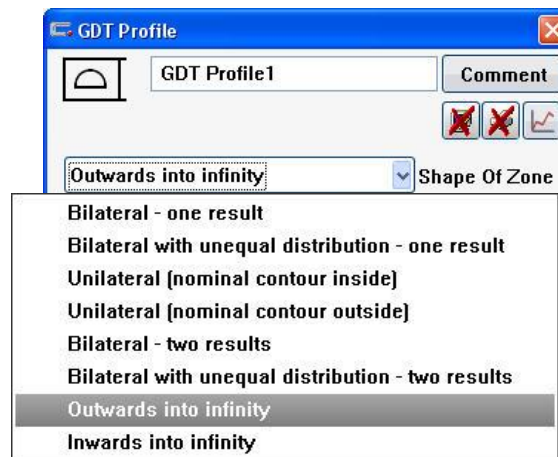
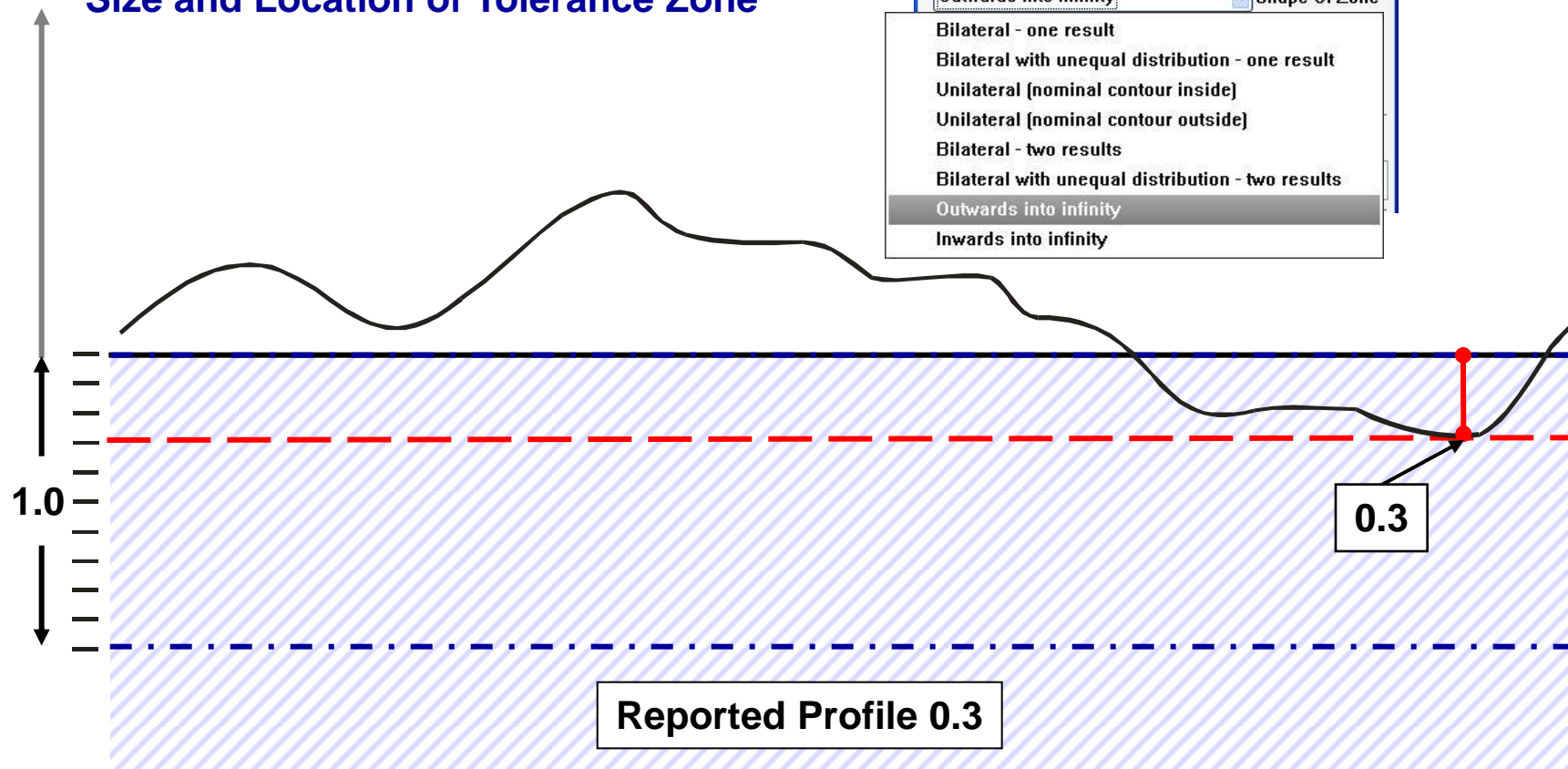


# Outwards into infinity

The largest deviation inside the workpiece



## Size and Location of Tolerance Zone





**CALYPSO.**

Calypso 4.10 - 5.2  
mbusha 2009 - 2011