



Q-DAS Product Line

MMP groups

Creation and use in the software

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Document History

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CONTENTS

1 MMP groups.....3

1.1 Operation and accounting of the groups4

1.2 Creating the groups5

1.3 Detail of the calculation unit borehole7

1.3.1 Diameter and position in absolute centre of tolerance7

1.3.2 Diameter at the upper specification, position at 08

1.3.3 Diameter at lower specification, position at 0.....9

1.3.4 Diameter at the lower specification, positional tolerances at the upper limit 10

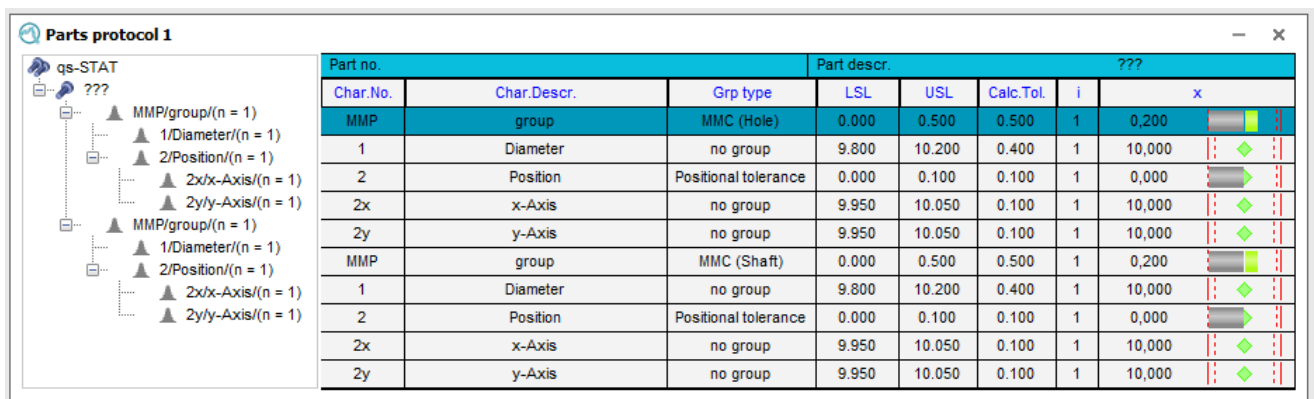
1 MMP groups

As a prerequisite for using this available option, the user must be aware of the basic use of the bonus in a maximum material condition.

The possibility offered by the Q-DAS software is to be checked by the operator for its suitability in the current environment. Q-DAS GmbH does not guarantee the correctness of the calculation of the MMP characteristics in the context of the customer.

A possibility for working with the MMP that has existed since version ME 4.0 are the MMP groups.

One-to-one relationships of a geometric characteristic and a form and position tolerance can be mapped. A superordinate group (Group type MMP bore or MMP shaft) calculates the common value for each pair of measured values and "normalises" the utilisation into a common tolerance.



Part no.			Part descr.					???
Char.No.	Char.Descr.	Grp type	LSL	USL	Calc.Tol.	i	x	
MMP	group	MMC (Hole)	0.000	0.500	0.500	1	0,200	
1	Diameter	no group	9.800	10.200	0.400	1	10,000	
2	Position	Positional tolerance	0.000	0.100	0.100	1	0,000	
2x	x-Axis	no group	9.950	10.050	0.100	1	10,000	
2y	y-Axis	no group	9.950	10.050	0.100	1	10,000	
MMP	group	MMC (Shaft)	0.000	0.500	0.500	1	0,200	
1	Diameter	no group	9.800	10.200	0.400	1	10,000	
2	Position	Positional tolerance	0.000	0.100	0.100	1	0,000	
2x	x-Axis	no group	9.950	10.050	0.100	1	10,000	
2y	y-Axis	no group	9.950	10.050	0.100	1	10,000	

The basic rule here is that the geometric characteristic must be within the tolerance.

This document deals with the topic of "joining ability" in a simplified way. Thus, this document does not provide any teaching material, but only explains the technical possibility.

1.1 Operation and accounting of the groups

In an MMP group, a characteristic with 2 normal specification limits and a characteristic with a natural boundaries at 0 is searched for directly below the group.

This identifies the geometric characteristic and the shape and position tolerance.

The tolerance width of the MMP group is calculated from the tolerance width of the geometric characteristic plus the tolerance width of the form and position tolerance. The lower specification limit is always 0 as a natural limit.

The calculation takes place according to the following formulas:

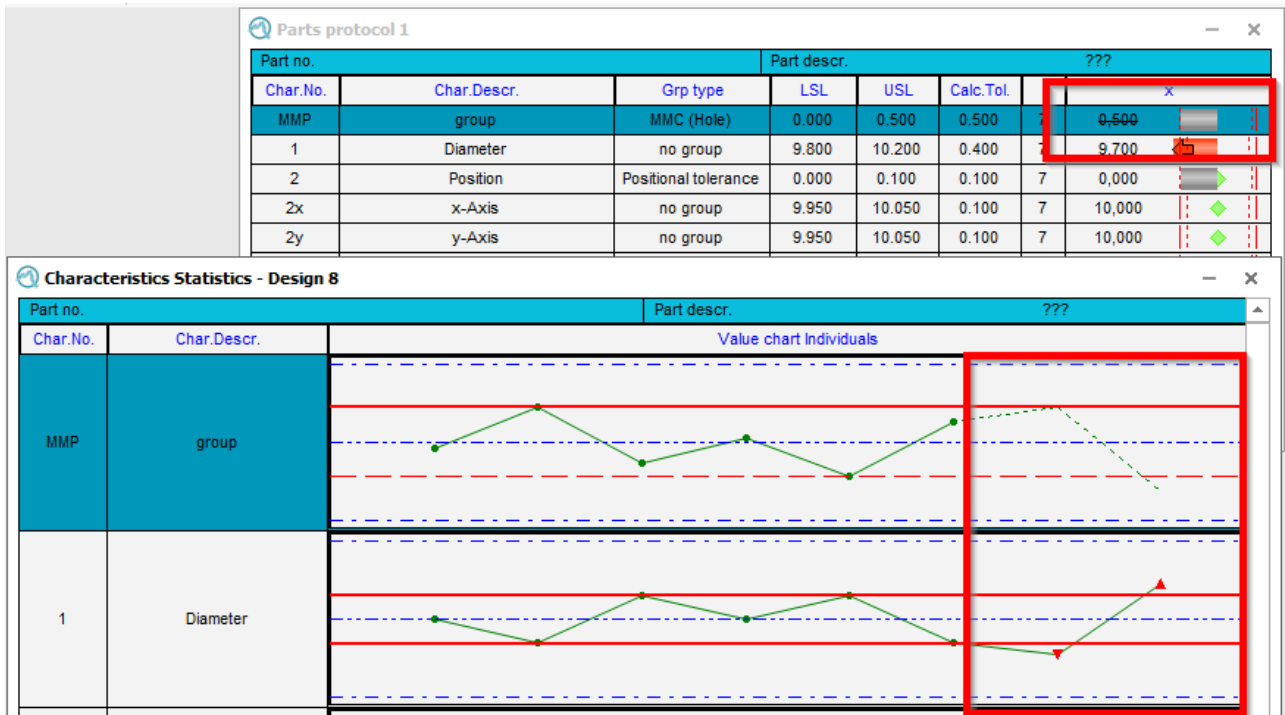
System Bore

$$MMP - Value = (USL_{geom.} - Value_{geom.}) + (Value_{Formtol.} - LSL_{Formtol.})$$

System shaft

$$MMP - Value = (Value_{geom.} - LSL_{geom.}) + (Value_{Formtol.} - LSL_{Formtol.})$$

The value in the MMP characteristic is only effectively output if the geometric characteristic was within the specification limits. In the last 2 measurements, the value of the geometric characteristic (diameter) was outside the specifications. Therefore the value is only shown crossed out, drawn dashed in the value chart.

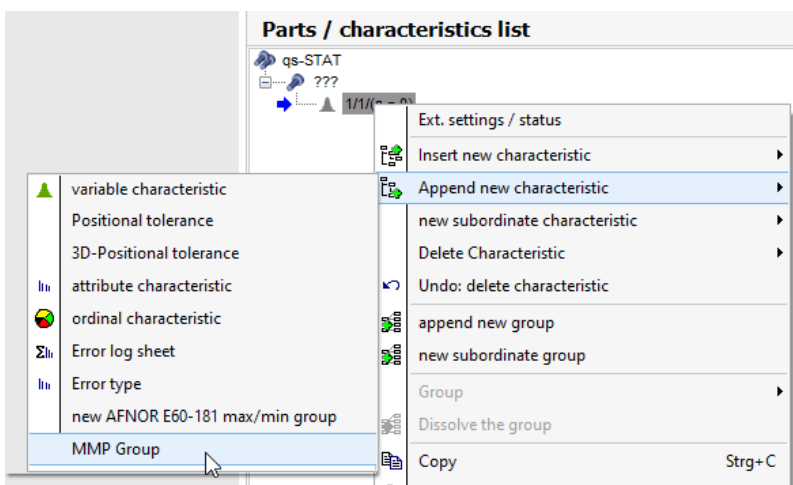


1.2 Creating the groups

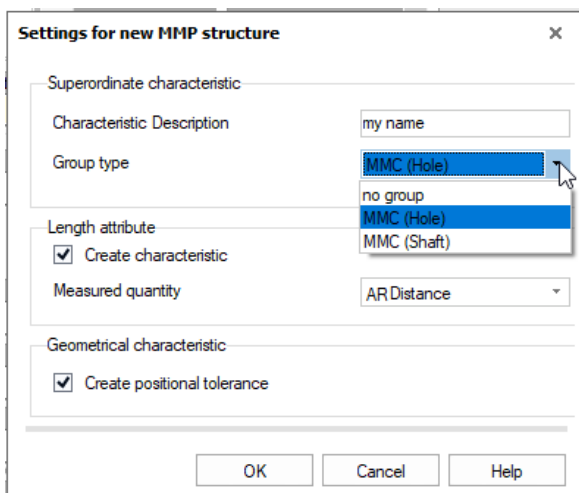
Theoretically, there is the possibility that the writing system could possibly generate these groups. In addition, there is the possibility in the Q-DM (upload) to have these groups generated. For this, the writing system must write the identification of which characteristics belong together in a K-field.

In addition to the possibility of having the writing system already create these groups, the following option exists in the software.

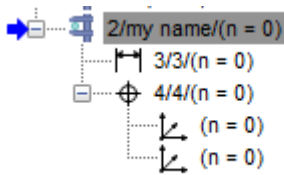
With an open data set, a new MMP group can be created / attached with the right mouse button in the parts characteristics list:



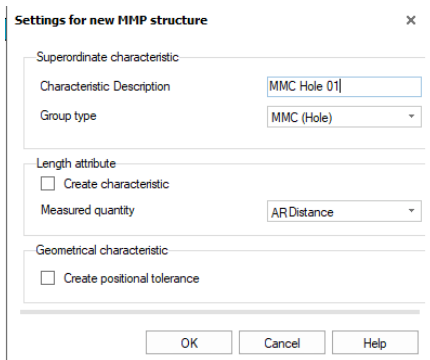
Then the following dialogue appears. In this dialogue you must first select whether the system is "bore" or "shaft". In addition, the geometrical characteristics and the positional tolerances can be created directly:



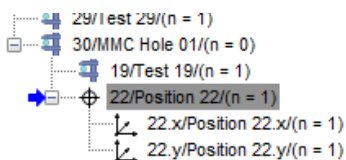
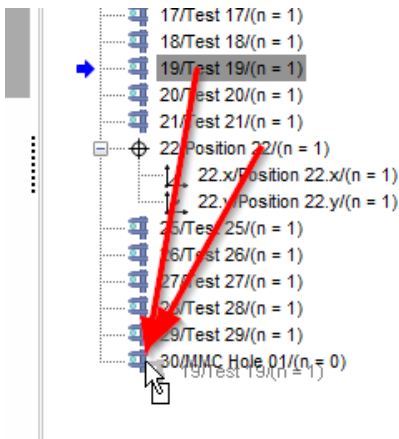
Then this structure is created:



Alternatively, for an existing data set, the MMP group can be created without sub-characteristics.



The desired characteristics can then be pushed under the group as sub-elements.



After reopening the data set, the specification limit and measured values of the MMP characteristics are calculated immediately.

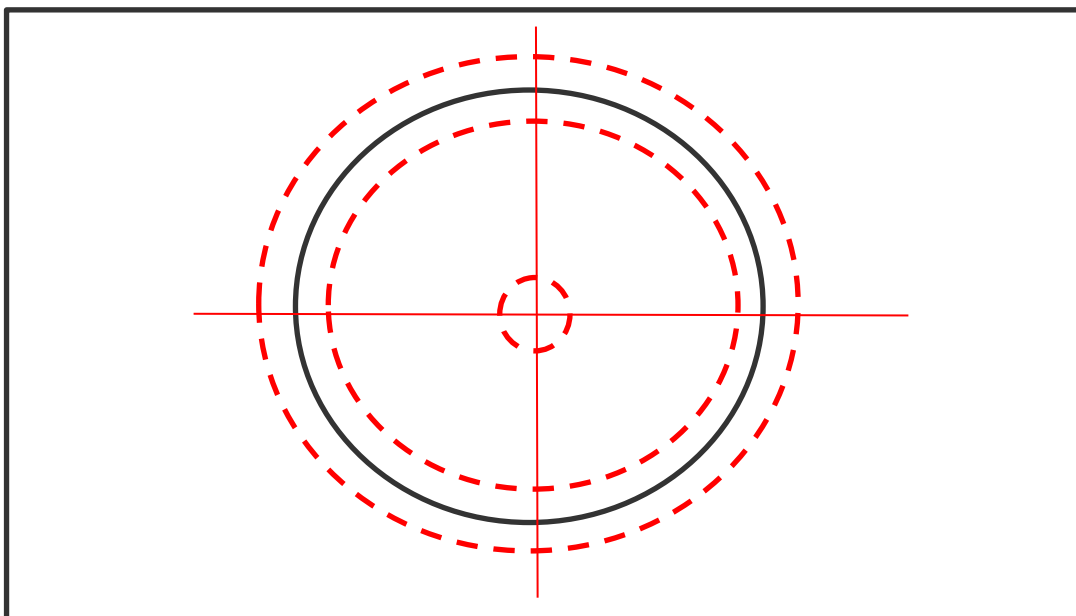


1.3 Detail of the calculation unit borehole

Here are some examples of calculation for understanding.

1.3.1 Diameter and position in absolute centre of tolerance

Part no.			Part descr.					???
Char.No.	Char.Descr.	Grp type	LSL	USL	Calc.Tol.	i	x	
MMP	group	MMC (Hole)	0.000	0.500	0.500	1	0.200	
1	Diameter	no group	9.800	10.200	0.400	1	10,000	
2	Position	Positional tolerance	0.000	0.100	0.100	1	0,000	
2x	x-Axis	no group	9.950	10.050	0.100	1	10,000	
2y	y-Axis	no group	9.950	10.050	0.100	1	10,000	

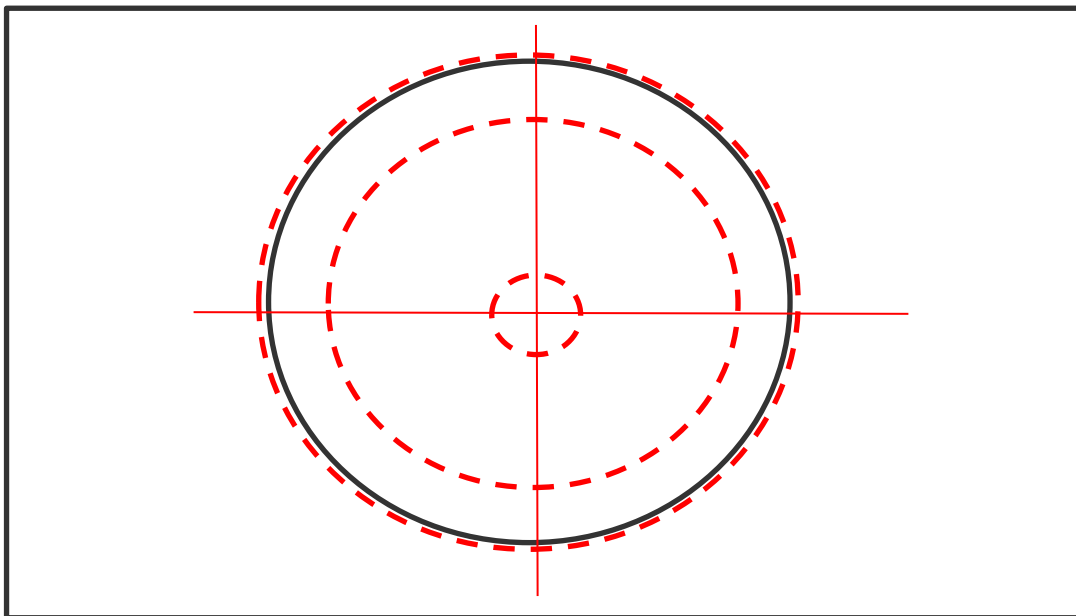


Explanation why the value of the MMP group is not 0 here: for maximum joining ability, the diameter of the hole could still be 0.2 larger.



1.3.2 Diameter at the upper specification, position at 0

Char.No.	Char.Descr.	Grp type	LSL	USL	Calc.Tol.	i	x
MMP	group	MMC (Hole)	0.000	0.500	0.500	5	0,000
1	Diameter	no group	9.800	10.200	0.400	5	10,200
2	Position	Positional tolerance	0.000	0.100	0.100	5	0,000
2x	x-Axis	no group	9.950	10.050	0.100	5	10,000
2y	y-Axis	no group	9.950	10.050	0.100	5	10,000

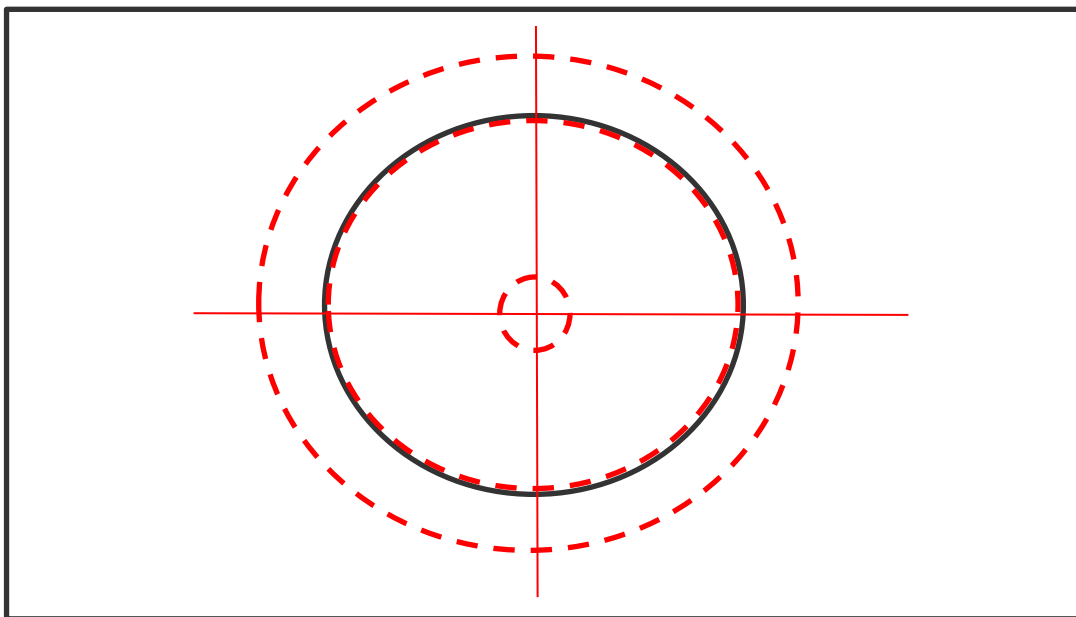


Explanation why the MMP value here is 0 at the natural boundaries: even more joining capacity is not possible. Any larger and the diameter of the hole would be outside the specification limit.



1.3.3 Diameter at lower specification, position at 0

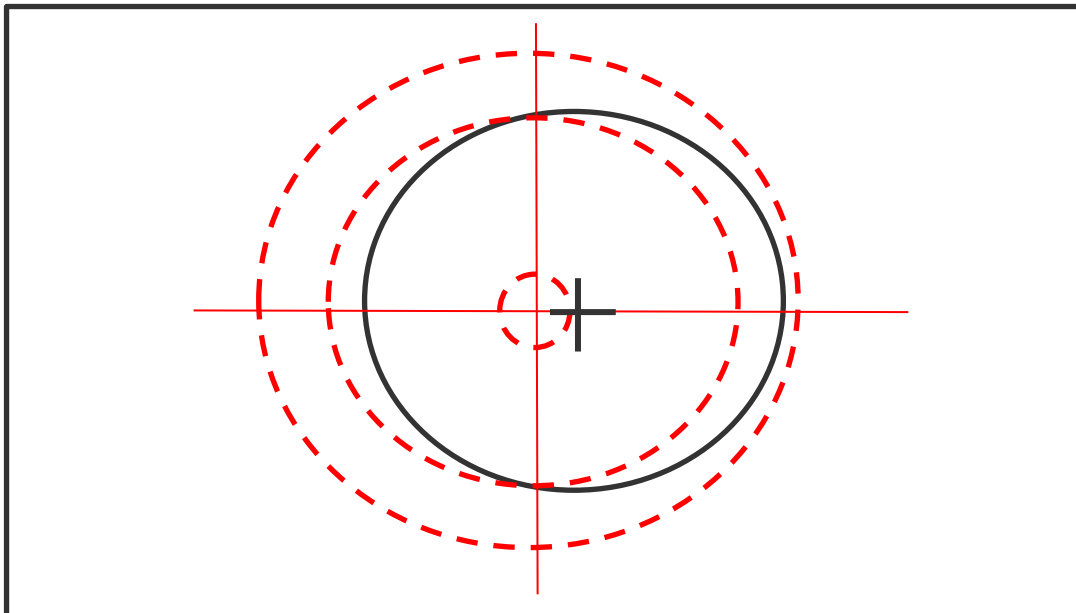
Part no.			Part descr.					???
Char.No.	Char.Descr.	Grp type	LSL	USL	Calc.Tol.	i	x	
MMP	group	MMC (Hole)	0.000	0.500	0.500	6	0,400	
1	Diameter	no group	9.800	10.200	0.400	6	9,800	
2	Position	Positional tolerance	0.000	0.100	0.100	6	0,000	
2x	x-Axis	no group	9.950	10.050	0.100	6	10,000	
2y	y-Axis	no group	9.950	10.050	0.100	6	10,000	





1.3.4 Diameter at the lower specification, positional tolerances at the upper limit

Part no.			Part descr.					???
Char.No.	Char.Descr.	Grp type	LSL	USL	Calc.Tol.	i	x	
MMP	group	MMC (Hole)	0.000	0.500	0.500	2	0,500	
1	Diameter	no group	9.800	10.200	0.400	2	9,800	
2	Position	Positional tolerance	0.000	0.100	0.100	2	0,100	
2x	x-Axis	no group	9.950	10.050	0.100	2	10,000	
2y	y-Axis	no group	9.950	10.050	0.100	2	9,950	



This would be the maximum utilisation of the MMP.