Electric Contact Rivets (River Type Electrical Contacts)

We manufacture solid contact rivets, bimetal contact rivets and button contacts with over twenty-year experiences of production technology of electric contact rivets, and also produces customized contacts to meet customer's demand. A variety of analytic and inspection equipment are utilized to ensure the quality in the varied steps of material incoming, processing and final goods. Electric contacts could be used for switches, breakers, magnetic contactors and relays.

●Properties of Electric Contact Rivet Materials

■Green Electric Contact Materials

Contact Material Series	NO.	Composition (%)	Hardness (Hv)	Electrical Conductivity (%IACS)	Density (g/cm^3)
Ag	★Ag-1	Ag 99.95	30~70	104	10.5
	Ag-1N	Ag 99.85,Ni 0.15	35~75	102	10.5
AgCu	U4	Ag 80, Cu 20	75~125	82	10.2
	★U5	Ag 75, Cu 25	80~130	75	10.1
AgNi	★N10	Ag 90, Ni 10	80~100	90	10.0
	★N15	Ag 85, Ni 15	85~105	85	9.9
AgSnO2	L8	Ag 92, SnO2 8	70~115	85	10.0
	★L10	Ag 90, SnO2 10	70~125	83	9.9
	S10	Ag 90, SnO2 10	80~120	75	9.6
AgSnO2In2O3	E8	Ag 92, SnO2In2O3 8	70~125	80	10.0
	★E10	Ag 90, SnO2In2O3 10	80~120	75	10.0
	E12	Ag 88, SnO2In2O3 12	80~125	70	10.0

★ We have inventory of above standard materials for quick delivery

■Traditional Electric Contact Materials

Contact Material Series	No.	Composition (%)	Hardness (Hv)	Electrical Conductivity (%IACS)	Density (g/cm^3)
AgCdO	B10	Ag 90, CdO 10	70~105	85	10.2
	★B12	Ag 88, CdO 12	70~110	85	10.2
	B14	Ag 86, CdO 14	75~115	80	10.0
	B15	Ag 85, CdO 15	78~118	78	10.0
	B16	Ag 84, CdO 16	80~120	75	10.0

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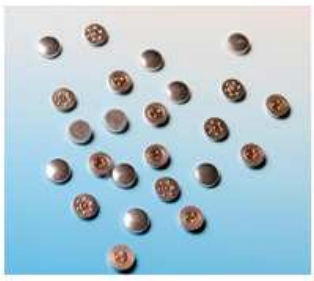
●Common types of Electric Contact Rivets

Solid Rivets

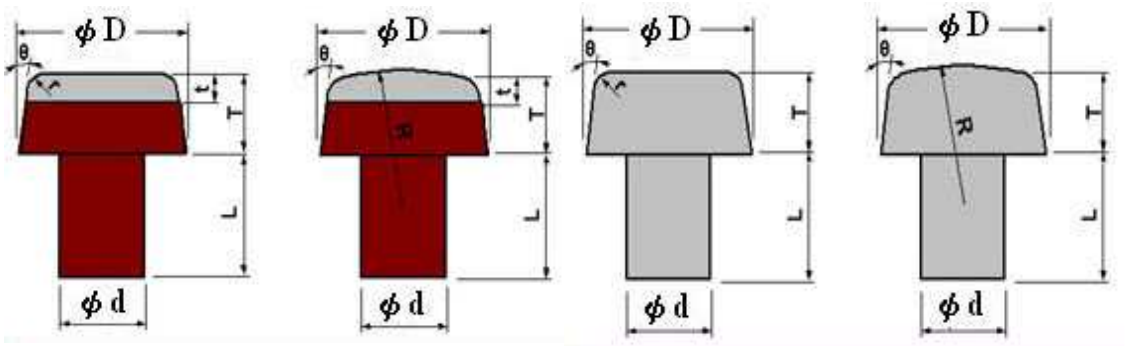
Bimetal Rivets

Button Contacts



●Common Sizes of Electric Contact Rivets

(Bimetal Rivet) (Solid Rivet)



Items	F/R		D	T	d	L	t	θ
Tolerance		± 2	± 0.1	± 0.05	+0 -0.10	+0.15 -0	± 0.1	± 2°
Common Size	F	3R	1.5	0.4	0.8	1.0	Solid	9°~15°
	F	4R	2.0	0.6 0.8	1.0 1.2	1.2 1.5		
	F	6R	2.5	0.6	1.5	1.0	[T=0.6] t=0.35~0.40	
	F	8R	3.0	0.8 1.0		1.5 2.0	[T=0.8] t=0.35~0.50 [T=1.0] t=0.35~0.60	
	F	8R	3.5	0.8	1.5 2.0	1.0 1.5	[T=0.8] t=0.40~0.50	
	F	10R	4.0	1.0	2.0	2.0	[T=1.0] t=0.40~0.60	
	F	10R	4.5	1.0	2.0	1.5	[T=1.0] t=0.45~0.60	
	F	15R	5.0	1.5	2.0 2.5	2.0 2.5	[T=1.5] t=0.45~0.80	
	F	15R	5.5	1.0	2.5	2.5	[T=1.0] t=0.50~0.60	
				1.5	3.0	3.0 3.5	[T=1.5] t=0.50~0.9	

●Design Reference of Electric Contact Rivets

Head Type (F or R)

In general, F type is designed for fixed contact while R type for movable contact. Please refer to the table of "Common Sizes of Contact Rivets" for dimension design. The tolerance of R figure of contact rivet is ±2R. Tolerance for brazed rivet is the same with that for contact tip and depends on the contact dimensions

Head Diameter (D)

(1) Head Diameter (D) Dimension:

●(D) should be the multiple of 0.5mm, e.g. φ1.5, φ2.0…. φ5.5,etc.(except the unit is by inch) Don't design the half crescent for (D) as it takes high tooling charge and easily causes the defects such like burrs, bad concentricity of contacts(due to asymmetric) and rough surface(because it' s hard to polished). All of these defects will block the auto-feeding and aiming-at during auto-bonding process.

●(D)≦2.4mm, solid type is more suitable than bimetal type. For heavy current test, we suggest to use brazed rivets with (D)>6.5mm.

●The maximum range of (D) could be the multiple of (d) by 1.7 ~ 2.3 times. Please note the multiple relation of (D) and (d) with above table.

(2) Tolerance of (D):

The tolerance of D is ±0.1mm in general. While (D)≦2.4mm, it could be ±0.075mm.

Head Thickness (T)

(1) Head Thickness (T)

The good design of head thickness is over 0.5mm for solid rivet and over 0.7mm for bimetal rivet. Too thick or too thin design increases the difficulty of producing. If possible, make the T thicker in view of increasing heat-dissipation area and reduce the temperature rising.

(T) could be 20%~40% of (D) for special design.
For example, (D) = 3mm, then (T) = 0.6~1.2mm.

(2) Tolerance of (T):

The tolerance of T is ±0.05mm in general. When (D) ≧6.0mm., it could be widened to ± 0.1mm. After bonding process, (T) will be thinner under the press of riveting and squeezing operation. Besides, after using of switch, the gap will be enlarged to lessen the spring press. Thus, it's better to take the upper limit.

Shank Diameter (d)

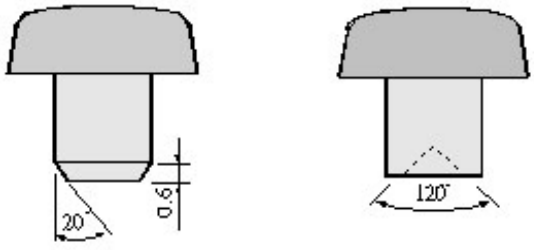
(1) Shank Diameter (d) Dimension:

Bimetal Rivet: Please assure to design (d) as the multiple of 0.5mm standard shank dimension, eg. φ1.5mm, φ2.0mm, φ2.5mm or φ3.0mm, otherwise, it requires new molds, new blades as well as irregular diameter Ag wire and copper wire. It might cause unstable quality,higher producing cost and longer delivery.

Solid Rivet: The design principle could be the same with above bimetal rivet. It's better for head diameter smaller than 2mm. Normal shank diameters are φ0.8, φ1.0 and φ1.2.

Chamfered Shank: It's better not to use the chamfered shank if the design of copper hole diameter and rivet shank diameter is suitable. If the chamfered shank is a must, we suggest to design the chamfered shank taper as 20° with the standard taper length by 0.6mm. (Please see below left sketch.)

Concave Shank: General "conical angle" of concave shank is 120°. The min. conical angle should not be smaller than 90°.(Please see blow right sketch.)



(2) Tolerance of (d):

Upper limit: +0. Lower limit: -0.1mm The upper limit of its tolerance is set at zero to prevent the rivet from being unable to be inserted into the corresponding hole in the support plate when the hole is formed with the smallest allowable hole

diameter.

The corresponding hole in the support plate should be produced larger than shank diameter by 0.05~0.10mm. In order to have a better bonding force between rivet and plate, flat surface and no-burr on plate is required ; otherwise the poor bonding will effect the longerity of contact.

Shank Length (L)

(1) Shank Length (L):

The shank length is normally thicker than support plate by 0.8~1.5mm(depend on the plate thickness and tolerance). It should carry to the multiple of 0.5mm. E.g. the plate thickness is 1.0mm, we calculate the suitable shank length as follows:

(a). (L) → 1.0 +0.8 = 1.8mm, carry to the multiple of 0.5mm → 2.0mm

(b). (L) could be lengthen to 2.5mm(1+1.5 =2.5mm) if there is enough space inside the switching appliance, especially while the dimension of corresponding hole tend to theupper limit.

It is because the longer shank could be riveted tightly with support plate than the shorter shank does.

(2)Tolerance of (L):

In general, it's +0.15/-0mm or ±0.1mm