

TOL1



Tolerance Calculation and Tolerance Analysis

for Windows

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TOL1 : dim. elements

El.No	pred.el	+/-	nom.dim.	up.tol.	low.tol.	ISO tol.	Text	Info
1	16	+	3,000	0,100	-0,100		sw.button	
2	6	-	31,000	0,100	-0,100		tappet	
3	12	+	29,000	0,100	-0,100		case	
4	5	-	15,000	0,100	-0,100		case	
5	12	+	53,000	0,200	-0,200		case	
6	5	+	0,000	0,050	-0,050		tappet	
7	2	+	39,000	0,200	-0,200		tappet	
8	9	+	1,100	0,100	0,000		tappet	
9	2	+	3,000	0,100	-0,100		tappet	
10	16	-	16,000	0,100	-0,100		switch	
11	10	+	0,000	0,050	-0,050		cover	
12	0	-	21,000	0,100	-0,100		case	
13	11	-	5,000	0,000	-0,200		cover	
14	15	+	1,000	0,000	-0,060	h 11	ring	
15	9	+	0,000	0,050	-0,050		ring	
16	0	+	0,000	0,050	-0,050		switch	

closing dim.
1.: 0 ==> 2 switch-tappet

	class.method	statst.method.
max.dim.	1,450	1,250
min.dim.	0,550	0,750
tolerance	0,900	0,500

Calculate Sigma I Aux. Image Help Cancel OK

Export->Excel Import<-Excel standard dimension tolerance Angle

Tolerance Calculation and Tolerance Analysis

TOL1 software helps you to reduce both the time spent calculating dimension chains and the potential sources of errors to a minimum. In future, you create an element draft and a table table with all dimensions, tolerances, and dependancies. TOL1 then calculates the maximum and minimum dimensions between any desired distance within the dimension chain.

TOL1 Structure

In a table you define all dimension elements with predecessor element, nominal diameter, tolerances and direction. In a second table you define the critical distances (closing dimensions) to be calculated with minimum and maximum dimension.

Free Size Tolerances

TOL1 takes account of free size tolerances for general mechanical engineering in accordance with ISO 2768, for molded plastic parts in accordance with DIN 16742, for extruded parts in accordance with EN 12420 and for punched parts in accordance with DIN 6930.

ISO Tolerances

The program includes all ISO tolerances in accordance with ISO 286. If you enter H7 , for example, TOL1 will automatically take account of the upper and lower deviations in the calculation, according to the specified nominal dimension.

Closing Dimensions - Draft

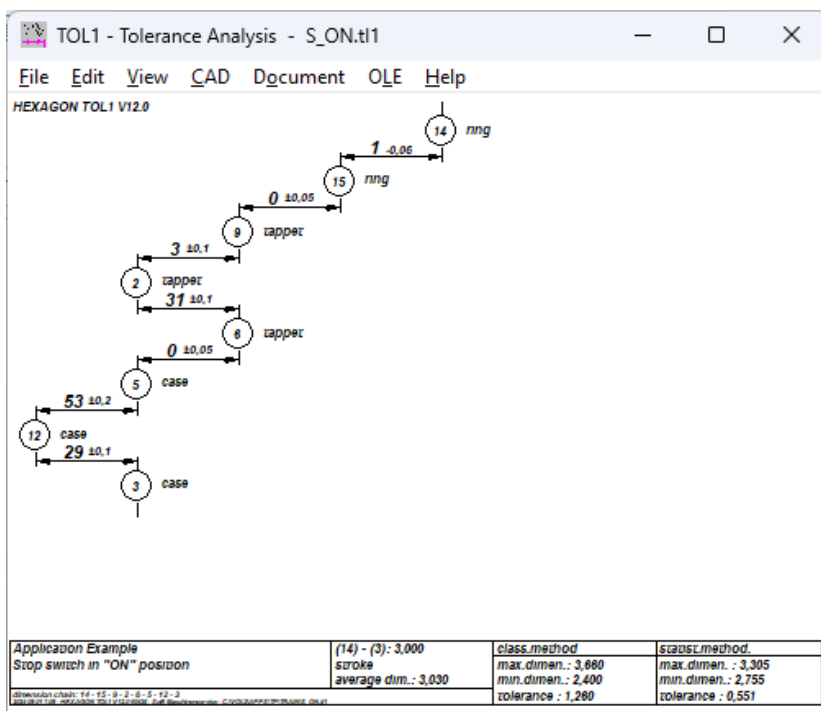
Overview about dimension chain of the closing dimension

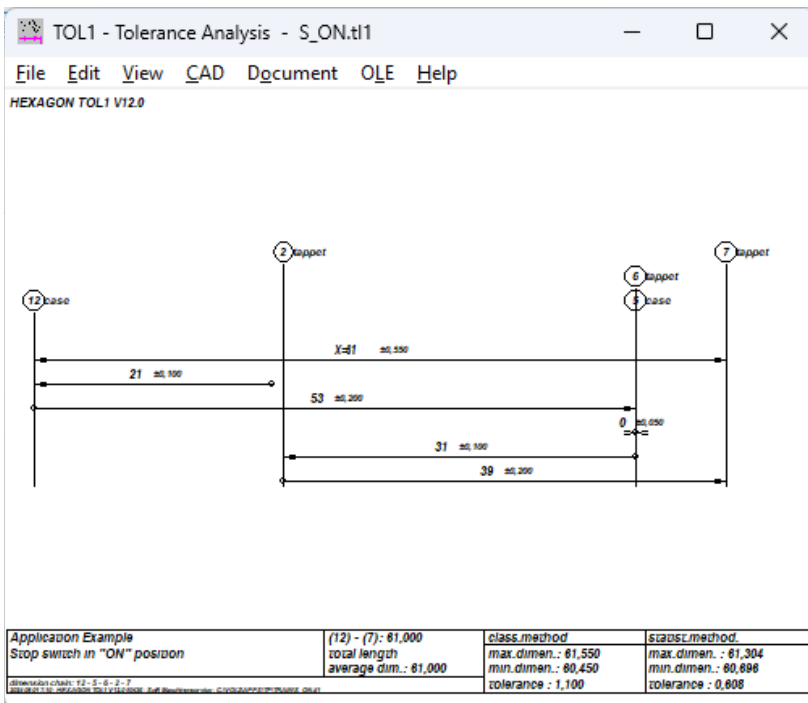
Closing Dimensions - Drawing

Scaled drawing with dimension elements of the closing chains defined by closing dimension.

Closing Dimensions - Printout

The text printout also lists the percentage share of the closing dimension tolerance for each dimension element.





Statistical distribution methods

The maximum and minimum dimensions in the dimension chain are calculated as the arithmetic sum (worst case), as well as from the square root of the tolerance squares (normal distribution). The statistical method, which is based on the normal distribution of all dimensions according to the bell-shaped Gaussian curve, is used above all for series-manufactured parts. The anticipated reject ratio can thus be estimated right from the design phase with the aid of the results of the statistical evaluation. You can display the dimension chain, which is made up of all the relevant elements, in the form of a graph on the screen. There is also a function for showing the distribution according to the bellshaped Gaussian curve for any desired distance.

Table Drawing

TOL1 generates a table drawing with input data of the dimension chain (element table) and result data (closing dimensions) with ISO 7200 drawing header.

MS Excel Import/Export

You can exchange your input data of the dimension chain directly with a worksheet of Microsoft Excel.

Text Printout

Input data and calculation results may be printed, saved as text or HTML file, or displayed on screen.

Graphic Printout

Drawings and diagrams can be printed on each Windows printer, or exported to CAD.

CAD Interface

All drawings and diagrams can be saved as DXF or IGES file to be loaded with CAD programs.

Units

TOL1 can be switched between metric units (mm, N, MPa) and imperial units (inch, lbf, psi).

Export Formats

DXF, IGES, HTML, TXT, TL1, Excel, TOL.

Import Formats

TXT, TOL, Excel, TL1.

System Requirements

TOL1 is available as 32-bit app or as 64-bit app for Windows 11, Windows 10, Windows 7.

Scope of Delivery

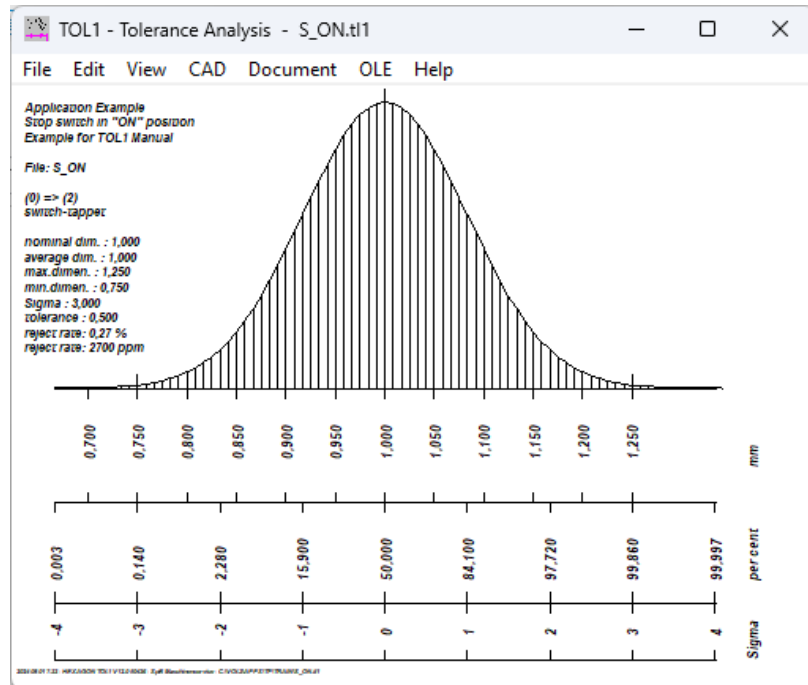
Program with user manual (pdf), example applications and help images, non-expiring license for unlimited time use with update rights.

Software Maintenance

HEXAGON Software is continuously improved and updated. Registered users are regularly kept informed of updates and new editions.

Guarantee

HEXAGON gives a 24 month guarantee on full functionality of the software. We provide help and support by email without extra charge.



Application Example
Stop switch in "ON" position

File: S_ON

dim. elements							
El.	Prod.	±	Nom.dim.	Up.Dev.	Low.Dev.	ISO	Text
1	16	+	3,000	0,300	-0,300		sw.button
2	6	-	31,000	0,100	-0,100		tappet
3	12	+	29,000	0,100	-0,100		case
4	5	-	15,000	0,100	-0,100		case
5	12	+	53,000	0,200	-0,200		case
6	5	+	0,000	0,050	-0,050		tappet
7	2	+	39,000	0,200	-0,200		tappet
8	9	+	1,100	0,100	0,000		tappet
9	2	+	3,000	0,100	-0,100		tappet
10	16	-	16,000	0,100	-0,100		switch
11	10	+	0,000	0,050	-0,050		cover
12	0	-	21,000	0,100	-0,100		case
13	11	-	5,000	0,000	-0,200		cover
14	15	+	1,000	0,000	-0,060	h11	ring
15	9	+	0,000	0,050	-0,050		ring
16	0	+	0,000	0,050	-0,050		switch

closing dim.							
Dis	tanc	aver.dim.	±	± (stat.)	Name	Limit	Reject
0	2	1,000	0,450	0,250	switch-tappet		
14	3	3,030	0,630	0,275	stroke		
13	12	-0,100	0,490	0,187	cover		
12	7	61,000	0,550	0,304	total length		
5	0	-32,000	0,300	0,224			