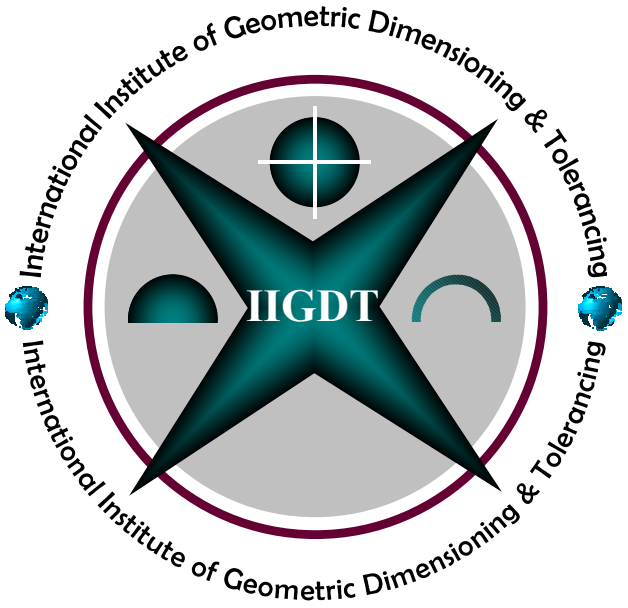
International Institute of GD&T

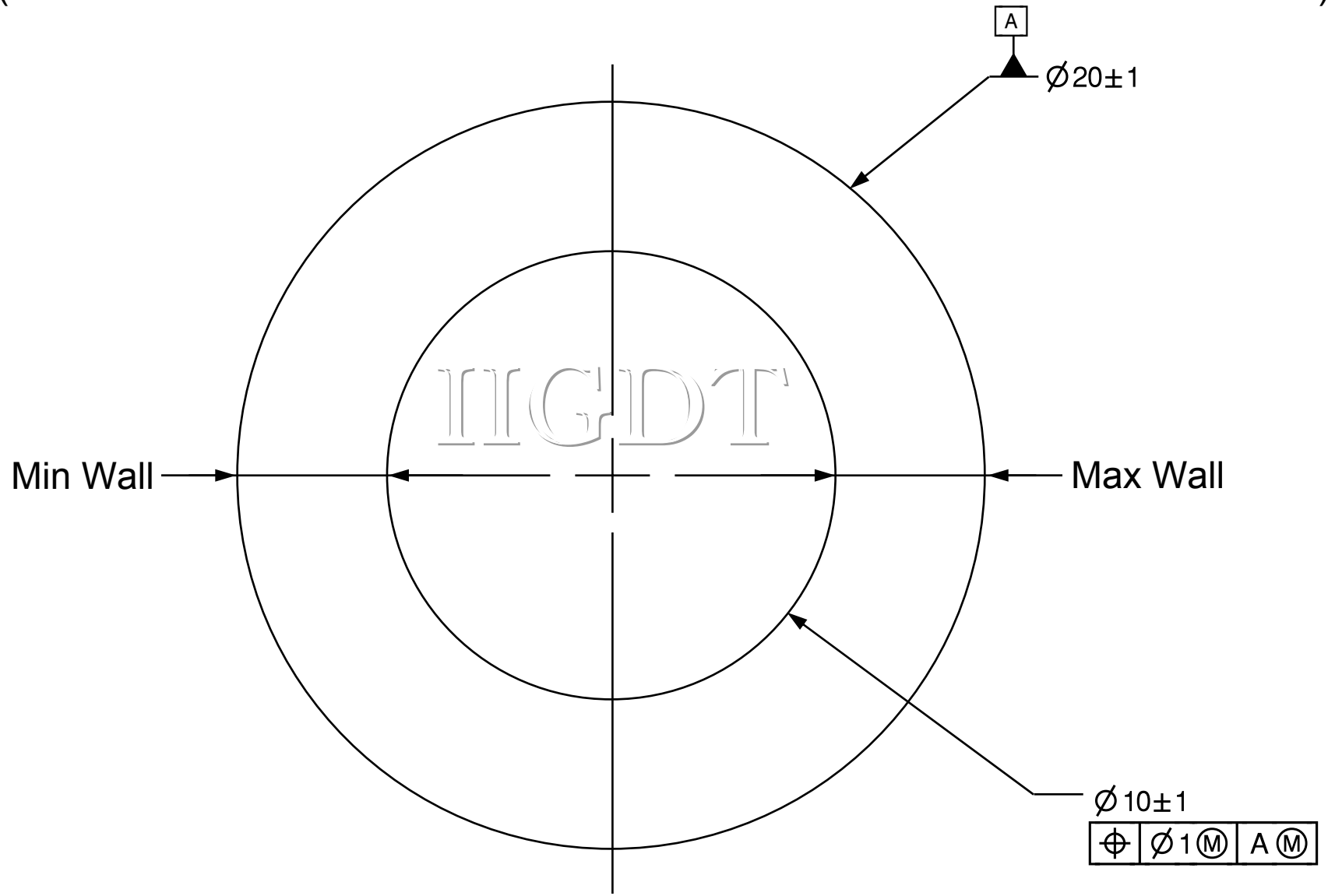


Precision GD&T:
2D Tolerance Analysis - Washer

International Institute of GD&T
12159 Quail Ave Lane N
Stillwater, MN 55082
www.iigdt.com

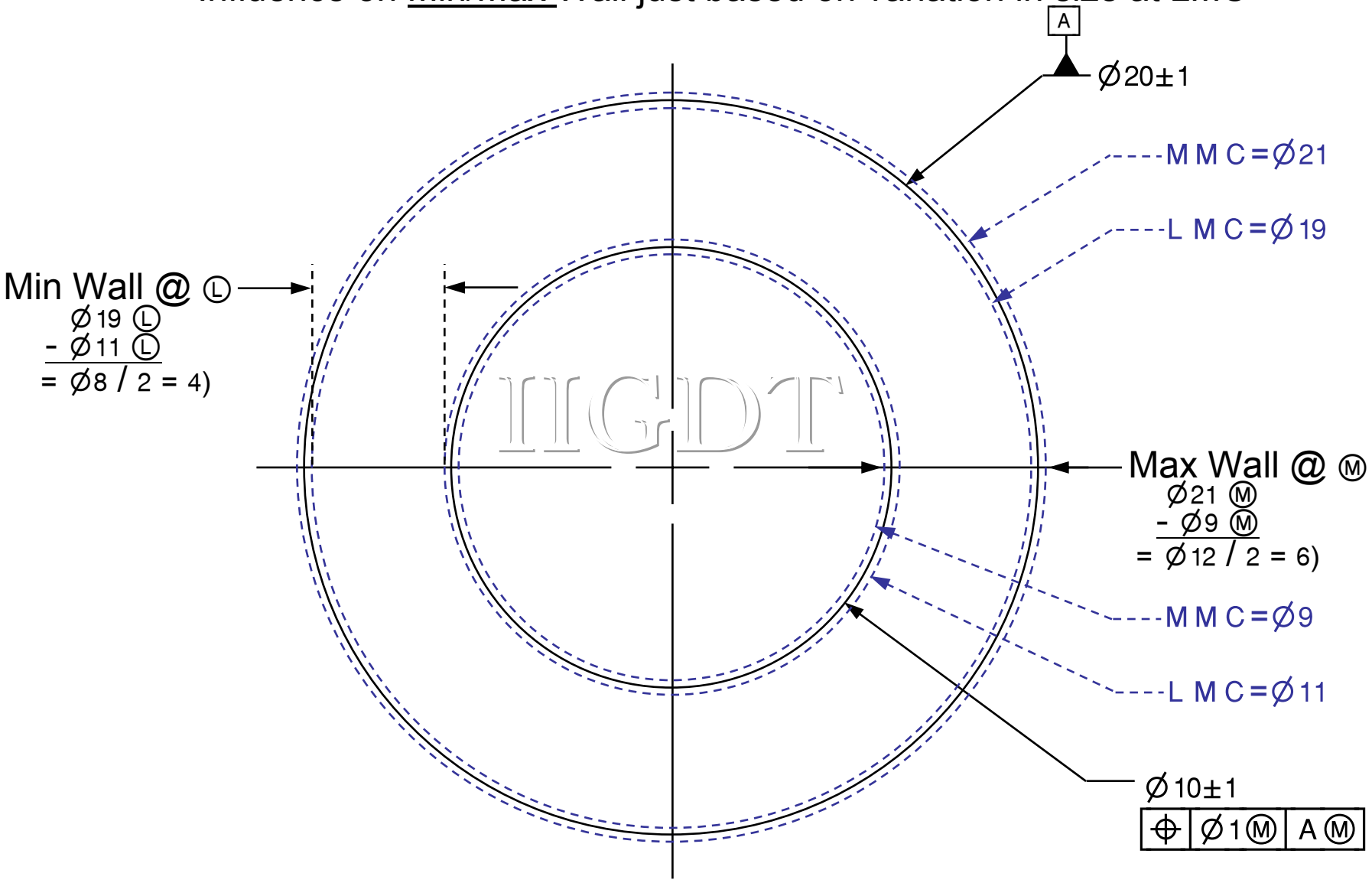
Washer Exercise

Given the callouts on both diameters determine the Minimum and Maximum Wall
(assume no thickness on washer so there will be no influence on rotational error)



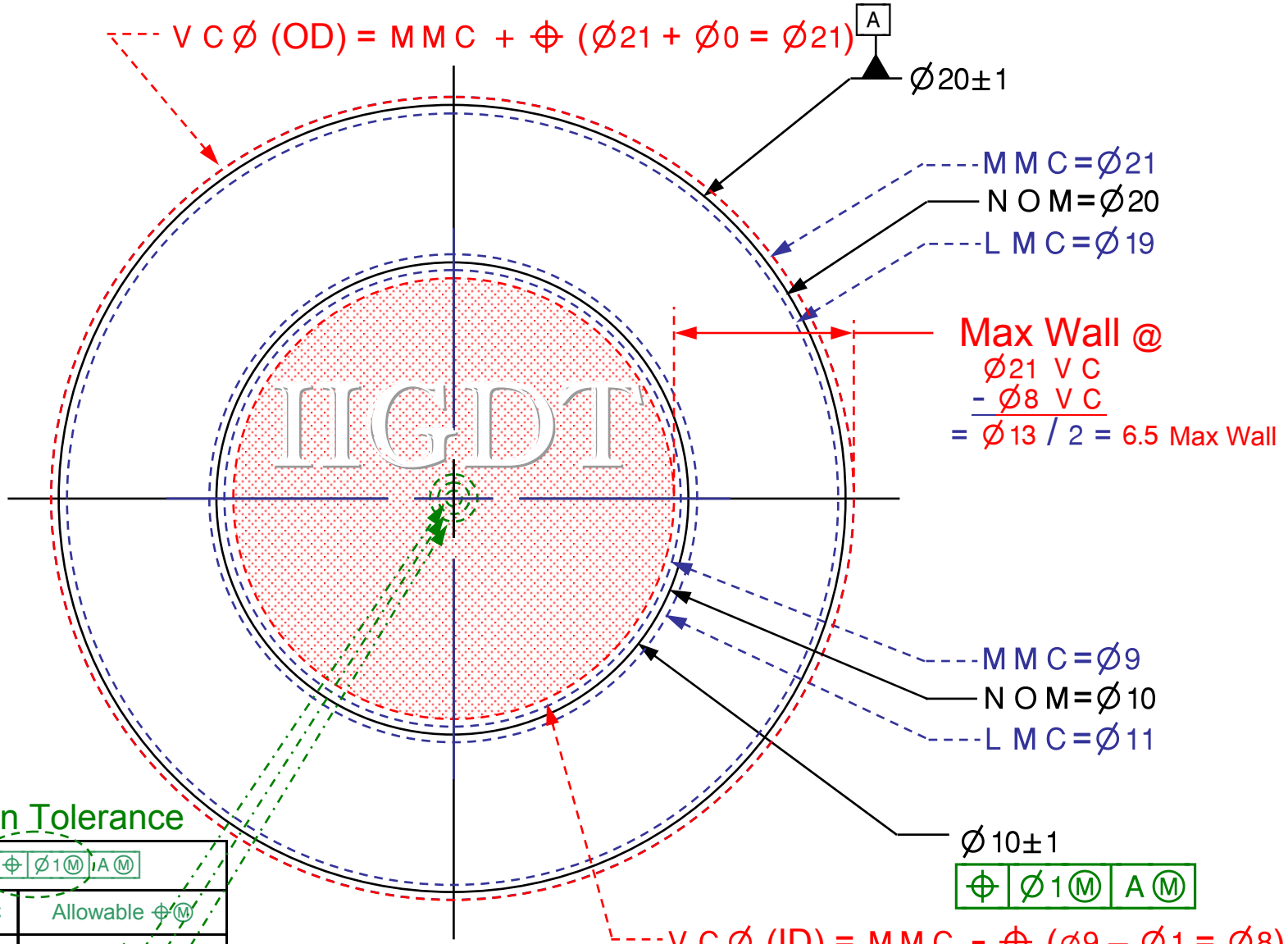
Washer Exercise

Influence on Min/Max Wall just based on variation in size at LMC



Washer Exercise

Max Wall Thickness based on Virtual Condition Boundaries



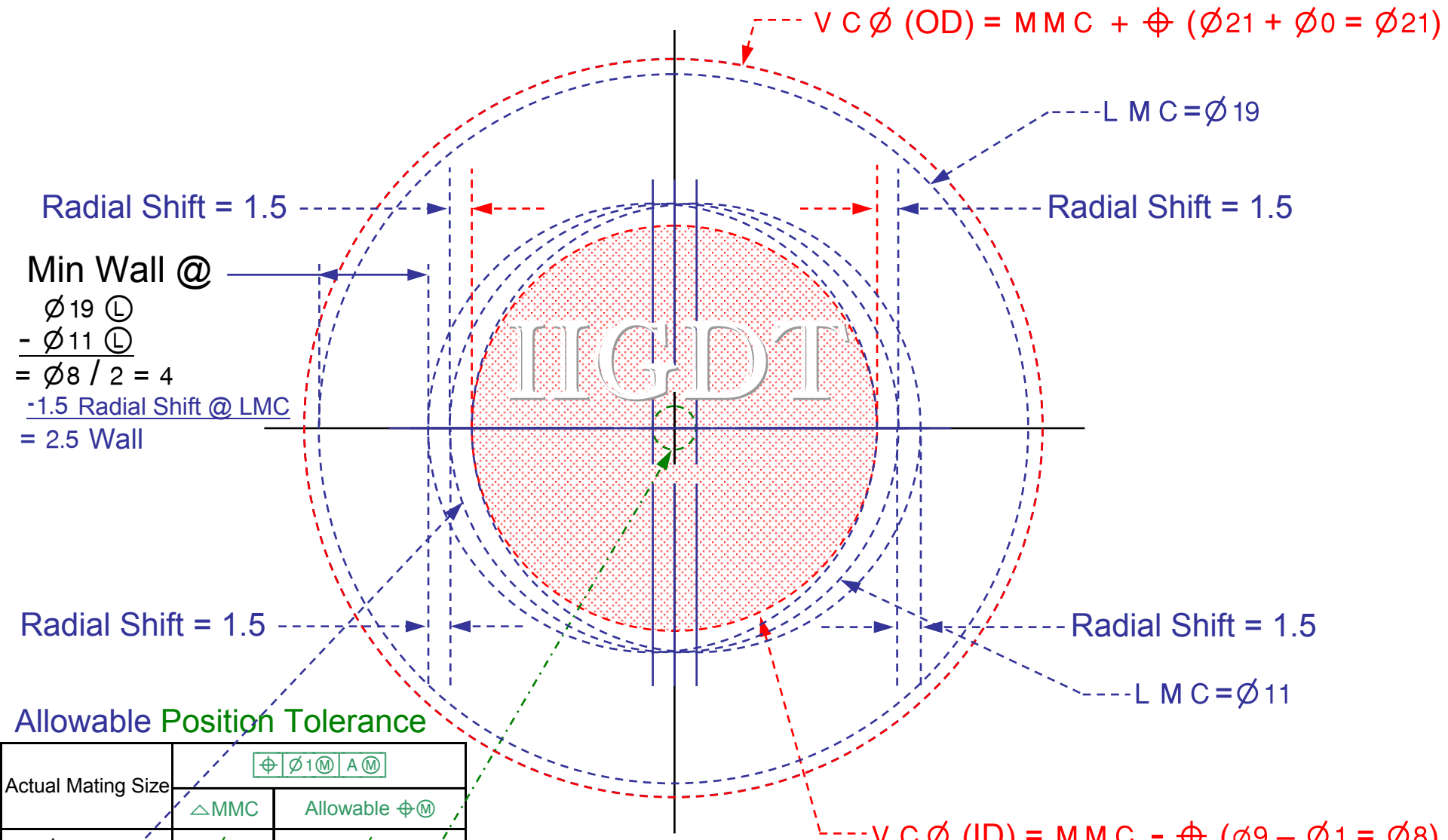
UGD1

Allowable Position Tolerance

Actual Mating Size	⌖ Ø1 Ⓜ A Ⓜ	
	△MMC	Allowable ⌖ Ⓜ
Ø9 (MMC)	Ø0	Ø1
Ø10 (Nominal)	Ø1	Ø2
Ø11 (LMC)	Ø2	Ø3

Washer Exercise

Min Wall based on variation in size at LMC & Position of ID (no shift caused by “A”)

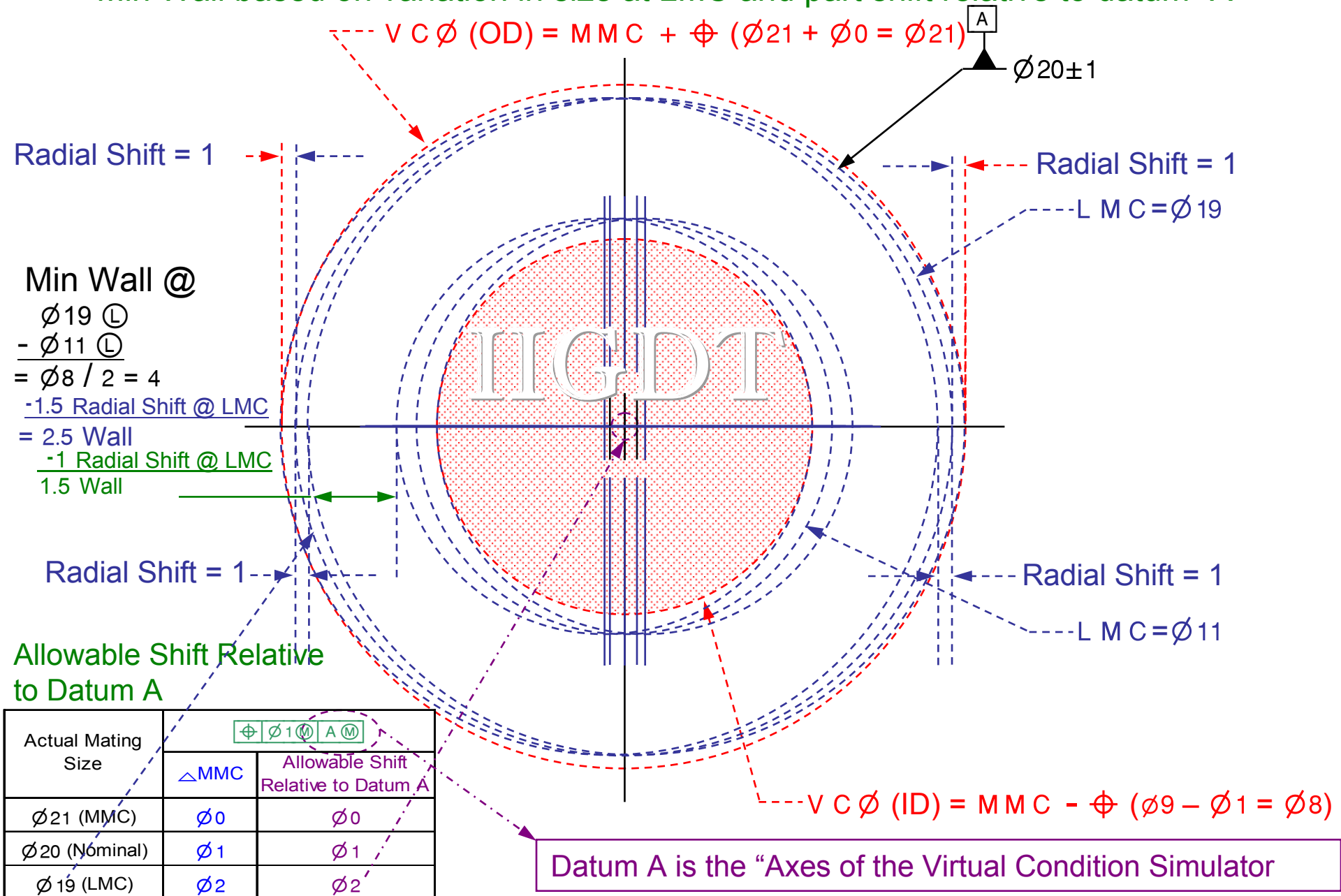


Allowable Position Tolerance

Actual Mating Size	⌖ Ø1Ⓜ A Ⓜ	
	△MMC	Allowable ⌖Ⓜ
Ø9 (MMC)	Ø0	Ø1
Ø10 (Nominal)	Ø1	Ø2
Ø11 (LMC)	Ø2	Ø3

Washer Exercise

Min Wall based on variation in size at LMC and part shift relative to datum “A”

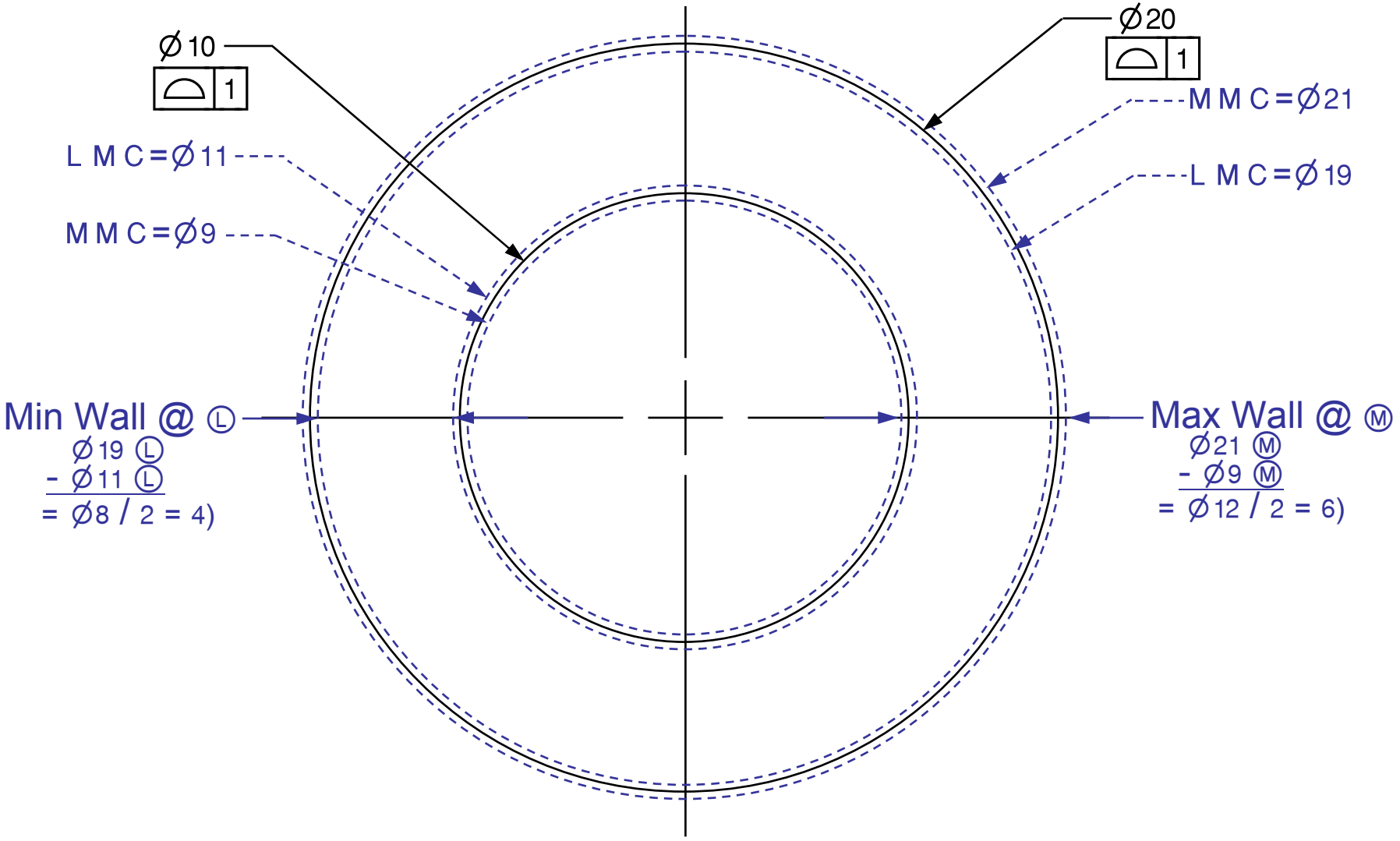


Allowable Shift Relative to Datum A

Actual Mating Size	⌖ Ø1 Ⓜ A Ⓜ	
	△MMC	Allowable Shift Relative to Datum A
Ø21 (MMC)	Ø0	Ø0
Ø20 (Nominal)	Ø1	Ø1
Ø19 (LMC)	Ø2	Ø2

Datum A is the “Axes of the Virtual Condition Simulator

Washer Exercise



Unless Otherwise Specified All Dimensions are BASIC and controlled Simultaneously