

Shoulder Bolts / Large Head Shoulder Screws

Configurable Dimensions / Tolerance g6, h7, e9

Shoulder Bolts – Dimension Selectable Shaft Dia. Tol. g6 / h7

Type	D Tolerance	Material	Hardness	Strength Class
GMSB	g6	4137 Alloy Steel	33-38 HRC min.	10.9
SGMSB		302 HQ Stainless Steel or Equivalent	—	A2-50
MSBH	h7	4137 Alloy Steel	33-38 HRC min.	10.9
SHMSB		302 HQ Stainless Steel or Equivalent	—	A2-50

D Tolerance		A	B	C	E	F	M x P	T	
D	g6	h7	6.5	2.5	1.6	3	5	2.5 x 0.45	4.5
4	-0.004	0	8	3	2	3.5	6	3 x 0.5	5.5
5	-0.012	-0.012	9	3	2	4	7	4 x 0.7	6.5
6	-0.005	0	13	5	3	6	9	6 x 1.0	8.7
8	-0.014	-0.015	16	6	4	8	12	8 x 1.25	10.8

Part Number Example: **GMSB10 - 50**

Type	D	L	F	M
GMSB	4	10 15 20 (25) (30)		
	5	10 15 20 (25) (30)		
SGMSB	6	10 15 20 25 30 35 40		
	8	10 15 20 25 30 35 40 45		
MSBH	10	10 15 20 25 30 35 40 45 50 55 60		
	10	10 15 20 25 30 35 40 45 50 55 60		

Type	D	L
MSBH	4	10 15 20
	5	10 15 20
SHMSB	6	10 15 20 25
	8	10 15 20 25 30
MSBH	10	10 15 20 25 30 35
	10	10 15 20 25 30 35

MSBH is not available for D4. SHMSB is not available for D10.

Part Number Example: **GMSB10 - 50**

Shoulder Bolts – Configurable Type Shaft Dia. Tol. g6 / h7

Type	D Tol.	Material	Hardness	Strength Class
GDMSB	g6	4137 Alloy Steel	33-38 HRC min.	10.9
GDSMSB		304 Stainless Steel or Equivalent	—	A2-50
HDMSB	h7	4137 Alloy Steel	33-38 HRC min.	10.9
HDSMSB		304 Stainless Steel or Equivalent	—	A2-50

D Tolerance		A	B	C	E	T	L+F Machining Conditions	
D	g6	h7	7	2.5	1.6	3	4.5	L+F≤46
4.5	-0.004	0	9	3	2	3.5	5.5	L+F≤47
5.5	-0.012	-0.012	10	3	2	4	6.5	L+F≤59
6	-0.005	0	13	5	3	6	8.7	L+F≤70
6.5	-0.005	0	16	6	4	8	10.8	L+F≤72

*M=D has no groove and F is the effective thread.

When M=D: $L+F \pm 0.05$

*When M=D, there is not undercut. Note that full thread length will be min of F. There will be a Thread run-out of 1-2 turns past F.

Type	D	L		M
		0.1 mm Increment	0.5 mm Increment	
GDMSB	4	10-40	3-9	4
	4.5	10-40	3-9	4
GDSMSB	5	10-40	4-12	4
	5.5	10-40	4-12	3
HDMSB	6	10-50	5-15	6
	6.5	10-50	5-15	6
HDSMSB	8	10-60	6-18	8
	10	10-60	8-24	10

Part Number Example: **HDSMSB6.5 - 30 - F12 - M5**

Large Head Shoulder Screws – Shaft Dia. Tol. e9

MSBY

Material: 1045 Carbon Steel or Equivalent
Hardness: 40 HRC min.
Surface Treatment: Knurled Head: Black Oxide

Type	D _{e9}	L Selection	M x P	A	E	F
MSBY	6	15 20	4 x 0.7	24	7	7
	8	25 30 35 40	6 x 1.0	30	8	9
	10	25 30 35 40	8 x 1.25	36	10	12

It can be tightened by hand since A dimension is larger than that of MSB.

Part Number Example: **MSBY6 - 20**

Low Head Shoulder Screws

Shaft Diameter Tolerance g6, h7 & e9 / Configurable Dimensions

Low Head Shoulder Screws – Shaft Dia. Tol. g6 / h7 / e9

Type	D Tolerance	Material	Hardness	Strength Class
LMSB	e9	4137 Alloy Steel	28-37 HRC min.	9.8 Equivalent
LSMSB		304 Stainless Steel or Equivalent	—	A2-50
LMSBG	g6	4137 Alloy Steel	28-37 HRC min.	9.8 Equivalent
LSMSBG		304 Stainless Steel or Equivalent	—	A2-50
LMSBH	h7	4137 Alloy Steel	28-37 HRC min.	9.8 Equivalent
LSMSBH		304 Stainless Steel or Equivalent	—	A2-50

D Tolerance		A	B	C	E	F	M x P	T		
D	e9	g6	h7	6.5	2.5	1.6	2	5	2.5 x 0.45	4.5
4.5	-0.020	-0.004	0	7	3	2	2	6	3 x 0.5	5.0
5	-0.050	-0.012	-0.012	8	3	2	2.5	6	3 x 0.5	5.5
5.5	-0.050	-0.012	-0.012	9	3	2.2	2.5	6	4 x 0.7	6.0
6	-0.025	-0.005	0	10	4	2.5	3	9	5 x 0.8	7.0
6.5	-0.061	-0.014	-0.015	13	5	3	4	9	6 x 1.0	8.7
8	-0.061	-0.014	-0.015	16	6	4	5	12	8 x 1.25	10.8

Selectable L-Dimension

Type	D	L
LMSB	4	*10 *15 *20
	4.5	*10 *15 *20 25 30 35 40
LSMSB	5	*10 *15 *20 *25 30 35 40
	5.5	*10 *15 *20 *25 30 35 40
LMSBG	6	*10 *15 *20 *25 30 35 40
	6.5	*10 *15 *20 *25 30 35 40
LMSBH	8	*10 *15 *20 *25 30 35 40
	10	*10 *15 *20 *25 30 35 40

(Both g6 and h7 tolerance are applicable only to sizes marked with *)

g6 and h7 tolerance is only applicable to sizes marked with *

Part Number Example: **LSMSB6.5 - 30**

Low Head Shoulder Screws – Shaft Dia. Tol. g6 / h7 / e9

Type	D Tolerance	Material	Hardness	Strength Class
FMSB	e9	4137 Alloy Steel	28-37HRC min.	9.8 Equivalent
FSMSB		302 HQ Stainless Steel	—	A2-50
FMSBG	g6	4137 Alloy Steel	28-37HRC min.	9.8 Equivalent
FSMSBG		302 HQ Stainless Steel	—	A2-50
FMSBH	h7	4137 Alloy Steel	28-37HRC min.	9.8 Equivalent
FSMSBH		302 HQ Stainless Steel	—	A2-50

D Tolerance		A	B	C	E	M x P	T			
D	e9	g6	h7	6.5	2.5	1.6	2	5	2.5 x 0.45	4.5
4.5	-0.020	-0.004	0	7	3	2	2	6	3 x 0.5	5.0
5	-0.050	-0.012	-0.012	8	3	2	2.5	6	3 x 0.5	5.5
5.5	-0.050	-0.012	-0.012	9	3	2.2	2.5	6	4 x 0.7	6.0
6	-0.025	-0.005	0	10	4	2.5	3	9	5 x 0.8	7.0
6.5	-0.061	-0.014	-0.015	13	5	3	4	9	6 x 1.0	8.7
8	-0.061	-0.014	-0.015	16	6	4	5	12	8 x 1.25	10.8

Configurable L and F Dimensions

Type	D	L	F	L+F Machining Conditions
FMSB	4	10-40		L+F≤45
	4.5	10-40		L+F≤46
FSMSB	5	10-40		L+F≤46
	5.5	10-40		L+F≤47
FMSBG	6	10-40		L+F≤47
	6.5	10-50		L+F≤59
FMSBH	8	10-60		L+F≤70
	10	10-60		L+F≤72

$M \leq F \leq M \times 3$

Part Number Example: **FMSB4.5 - 30.5 - 4**