



PRODUCT CATALOGUE

# Fastening Solutions



주식회사 심 일  
[www.sifastener.com](http://www.sifastener.com)



당사는 1998년 창업 이래 Blind Rivet 및 BOLT 등 FASTENER 전문업체로 성장을 하고 있습니다.

자동차, 컨테이너, 가전제품, 건설 등 광범위하게 사용되는 다양한 체결요소 부품을 생산 공급하고 있으며 국내는 물론 세계 여러 나라에서 그 우수성을 인정 받고 있습니다.

투철한 장인정신으로 최고의 품질, 저렴한 가격, 적기공급을 위하여 꾸준한 연구개발과 품질관리로 더욱더 정진함은 물론 고객이 만족하고 신뢰할 수 있는 제품을 생산하는 세계적 일류기업으로 성장하고자 부단한 노력을 다 할 것입니다.  
감사합니다.

(주)삼일 대표이사

정 용 일

We, SAMIL has professionally manufactured blind rivets, bolts and fasteners since the foundation in 1998.

We have produced wide spread coupling devices used for cars, containers, electric appliances and constructions to various customers.

We are the respected company not only in local market but also

international one for the craftsmanship, the best quality with reasonable prices, opportune deliveries.

We keep investing our steady efforts in giving satisfaction to our customers with better quality and services.

We will always do our best to be the global leading company our customers can trust and be in perfect content.

Thank you

SAMIL CEO'S

Jung Yong il





## History

Incorporated in June. 1998  
 Selected as the venture business as small and medium size enterprise in Oct. 1998  
 Development of SAMBOLT in March. 1999  
 Selected as the bright prospect of the exportation in May. 1999  
 The acquisition of ISO 9000 in Oct. 2000  
 The acquisition of QS-9000 in Nov. 2002  
 Applied for a special Nutsert patent in Apr. 2004  
 Head office Completed and moved in Aug. 2005  
 The acquisition of ISO/TS 16949 in May. 2006  
 Certified Management Innovation Business Company in Dec. 2006  
 Awarded "The Tower of 1 million dollars Export Achievement" in Dec. 2007  
 Increased of the second factory in sihwa industrial complex in Oct. 2008  
 Applied for riveting machine patent in Sep. 2009  
 Increased Equipment for construction parts in Oct. 2010  
 The acquisition of KS B in Sep. 2011  
 Expansion of head office and moved in Oct. 2011  
 Establish R&D center in Apr. 2013  
 The acquisition of ISO/TS16949:2009 in May. 2013  
 Development of POP-NUT in Jan. 2014

## Main Products

HEXAGON NUTS  
 HEXAGON BOLTS  
 WELDING STUD BOLTS  
 CUP HEAD SQUARE NECK BOLTS  
 HIGH STRENGTH HEX BOLTS, NUTS, WASHERS  
 FOUNDATION BOLTS(ANCHOR BOLTS)  
 STUD BOLTS  
 SET ANCHORS  
 BLIND RIVETS  
 LOCK BOLTS  
 SOLID RIVETS  
 BOLTS, SCREWS  
 SPECIAL FASTENERS

## 회사연혁

1998. 06 (주)삼일 법인설립  
 1998. 10 신기술 벤처기업 선정  
 1999. 03 SAMBOLT 개발  
 1999. 05 수출유망 중소기업 선정  
 2000. 10 ISO 9000 인증서 획득  
 2002. 11 QS-9000 인증서 획득  
 2004. 04 실용신안 특허 출원  
 2005. 08 본사 이전(시화공단)  
 2006. 05 ISO/TS-16949 인증 획득  
 2006. 12 INNO-BIZ 기업 선정  
 2007. 12 100만불 수출탑 수상  
 2008. 10 제 2공장 증설  
 2009. 09 브라인드리벳 제조장치 특허 출원  
 2010. 10 건설 관련 부품 생산 및 장비 증설  
 2011. 09 KS B표시 인증 획득  
 2011. 10 본사 확장 이전  
 2013. 04 기업부설 연구소 설립  
 2013. 05 ISO/TS16949:2009 인증 획득  
 2014. 01 POP-NUT 개발 생산

## 주 생산품

HEXAGON NUTS  
 HEXAGON BOLTS  
 WELDING STUD BOLTS  
 CUP HEAD SQUARE NECK BOLTS  
 HIGH STRENGTH HEX BOLTS, NUTS, WASHERS  
 FOUNDATION BOLTS(ANCHOR BOLTS)  
 STUD BOLTS  
 SET ANCHORS  
 BLIND RIVETS  
 LOCK BOLTS  
 SOLID RIVETS  
 BOLT,SCREWS  
 SPECIAL FASTENERS

# EXPANDING HS RIVET

Multi-grip structural breakstem fasteners providing a fully sealed joint and visible lock

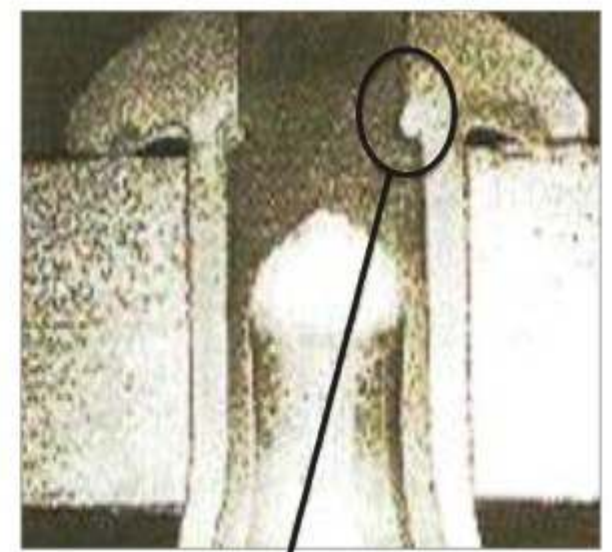
## SPECIFICATIONS

- Sizes : 4.8mm(3/16"), 6.4mm(1/4"), 9.5mm(3/8")
- Materials : Alumium alloy, steel and stainless steel
- Headforms : Protruding and countersunk



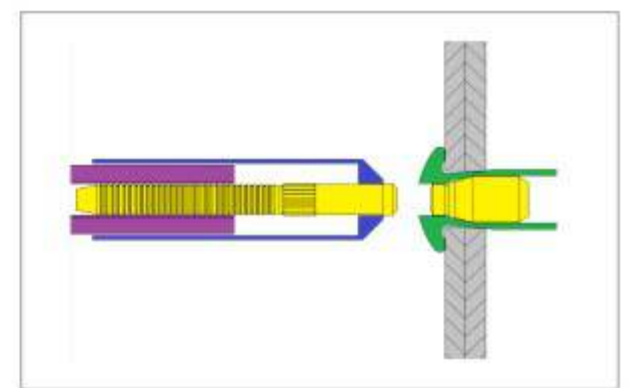
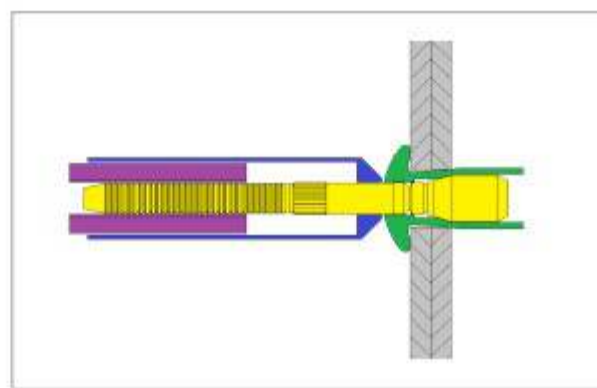
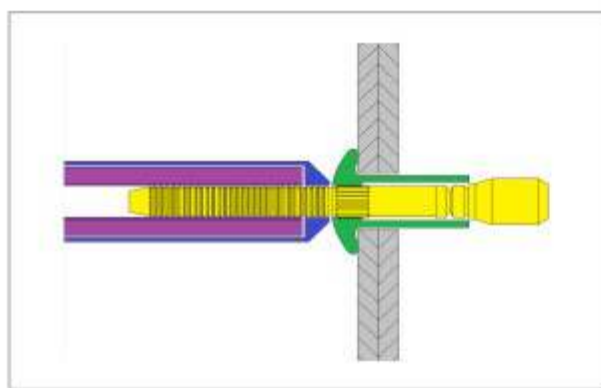
## FEATURES

- Multi-grip capability
- A fully sealed fastener
- Visible lock
- Excellent hole full via radially expanded body
- Stem mechanically locked into body
- Good sheet take-up performance



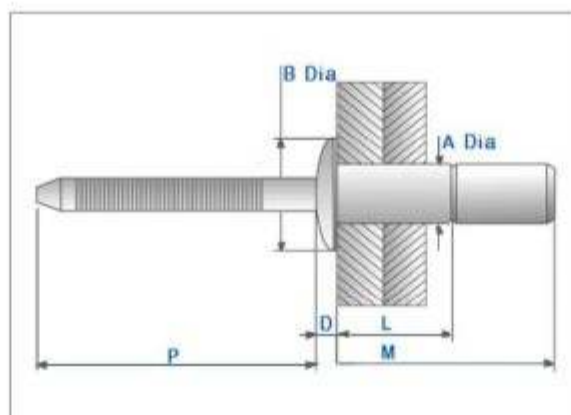
Positive Mechanical Lock

## TYPICAL PLACING SEQUENCE





# EXPANDING HS RIVET



Before Placing



After Placing

## PROTRUDING HEAD

Dimensions in millimetres

Size	Part Number			Grip Range	Recommended Hole Size	A nom	B max	D max	L max	M max	P min
	Aluminum	Stainless steel	Carbon steel								
4.8mm (3/16")	75A-0613	33S-0613	44S-0613	1.6~6.9	4.9~5.1	4.8	10.1	2.2	10.6	18.2	25.4
	75A-0617	33S-0617	44S-0617	1.6~11.1					14.6	24.6	
6.4mm (1/4")	75A-0817	33S-0817	44S-0817	2.0~9.5	6.6~6.9	6.4	13.4	3.0	14.3	25.3	25.4
	75A-0824	33S-0824	44S-0824	2.0~15.9					20.6	35.6	
9.5mm (3/8")	75A-1212	33S-1212	44S-1212	3.0~14.2	10.0~10.40	9.8	20.0	4.5	21.4	42.0	39.30

## PERFORMANCE DATA(1kgf ≒ 9.8N)

Material	Size(mm)	Shear Strength(KN)	Tension Strength(KN)
Aluminum	4.8	2.7	2.2
	6.4	5.8	4.0
	9.5	13.1	8.5
Stainless Steel	4.8	5.8	4.2
	6.4	10.5	8.0
	9.5	22.2	17.8
Carbon Steel	4.8	5.8	5.3
	6.4	11.1	9.8
	9.5	24.9	17.7

## MATERIAL AND FINISH

	Material		Finish	
	Body	Mandrel	Body	Mandrel
Aluminum	Aluminum Alloy 5056A	Aluminum Alloy 7075A	Polished	Polished
Stainless Steel	Stainless Steel SUS 302	Stainless Steel SUS 304	Polished	Natural
Carbon Steel	Low Carbon Steel	Medium Carbon Steel	Zinc Plated	Zinc Plated and Passivated

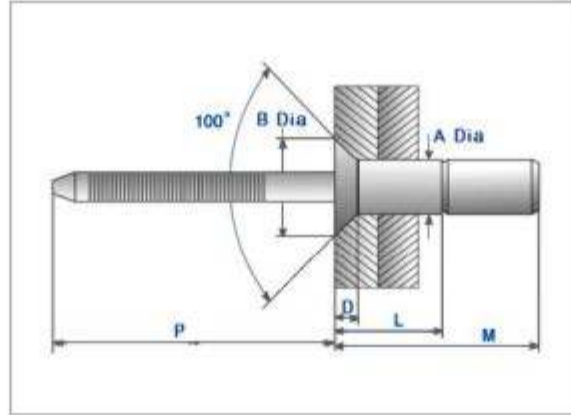
# EXPANDING HS RIVET

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EXPANDING  
HS RIVET

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page



Before Placing



After Placing

## 100° COUNTER SUNK HEAD

Dimensions in millimetres

Size	Part Number			Grip Range	Recommended Hole Size	A nom	B max	D max	L max	M max	P min
	Aluminum	Stainless steel	Carbon steel								
4.8mm (3/16")	75AC-0614	33SC-0614	44SC-0614	3.2~8.4	4.9~5.1	4.8	8.8	2.0	13	20	25.4
	75AC-0618	33SC-0618	44SC-0618	7.7~12.7					17	28	
6.4mm (1/4")	75AC-0818	33SC-0818	44SC-0818	4.1~12.1	6.6~6.9	6.4	10.4	2.2	17	27	25.4
	75AC-0826	33SC-0826	44SC-0826	10.5~18.4					23.5	37	
9.5mm (3/8")	75AC-1212	33SC-1212	44SC-1212	6.0~19.0	10.0~10.40	9.8	16.0	3.3	25.9	42.4	25.4

## PERFORMANCE DATA(1kgf ≒ 9.8N)

Material	Size(mm)	Shear Strength(KN)	Tension Strength(KN)
Aluminum	4.8	2.7	2.2
	6.4	5.8	4.0
	9.5	13.1	8.5
Stainless Steel	4.8	5.8	4.2
	6.4	10.5	8.0
	9.5	22.2	17.8
Carbon Steel	4.8	5.8	5.3
	6.4	11.1	9.8
	9.5	24.9	17.7

## MATERIAL AND FINISH

	Material		Finish	
	Body	Mandrel	Body	Mandrel
Aluminum	Aluminum Alloy 5056A	Aluminum Alloy 7075A	Polished	Polished
Stainless Steel	Stainless Steel SUS 302	Stainless Steel SUS 304	Polished	Natural
Carbon Steel	Low Carbon Steel	Medium Carbon Steel	Zinc Plated	Zinc Plated and Passivated



# BULBING BLIND RIVET

High strength stainless steel breakstem fasteners with excellent bulbing tail formation, Ideal for thin sheet materials.

## SPECIFICATIONS

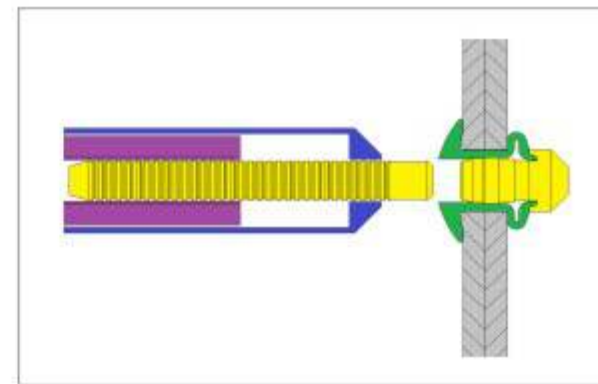
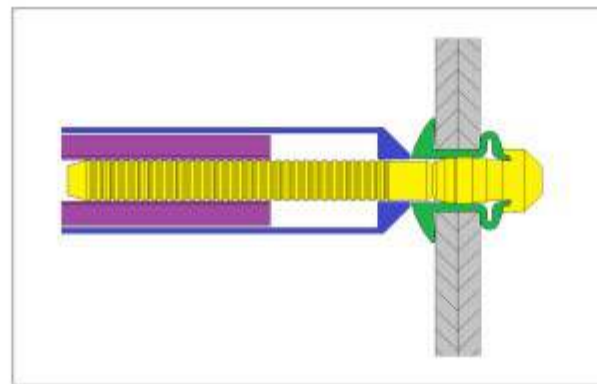
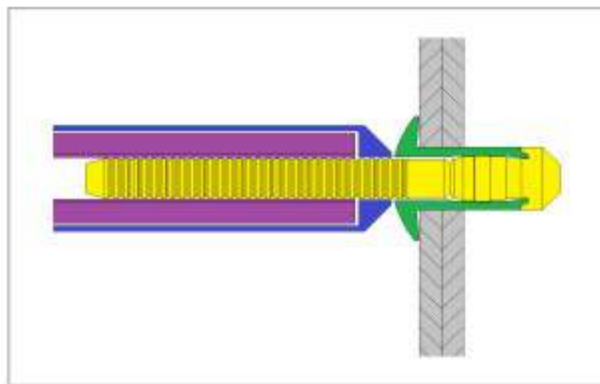
- Sizes : 3.2mm(1/8"), 4.0mm(5/32"), 4.8mm(3/16")
- Material : Stainless Steel
- Headform : Dome Head



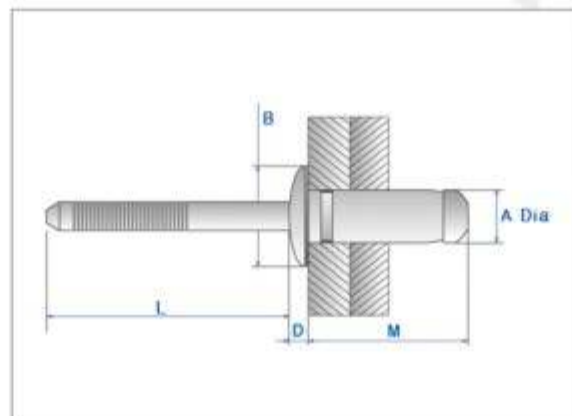
## FEATURES

- Good hole fill
- Retained stem
- Large blind side bearing area against the rear sheet
- Wide choice of installation tools

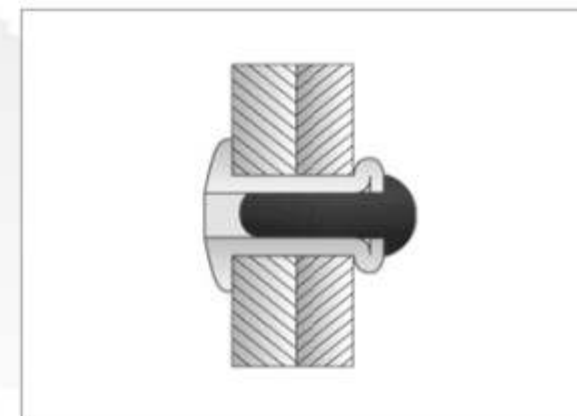
## TYPICAL PLACING SEQUENCE



# BULBING BLIND RIVET



Before Placing



After Placing

## DEMENSIONS & PERFORMANCE DATA

Dimensions in millimetres

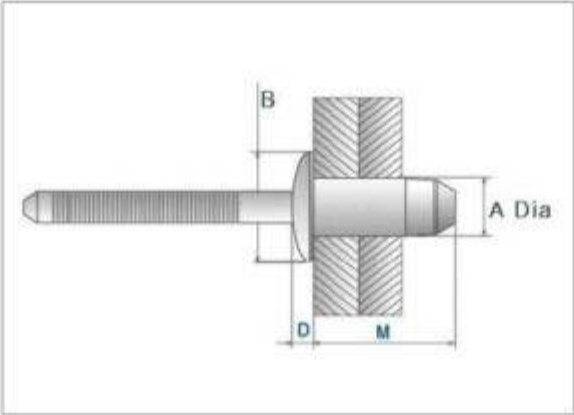
Size	Part Number	Grip Range	Recommended Hole Size	B max	C max	D max	M max	(Typical Values)	
								Shear KN	Tension KN
3.2 (1/8")	B33-0408	1.0~3.0	3.3~3.4	6.6	2.1	1.1	8.9	1.6	2.0
	B33-0411	3.0~5.0		6.6	2.1	1.1	11.4	1.7	2.0
	B33-0414	5.0~7.0		6.6	2.1	1.1	13.6	3.2	2.0
4.0 (5/32")	B33-0509	1.0~3.0	4.1~4.3	8.0	2.6	1.5	10.1	5.2	4.0
	B33-0512	3.0~5.0		8.0	2.6	1.5	12.5	5.2	4.0
	B33-0516	5.0~7.0		8.0	2.6	1.5	15.1	5.2	4.0
4.8 (3/16")	B33-0611	1.5~3.5	4.9~5.1	9.6	3.2	1.5	12.9	5.5	5.0
	B33-0614	3.5~6.0		9.6	3.2	1.5	15.5	5.5	5.0
	B33-0618	6.0~8.5		9.6	3.2	1.5	18.5	5.5	5.0

## MATERIAL AND FINISH

	Material		Finish	
	Body	Mandrel	Body	Mandrel
Stainless Steel	Stainless Steel SUS 302	Stainless Steel SUS 321	Polished	Natural



# BULBING HS RIVET



Before Placing



After Placing

## DEMENSIONS & PERFORMANCE DATA

Dimensions in millimetres

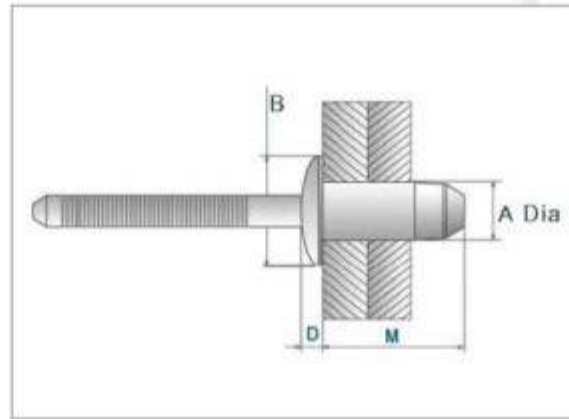
Size	Part Number	Grip Range	Recommended Hole Size	A	B max	D max	M max	(Typical Values)	
								Shear KN	Tension KN
6.4 (1/4")	H44A-0812	1.5~3.5	6.7~6.9	6.4	13.4	2.6	13.7	5.0	2.7
	H44A-0813	2.8~4.8					15.0	6.0	2.7
	H44A-0814	3.3~5.4					15.6	6.0	2.7
	H44A-0815	4.8~6.8					17.0	6.5	2.7
	H44A-0817	6.8~8.8					19.0	7.0	2.7
	H44A-0819	8.8~10.8					21.0	7.0	2.7
	H44A-0820	9.8~11.8					22.0	7.0	2.7
	H44A-0821	10.8~12.8					23.0	7.0	2.7
	H44A-0823	12.8~14.8					25.0	7.0	2.7

## MATERIAL AND FINISH

	Material		Finish	
	Body	Mandrel	Body	Mandrel
Aluminum	Aluminum Alloy 5056A	Aluminum Alloy 7075A	Natural	Natural



# BULBING HS RIVET



Before Placing



After Placing

## DEMENSIONS & PERFORMANCE DATA

Dimensions in millimetres

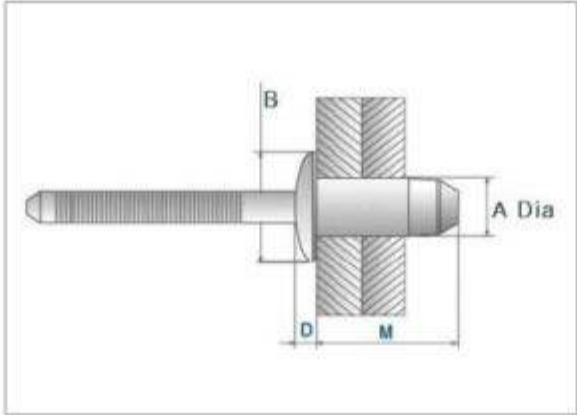
Size	Part Number	Grip Range	Recommended Hole Size	A	B max	D max	M max	(Typical Values)	
								Shear KN	Tension KN
6.4 (1/4")	H44S-0812	1.5~3.5	6.7~6.9	6.4	13.4	2.6	13.7	10.5	8.8
	H44S-0813	2.8~4.8					15.0	12.0	8.8
	H44S-0814	3.3~5.4					15.6	12.5	8.8
	H44S-0815	4.8~6.8					17.0	12.5	8.8
	H44S-0817	6.8~8.8					19.0	14.0	8.8
	H44S-0819	8.8~10.8					21.0	16.0	8.8
	H44S-0820	9.8~11.8					22.0	16.0	8.8
	H44S-0821	10.8~12.8					23.0	16.0	8.8
	H44S-0823	12.8~14.8					25.0	16.0	8.8

## MATERIAL AND FINISH

	Material		Finish	
	Body	Mandrel	Body	Mandrel
Carbon Steel	Medium Carbon Steel	Medium Carbon Steel	Zinc Plated and Passivated	Zinc Plated and Passivated



# BULBING HS RIVET



Before Placing



After Placing

## DEMENSIONS & PERFORMANCE DATA

Dimensions in millimetres

Size	Part Number	Grip Range	Recommended Hole Size	A	B max	D max	M max	(Typical Values)	
								Shear KN	Tension KN
6.4 (1/4")	H44S/S-0812	1.5~3.5	6.7~6.9	6.4	13.4	2.6	13.7	10.5	8.8
	H44S/S-0813	2.8~4.8					15.0	12.0	8.8
	H44S/S-0814	3.3~5.4					15.6	12.5	8.8
	H44S/S-0815	4.8~6.8					17.0	12.5	8.8
	H44S/S-0817	6.8~8.8					19.0	14.0	8.8
	H44S/S-0819	8.8~10.8					21.0	16.0	8.8
	H44S/S-0821	10.8~12.8					23.0	16.0	8.8

## MATERIAL AND FINISH

	Material		Finish	
	Body	Mandrel	Body	Mandrel
Stainless Steel	Stainless Steel SUS 302	Stainless Steel SUS 304	Polished	Natural



# LOCK BOLT - LP

## SPECIFICATIONS

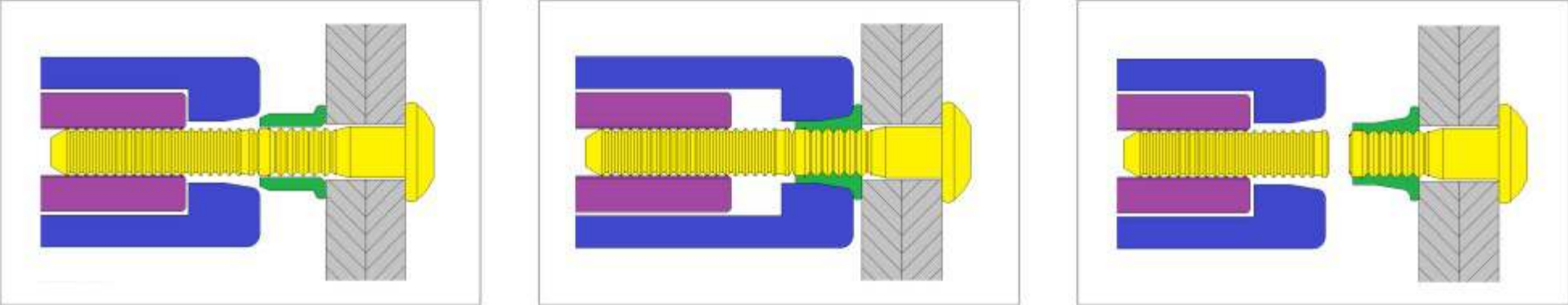
- Sizes : 4.8mm(3/16"), 6.4mm(1/4"), 8.0mm(5/16"), 9.6mm(3/8")
- Materials : Aluminum alloy, steel and stainless steel
- Headforms : Brazier and Truss head, Counter sunk head



## FEATURES

- Vibration-resistant
- High uniform clamp force

## TYPICAL PLACING SEQUENCE



## PART NO.

- PIN
- LP (Head Type) - (Material) - (Diameter) - (Grip Range) - (G or GA)

(Head Type)		(Material)		(Diameter)		(Grip No)
Brazier head	B	Carbon Steel	R	4.8mm	6	2~32
Truss head	T	Aluminum(2024)	A	6.4mm	8	2~32
90° Counter Sunk	90	Aluminum(6061)	C	8mm	10	4~32
		Stainless Steel	S	9.6mm	12	4~32

- (G) Zinc Plated(0.005mm) (GA) Zinc Plated(0.01mm)
- ex)LPB-A8-4 : Brazier head type, AL 2024, 6.4mm diameter, grip (4.8 ~ 7.9mm)

# COLLAR - LOCK BOLT - LP

- COLLAR

· LC(Collar Type) - Material - Diameter - G or GA

(Type)		(Material)		(Diameter)	
Standard type	S	Aluminum	A	4.8mm	6
Flange type	F	Stainless steel	S	6.4mm	8
Half type	H	Carbon steel	R	8.0mm	10
				9.6mm	12

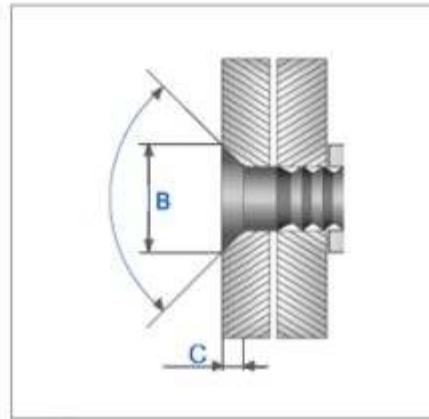
· (G) Zinc Plated (0.005mm), (GA) Zinc Plated (0.01mm)  
ex) LCS-A8 : Standard type collar, AL 6061, 6.4mm diameter

## MATERIAL

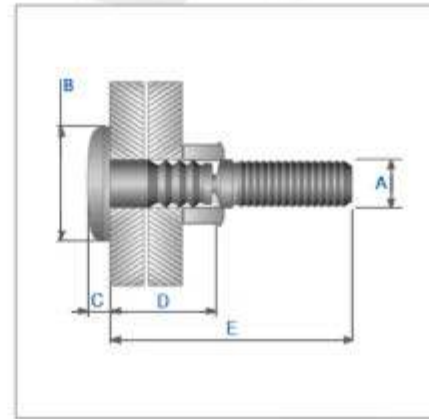
Material	Carbon Steel	Aluminum	Aluminum	Stainless Steel
Pin	AISI 1038	2024	6061	300 series s/s
Collar	AISI 1010	6061	6061	300 series s/s



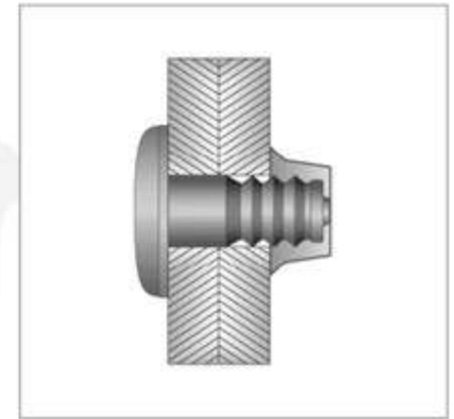
# LOCK BOLT - LP



Counter Sunk Head



Brazier, Truss head



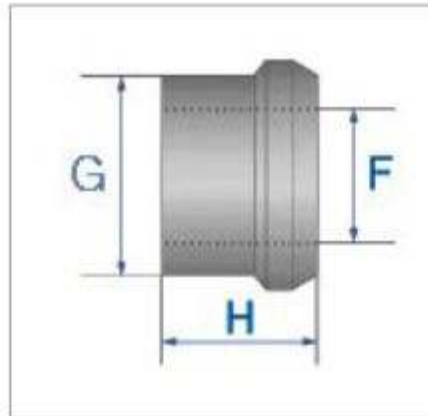
Dimensions in millimetres

Size	A	Recommended Hole size	Brazier Head		Truss Head		Counter Sunk Head	
			B	C	B	C	B	C
6 (3/16")	4.8~5.0	5.0~5.2	9.0~10.2	2.8~3.2	10.3~12.0	1.9~2.3	8.3~9.0	1.9~2.2
8 (1/4")	6.4~6.6	6.6~6.8	12.0~13.4	3.4~3.9	13.4~15.1	2.6~3.0	11.0~12.1	2.5~2.9
10 (5/16")	8.0~8.2	8.1~8.3	15.0~16.7	4.5~5.2	17.8~20.3	3.2~3.6	13.8~15.0	3.2~3.6
12 (3/8")	9.6~9.8	9.7~9.9	18.1~20.0	5.6~6.3	21.0~23.5	3.8~4.3	16.6~18.1	3.8~4.3

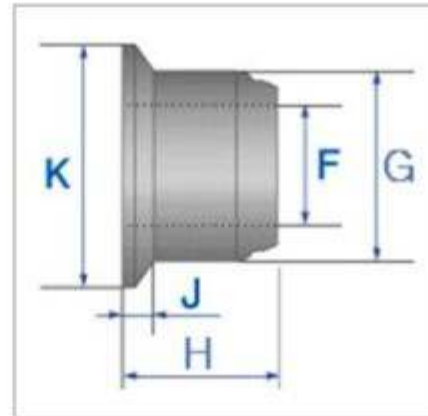
Grip No.	Grip Range		6(3/16")		8(1/4")		Grip Range		10(5/16")		12(3/8")	
	MIN	MAX	D (±0.8)	E (+4.0,-0)	D (±0.8)	E (+4.0,-0)	MIN	MAX	D (±0.8)	E (+4.0,-0)	D (±0.8)	E (+4.0,-0)
2	1.6	4.8	10.0	34.9	12.3	38.1						
3	3.2	6.4	11.6	36.5	13.9	39.7						
4	4.8	7.9	13.2	38.1	15.5	41.3	3.2~9.5	19	48.4	20.5	54.0	
5	6.4	9.5	14.8	39.7	17.1	42.9						
6	7.9	11.1	16.4	41.3	18.7	44.5	6.4~12.7	22.2	51.6	23.7	57.2	
7	9.5	12.7	18.0	42.9	20.3	46.0						
8	11.1	14.3	19.5	44.5	21.8	47.6	9.5~15.9	25.4	54.8	26.9	60.3	
9	12.7	15.9	21.1	46.0	23.4	49.2						
10	14.3	17.5	22.7	47.6	25.0	50.8	12.7~19.1	28.5	57.9	30.1	63.5	
11	15.9	19.1	24.3	49.2	26.6	52.4						
12	17.5	20.6	25.9	50.8	28.2	54.0	15.9~22.2	31.7	61.1	33.2	66.7	
13	19.1	22.2	27.5	52.4	29.8	55.6						
14	20.6	23.8	29.1	54.0	31.4	57.2	19.1~25.4	34.9	64.3	36.4	69.9	
15	22.2	25.4	30.7	55.6	33.0	58.7						
16	23.8	27.0	32.2	57.2	34.5	60.3	22.2~28.6	38.1	67.5	39.6	73.0	
17	25.4	28.6	33.8	58.7	36.1	61.9						
18	27.0	30.2	35.4	60.3	37.7	63.5	25.4~31.8	41.2	70.6	42.8	76.2	
19	28.6	31.8	37.0	61.9	39.3	65.1						
20	30.2	33.3	38.6	63.5	40.9	66.7	28.6~34.9	44.4	73.8	45.9	79.4	
21	31.8	34.9	40.2	65.1	42.5	68.3						
22	33.3	36.5	41.8	66.7	44.1	69.9	31.8~38.1	47.6	77.0	49.1	82.6	
23	34.9	38.1	43.4	68.3	45.7	71.4						
24	36.5	39.7	44.9	69.9	47.2	73.0	34.9~41.3	50.8	80.2	52.3	85.7	
25	38.1	41.3	46.5	71.4	48.8	74.6						
26	39.7	42.9	48.1	73.0	50.4	76.2	38.1~44.5	53.9	83.3	55.5	88.9	
27	41.3	44.5	49.7	74.6	52.0	77.8						
28	42.9	46.0	51.3	76.2	53.6	79.4	41.3~47.6	57.1	86.5	58.6	92.1	
29	44.5	47.6	52.9	77.8	55.2	81.0						
30	46.0	49.2	54.5	79.4	56.8	82.6	44.5~50.8	60.3	89.7	61.8	95.3	
31	47.6	50.8	56.1	81.0	58.4	84.1						
32	49.2	52.4	57.6	82.6	59.9	85.7	47.6~54.0	63.5	92.9	65.0	98.4	



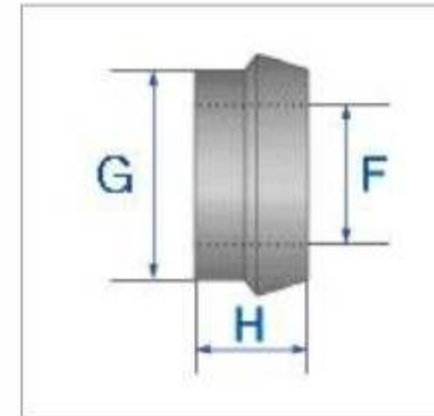
# COLLAR - LOCK BOLT - LP



Standard (LCS)



Flange (LCF)



Half (LCH)

Dimensions in millimetres

Type	Collar No.	Size	F	G	H	J	K
Standard	LCS-A	6 (3/16")	4.7~5.0	7.7~7.9	5.5~6.3		
	LCS-S	8 (1/4")	6.5~6.8	10.2~10.4	7.3~8.2		
	LCS-R	10 (5/16")	7.7~8.0	12.3~12.6	8.8~9.7		
		12 (3/8")	9.5~9.8	15.0~15.3	10.9~11.7		
Flange	LCF-A	6 (3/16")	4.7~5.0	7.7~7.9	6.3~7.2	0.7~1.6	9.1~10.0
	LCF-S	8 (1/4")	6.5~6.8	10.2~10.4	8.8~9.7	1.1~2.0	12.2~13.2
	LCF-R	10 (5/16")	7.7~8.0	12.6~12.9	10.0~10.9	1.5~2.4	15.4~16.3
		12 (3/8")	9.6~10	15.2~15.5	12.7~13.6	1.5~3.2	18.2~19.9
Half	LCH-A	6 (3/16")	4.7~5.0	7.7~7.9	3.3~4.2	2.4	
	LCH-S	8 (1/4")	6.5~6.8	10.2~10.4	4.3~5.2	3.2	
	LCH-R	10 (5/16")	7.7~8.0	12.3~12.6	5.7~6.5	3.2	
		12 (3/8")	9.5~9.8	14.9~15.3	7.6~9.5	4.0	

NOTE)

1. When using flange type collar, select the grip no. after addition of dimension (J) from thickness of part

## PERFORMANCE(Unit : kgf/KN) (1kgf≒ 9.8N)

	Size	Shear Strength	Tension Strength
Carbon Steel (R)	6 (3/16")	782 / 7.7	748 / 7.3
	8 (1/4")	1,380 / 13.5	1,360 / 13.3
	10 (5/16")	2,140 / 21.0	2,090 / 20.5
	12 (3/8")	3,100 / 30.4	2,950 / 28.9
Aluminum 2024 Pin(A) 6061 Collar(A)	6 (3/16")	476 / 4.7	454 / 4.4
	8 (1/4")	850 / 8.3	816 / 8.0
	10 (5/16")	1,330 / 13.0	1,290 / 12.6
	12 (3/8")	1,910 / 18.7	1,910 / 18.7
Aluminum 6061 Pin(A) 6061 Collar(A)	6 (3/16")	352 / 3.4	240 / 2.4
	8 (1/4")	624 / 6.1	442 / 4.3
	10 (5/16")	964 / 9.4	703 / 6.9
	12 (3/8")	1,380 / 13.5	1,090 / 10.7
Stainless(S)	6 (3/16")	907 / 8.9	660 / 6.5
	8 (1/4")	1,610 / 15.8	1,700 / 16.7
	10 (5/16")	2,510 / 24.6	1,930 / 18.9
	12 (3/8")	3,610 / 35.4	2,770 / 27.1



# LOCK BOLT - HLP ... HIGH STRENGTH

## SPECIFICATIONS

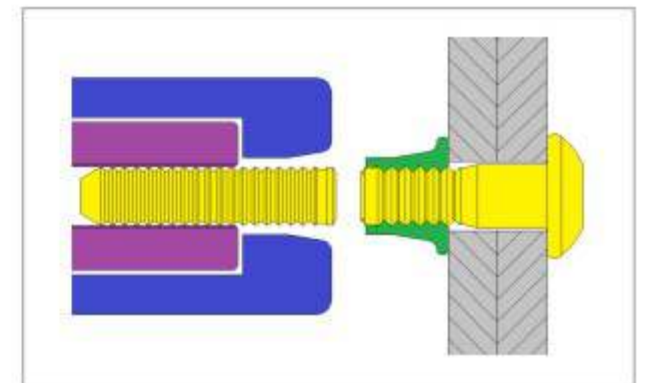
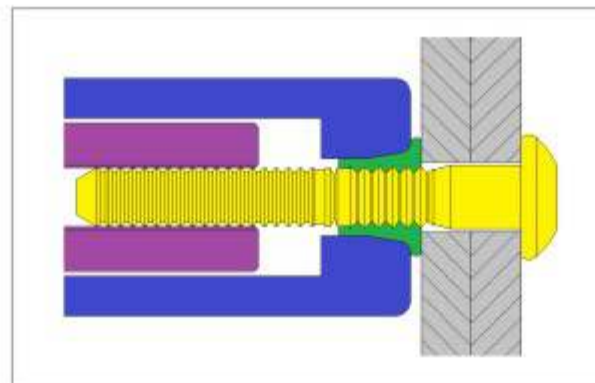
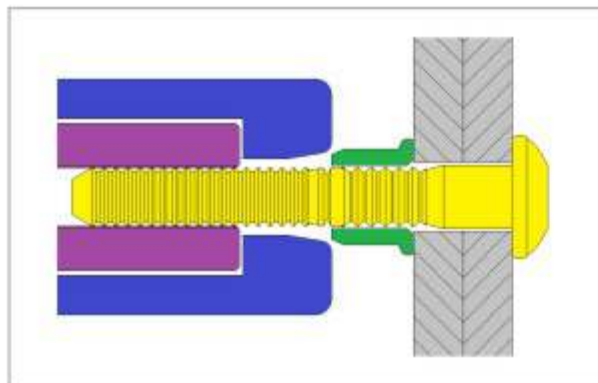
- Sizes : 12.7mm(1/2"), 15.8mm(5/8"), 19.1mm(3/4"), 22.2mm(7/8")
- Materials : Aluminum alloy, steel and stainless steel
- Headforms : Brazier and Truss head, Counter sunk head



## FEATURES

- Vibration-resistant
- High uniform clamp force

## TYPICAL PLACING SEQUENCE



## PART NO.

- PIN
- HLP (Head Type) - (Material) - (Diameter) - (Grip Range) - (G or GA)

(Head Type)		(Material)		(Diameter)		(Grip No)
Brazier head	B	Carbon Steel	R	12.7mm	16	4~80
Truss head	T	Aluminum(2024)	A	15.8mm	20	4~76
90° Counter Sunk	90	Aluminum(6061)	C	19.1mm	24	4~76
		Stainless Steel	S	22.2mm	28	8~72

- (G) Zinc Plated(0.005mm) (GA) Zinc Plated(0.01mm)

ex)HLPB-R20-12 : Brazier head type, Carbon Steel, 15.8mm diameter, Grip (19.1 ~ 25.4mm)

# COLLAR - HIGH STRENGTH

- COLLAR
- LC(Collar Type) - Material - Diameter - G or GA

(Type)		(Material)		(Diameter)	
Standard type	S	Aluminum	A	12.7mm	16
Flange type	F	Stainless steel	S	15.8mm	20
Half type	H	Carbon steel	R	19.1mm	24
				22.2mm	28

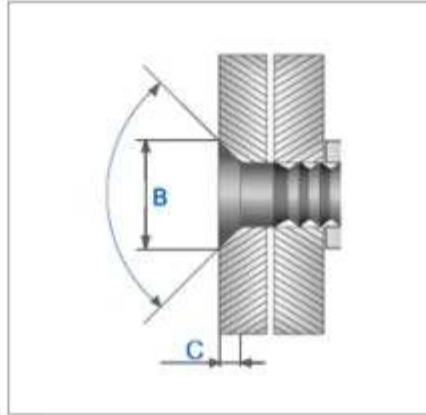
- (G) Zinc Plated(0.005mm), (GA) Zinc Plated(0.01mm)  
ex) LCS-R20 : Standard type collar, Carbon Steel, 15.8mm diameter

## MATERIAL

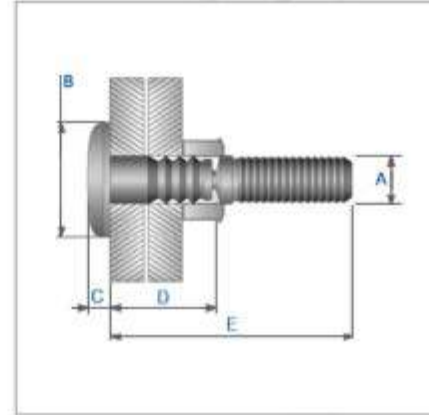
Material	Carbon Steel	Aluminum	Aluminum	Stainless Steel
Pin	AISI 1038	2024	6061	300 series s/s
Collar	AISI 1010	6061	6061	300 series s/s



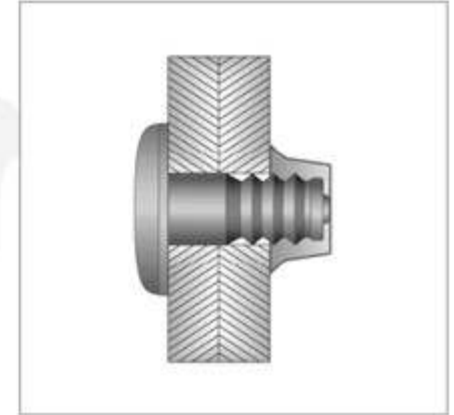
# LOCK BOLT - HIGH STRENGTH



Counter Sunk Head



Brazier, Truss head



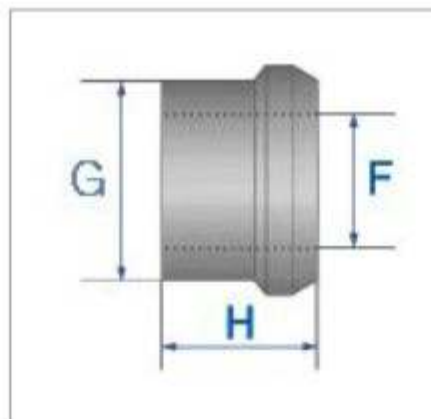
Dimensions in millimetres

Size	A	Recommended Hole size	Brazier Head		Truss Head		Counter Sunk Head	
			B	C	B	C	B	C
16 (1/2")	12.5~13.1	14.3	23.4	7.9	23.4	6.0	23.0	6.3
20 (5/8")	15.6~16.3	17.5	29.0	9.9	29.0	7.5	29.4	7.9
24 (3/4")	18.8~19.5	20.6	34.9	11.9	34.9	9.1	34.9	9.5
28 (7/8")	21.9~22.8	23.8	40.5	13.9	40.5	10.3	40.5	11.1

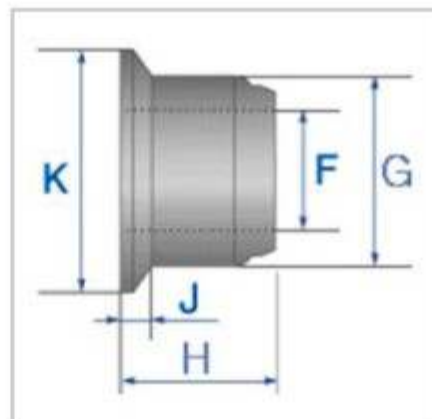
Grip No.	Grip Range		16(1/2")		20(5/8")		24(3/4")		28(7/8")	
	MIN	MAX	D (±0.8)	E (+5.0,-1.6)	D (±0.8)	E (+5.0,-1.6)	D (±0.8)	E (+5.0,-1.6)	D (±0.8)	E (+5.0,-1.6)
4	6.3	12.7	30.8	80.6	36.4	92.9	38.6	105.6		
8	12.7	19.1	37.2	86.9	42.8	99.2	44.9	111.9	48.8	119.1
12	19.1	25.4	43.5	93.3	49.1	105.6	51.3	118.3	55.1	125.4
16	25.4	31.8	49.9	99.6	55.5	111.9	57.6	124.6	61.5	131.8
20	31.8	38.1	56.2	106.0	61.8	118.3	64.0	131.0	67.8	138.1
24	38.1	44.5	62.6	112.3	68.2	124.6	70.3	137.3	74.2	144.5
28	44.5	50.8	68.9	118.7	74.5	131.0	76.7	143.7	80.5	150.8
32	50.8	57.2	75.3	125.0	80.9	137.3	83.0	150.0	86.9	157.2
36	57.2	63.5	81.6	131.4	87.2	143.7	89.4	156.4	93.2	163.5
40	63.5	69.9	88.0	137.7	93.6	150.0	95.7	162.7	99.6	169.9
44	69.9	76.2	94.3	144.1	99.9	156.4	102.1	169.1	105.9	176.2
48	76.2	82.6	100.7	150.4	106.3	162.7	108.4	175.4	112.3	182.6
52	82.6	88.9	107.0	156.8	112.6	169.1	114.8	181.8	118.6	188.9
56	88.9	95.3	113.4	163.1	119.0	175.4	121.1	188.1	125.0	195.3
60	95.3	101.6	119.7	169.5	125.3	181.8	127.5	194.5	131.3	201.6
64	101.6	108.0	126.1	175.8	131.7	188.1	133.8	200.8	137.7	208.0
68	108.0	114.3	132.4	182.2	138.0	194.5	140.2	207.2	144.0	214.3
72	114.3	120.7	138.8	188.5	144.4	200.8	146.5	213.5	150.4	220.7
76	120.7	127.0	145.1	194.9	150.7	207.2	152.9	219.9		
80	127.0	133.4	151.5	201.2						



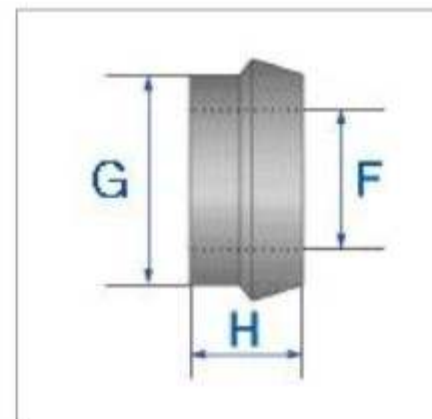
# COLLAR - HIGH STRENGTH



Standard(LCS)



Flange(LCF)



Half(LCH)

Dimensions in millimetres

Type	Collar No.	Size	F	G	H	J	K
Standard	LCS-A	16 (1/2")	13.0~13.8	19.4~20.4	15.4~16.4		
	LCS-S	20 (5/8")	16.5~16.9	24.6~25.7	21.4~22.3		
	LCS-R	24 (3/4")	19.6~20.1	29.6~30.0	23.6~24.4		
	LCS-R	28 (7/8")	23.1~23.8	34.1~35.0	27.5~28.3		
Flange	LCF-A	16 (1/2")	13.0~13.6	20.1~20.5	18.1~19.0	2.3~4.0	24.6~26.2
	LCF-S	20 (5/8")	16.5~16.9	24.6~25.7	23.5~24.4	3.1~4.8	30.9~32.6
	LCF-R	24 (3/4")	19.6~20.1	29.7~30.5	28.3~29.2	3.9~5.6	37.2~38.9
	LCF-R	28 (7/8")	23.1~23.7	34.5~35.0	33.0~33.8	4.7~6.4	39.6~41.3
Half	LCH-A	16 (1/2")	13.0~13.6	19.6~20.4	11.9~12.7	3.6	
	LCH-S	20 (5/8")	16.5~16.9	24.6~25.7	17.0~17.8	4.6	
	LCH-R	24 (3/4")	19.6~20.1	29.5~30.0	18.1~19.0	5.5	
	LCH-R	28 (7/8")	23.1~23.7	34.5~35.0	21.1~22.0	6.4	

NOTE)

1. When using flange type collar, select the grip no. after addition of dimension (J) from thickness of part

## PERFORMANCE(Unit : kgf/KN) (1kgf≒ 9.8N)

	Size	Shear Strength	Tension Strength
Carbon Steel (R)	16 (1/2")	6,530 / 64.0	7,730 / 75.8
	20 (5/8")	10,210 / 100.0	12,290 / 120.5
	24 (3/4")	14,700 / 144.0	18,190 / 178.3
	28 (7/8")	19,690 / 192.9	25,150 / 246.5
Aluminum 2024 Pin(A) 6061 Collar(A)	16 (1/2")	3,310 / 32.5	3,560 / 34.9
	20 (5/8")	5,170 / 50.7	5,580 / 54.7
	24 (3/4")	7,440 / 72.9	8,030 / 78.7
Aluminum 6061 Pin(A) 6061 Collar(A)	16 (1/2")	2,400 / 23.6	2,220 / 21.8
	20 (5/8")	3,760 / 36.9	3,480 / 34.1
	24 (3/4")	5,400 / 52.9	5,010 / 49.1
Stainless(S)	16 (1/2")	6,300 / 61.8	7,730 / 75.8
	20 (5/8")	9,530 / 93.4	12,290 / 120.5
	24 (3/4")	13,740 / 134.7	18,190 / 178.3



## SPECIFICATIONS

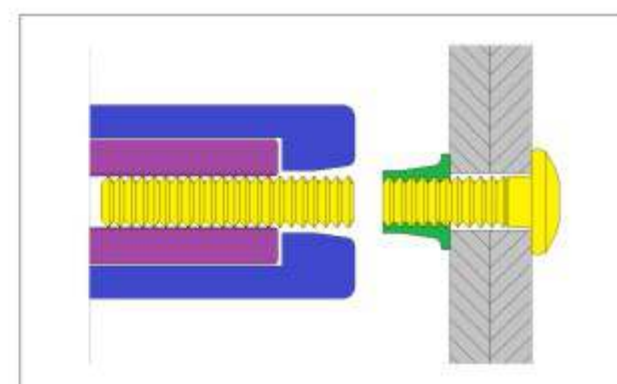
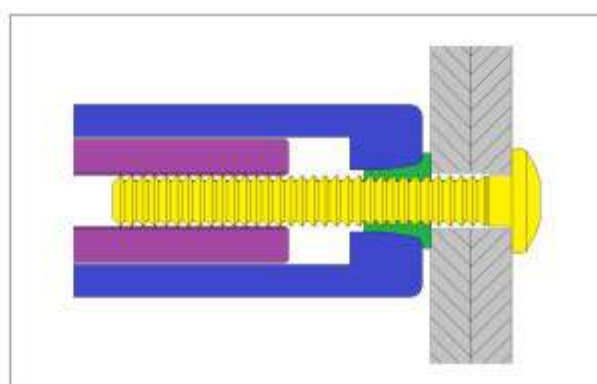
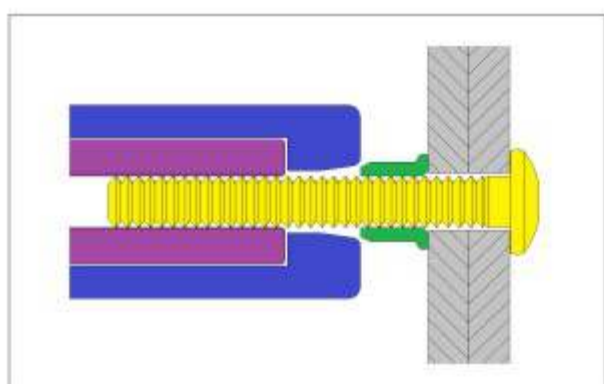
- Sizes : 4.8mm(3/16"), 6.4mm(1/4"), 8.0mm(5/16"), 9.6mm(3/8")
- Materials : Aluminum alloy and steel
- Headforms : Brazier and Truss head, 90° Counter sunk head

## FEATURES

- Vibration-resistant
- Wide grip fastening



## TYPICAL PLACING SEQUENCE



## PART NO.

- PIN

• M (Head Type) - (Material) - (Diameter) - (Grip Range) - (G or GA)

(Head Type)		(Material)		(Diameter)		(GripNo)
Brazier head	B	Carbon Steel	44	4.8 mm	6	10, 20
Truss head	T	Aluminum	76A	6.4 mm	8	10, 20
90° Counter Sunk	C			8.0 mm	10	12, 22
				9.6 mm	12	14, 26

• (G) Zinc Plated(0.005mm) (GA) Zinc Plated(0.01mm)

ex) MB76A-0610 : Brazier head type, AL 7075, 4.8mm diameter, grip (1.6~15.9mm)

- COLLAR

• MC(Collar Type) - Material - Diameter - G or GA

(Type)		(Material)		(Diameter)	
Flange Type	F	Carbon Steel	R	4.8 mm	6
Medium-Flange Type	M	Aluminum	A	6.4 mm	8
Wide-Flange Type	W			8.0 mm	10
				9.6 mm	12

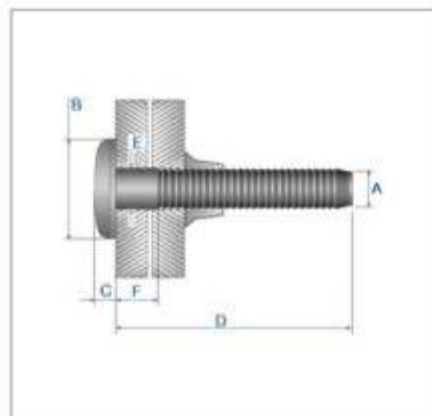
• (G) Zinc Plated(0.005mm) (GA) Zinc Plated(0.01mm)

ex) MCF-A6 : Flange type, AL 6061, 4.8mm diameter

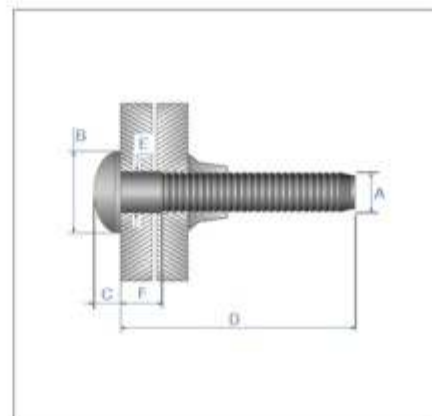
## MATERIAL

Material	Carbon Steel	Aluminum
Pin	AISI 1038	7075
Collar	AISI 1010	6061

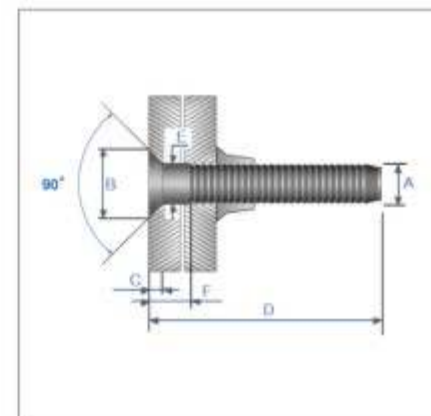
# MAX LOK



Brazier Head



Truss Head



Counter Sunk Head

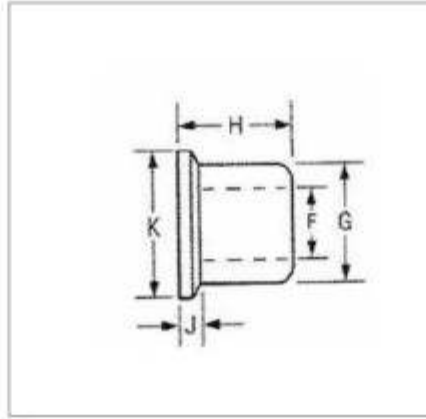
Dimensions in millimetres

Size	Part Number	Grip Range	Recommended Hole Size	A	B	C	D	E Ref.	F Ref.
4.8mm (3/16")	MB()-0610	1.6~15.9	5.1	4.7	9.0~10.1	2.8~3.2	45.4	4.9	2.7
	MB()-0620	7.9~31.7			9.0~10.1	2.8~3.2	69.3	4.9	7.8
	MC()-0610	1.6~15.9			8.2~9.2	2.3~2.6	45.4	4.9	2.8
	MC()-0620	7.9~31.7			8.2~9.2	1.9~2.3	60.2	4.9	7.5
6.4mm (1/4")	MB()-0810	1.6~15.9	6.7	6.3	12.0~13.4	3.4~3.9	49.9	6.4	2.8
	MB()-0820	7.9~31.7			12.0~13.4	3.4~3.9	65.0	6.4	7.5
	MT()-0810	1.6~15.9			13.4~15.1	2.6~3.0	49.9	6.4	2.8
	MT()-0820	7.9~31.7			13.4~15.1	2.6~3.0	65.0	6.4	7.5
	MC()-0810	1.6~15.9			10.9~12.2	3.0~3.3	49.9	5.6	3.6
	MC()-0820	7.9~31.7			10.9~12.2	2.5~3.0	65.0	6.4	7.5
8.0mm (5/16")	MB()-1012	3.2~19.0	8.3	7.8	15.0~16.7	4.5~5.2	59.4	7.0	6.4
	MB()-1022	15.9~34.9			15.0~16.7	4.5~5.2	72.1	8.1	13.6
	MT()-1012	3.2~19.0			17.8~20.3	3.2~3.6	59.4	7.0	6.4
	MT()-1022	15.9~34.9			17.8~20.3	3.2~3.6	72.1	8.1	13.6
	MC()-0812	3.2~19.0			13.7~15.1	3.7~4.2	59.4	7.0	4.3
	MC()-0822	15.9~34.9			13.7~15.1	3.2~3.7	72.1	8.1	14.2
9.6mm (3/8")	MB()-1214	3.2~22.2	9.9	9.4	18.1~20.0	5.6~6.3	73.0	9.7	4.4
	MB()-1226	20.7~41.7			18.1~20.0	5.6~6.3	88.9	9.7	20.2
	MT()-1214	3.2~22.2			21.0~23.5	3.8~4.3	73.0	9.7	4.4
	MT()-1226	20.7~41.2			21.0~23.5	4.8~5.1	88.9	9.7	20.2
	MC()-1214	6.4~22.2			16.5~18.2	4.5~5.0	73.0	8.6	5.9
	MC()-1226	20.7~41.2			16.5~18.2	3.8~4.4	88.9	9.7	20.2

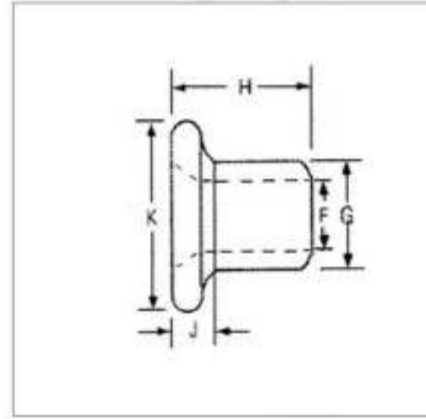
·():Aluminum-76A, Carbon Steel-44S



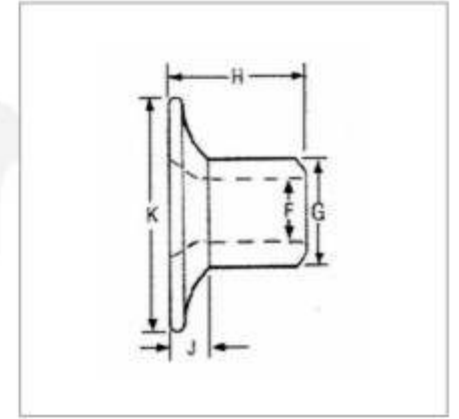
# COLLAR - MAX LOK



Flange ( MCF)



Medium-Flange (MCM)



Wide-Flange (MCW)

Dimensions in millimetres

Type	Collar No.	Size	F	G	H	J	K
Flange	MCF-A MCF-R	6(3/16")	4.8~5.0	7.7~8.0	6.7~7.3	1.0~1.4	9.2~9.8
		8(1/4")	6.3~6.7	10.1~10.3	9.1~10.0	1.3~1.8	12.1~13.3
		10(5/16")	7.9~8.2	12.7~13.0	10.9~11.4	1.7~2.2	15.3~16.4
		12(3/8")	9.5~9.8	15.3~16.0	12.4~13.3	2.1~2.6	18.5~19.6
Medium-Flange	MCM-A MCM-R	6(3/16")	4.8~5.0	7.8~8.1	7.3~8.2	2.1~3.0	12.5~13.6
Wide-Flange	MCW-A MCW-R	6(3/16")	4.8~5.0	7.7~8.0	7.3~8.2	2.2~3.0	16.2~19.2
		12(3/8")	6.3~6.7	10.1~10.3	10.9~11.8	2.9~3.7	21.7~25.4

## PERFORMANCE (Unit: kgf/KN) (1kgf ≒ 9.8N)

	Size	Shear Strength	Tension Strength
Carbon Steel (R)	6(3/16")	782 / 7.7	635 / 6.2
	8(1/4")	998 / 9.8	1,160 / 11.4
	10(5/16")	1,360 / 13.3	1,770 / 17.3
	12(3/8")	1,910 / 18.7	2,550 / 25.0
Aluminum (A)	6(3/16")	340 / 3.3	408 / 4.0
	8(1/4")	544 / 5.3	735 / 7.2
	10(5/16")	998 / 9.8	1,130 / 11.1
	12(3/8")	1,360 / 13.3	1,810 / 17.7

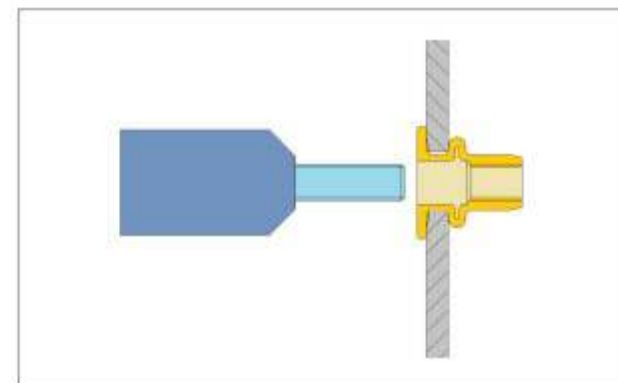
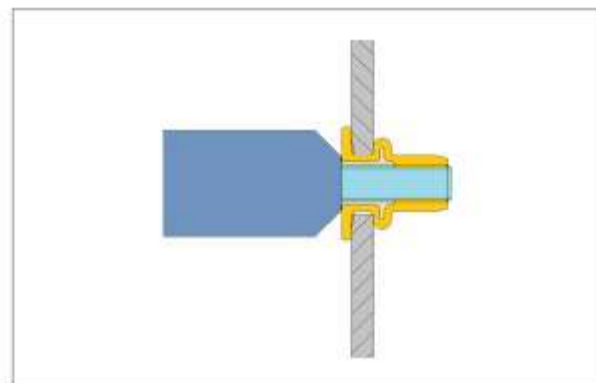
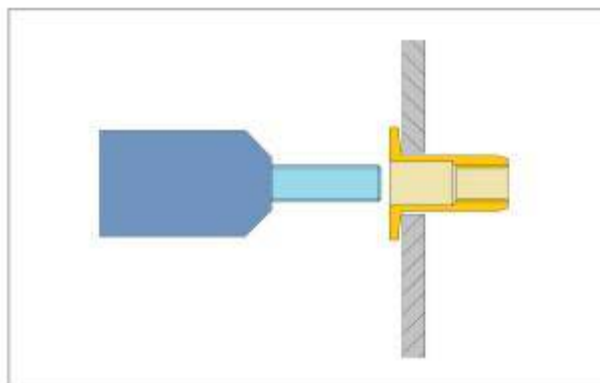
# OTHER PRODUCT

## POP NUT PART

- Additional torque resistance in soft workpieces
- Over head serration for spin-out force resistance with overlying workpieces



## TYPICAL PLACING SEQUENCE



## BOLT/NUT PARTS

### Automotive & other industry

- Special manufacture of the BOLT & NUT required by customers



## INSERT PARTS

### Automotive & other industry

- Precision cold-forging operations by hole
- Custom made to fit client needs







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