



Selecting the Correct Blind Rivet

选择正确的空芯铆钉

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WORK THICKNESS

"Work Thickness" is the total thickness of all components to be riveted. The total work thickness determines which length blind rivet to use for the maximum shear and tensile values of the riveted joint and also the correct length blind rivet that will have the correct barrel length extending beyond the total work thickness to capture the mandrel head of an Open-End blind rivet, when the blind rivet is set.

The inch blind rivet part number has the maximum work piece thickness in the blind rivet part number, Example: Open-End blind rivet number 44. The first 4 is the diameter of the blind rivet body and the base number is 32. Therefore, 4 equals $4/32$. Reducing the fraction, 4 into $4 = 1$ and 4 into $32 = 8$, so a 44 is a $1/8$ (0.125) diameter blind rivet. The second 4 is the maximum work thickness that a 44 blind rivet can rivet together. The base number here is 16. Therefore, the second 4 equals $4/16$ and reducing the fraction, 4 into $4 = 1$ and 4 into $16 = 4$ so the maximum work thickness for a 44 blind rivet is $1/4$ (0.250). The minimum work thickness for this 44 blind rivet is $1/8$ (0.126). The maximum rivet body length is 0.400 and the minimum barrel length is 0.352.

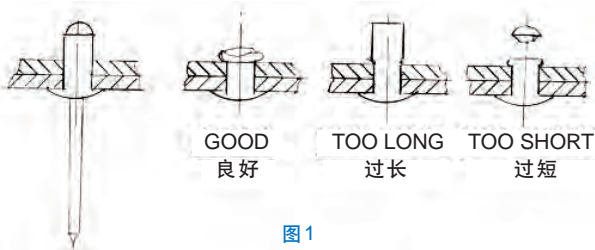


图1

HOLE SIZE

The hole diameter and condition of the hole used to set a blind rivet must be correct. The hole diameter and tolerances for each size blind rivet:

HOLE SIZE 孔径尺寸	
Rivet Diameter 空芯铆钉圆径	Hole Diameter 工作孔径尺寸
3/32	0.097-0.100
1/8	0.129-0.133
5/32	0.160-0.164
3/16	0.192-0.196
1/4	0.257-0.261

The correct hole diameter gives good hole fill and will give the user the proper shear and tensile values of the set blind rivet.



图2

工作厚度

「工作厚度」就是所有拉铆部件厚度之总合。总工作厚度决定什么样的空芯铆钉使用长度可以让拉铆接合部位达到最大剪切和抗张值，同时也决定空芯铆钉突出总工作厚度之外应该有的正确空管长度，在拉铆固定时，足以抓牢开端式空芯铆钉芯轴头部，可见图1说明。

英制的空芯铆钉以料号表示工件厚度的最大值。以开端式空芯铆钉44料号为例，第一位数的4表示空芯铆钉本体的圆径大小，由于底数是32，以4表示 $4/32$ 。经过约分之后，4约分为1，32约分为8。因此44料号表示空芯铆钉的圆径为 $1/8$ (0.125)。第二位数的4表示44料号空芯铆钉拉铆接合总工作厚度的最大值，由于底数是16，以第二位数的4表示 $4/16$ 。经过约分之后，4约分为1，16约分为4，因此44料号表示空芯铆钉总工作厚度最大值为 $1/4$ (0.250)，最小值为 $1/8$ (0.125)。铆钉本体最大长度为0.400，空管最小长度为0.352。

孔径尺寸

工件的孔径必须正确，而且空芯铆钉铆孔的状况必须良好。左表所示为工件孔径与各种空芯铆钉尺寸容忍值对照表。

正确的孔径可使铆孔填充状况良好，如图2，使空芯铆钉在拉铆后产生适当的剪切和拉伸值。



HOLE CONDITION

Hole condition is important to achieve the listed shear and tensile of the blind rivet being used. Hole burrs are the main cause of blind rivet failure regarding tensile strength.

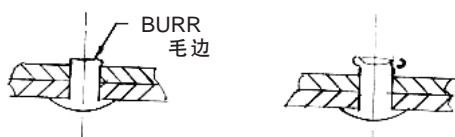


图3

Burrs will cut into the blind rivet body when the blind rivet is being set and this causes the upset side of the rivet barrel to be fractured and in some cases cut off the upset end of the rivet barrel. This condition will greatly reduce the tensile strength of the set blind rivet.

MATERIAL BEING RIVETED

Blind rivets are being used to fasten together many different types of material. Some materials will give the blind rivet user a problem if the application is not properly set-up. Example: Blind riveting steel to leather. One application that I was involved with, was riveting sleigh bells to leather. It is

always to have the soft material, in this case, leather at the flange side of the blind rivet and not the upset side.

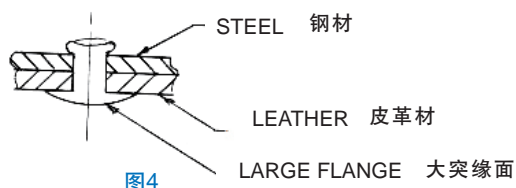


图4

A large flange blind rivet will not compress the leather as much as a dome head. If the flange of the blind rivet must be on the steel material, then a blind rivet "Back-up Washer" is used on the upset side.

When riveting thin sheet metal, always be sure that the sheet material is laying flat in the area that is being riveted.



图5

You must add 1/16 inch to the grip range of the blind rivet to accommodate the 1/16 thickness of the "Back-up Washer".

铆孔状况

铆孔状况对于空芯铆钉剪切和拉伸非常重要，见图3铆孔的毛边是空芯铆钉拉伸性异常的主要原因。

毛边在空芯铆钉拉铆进行时会插入空芯铆钉本体，导致铆钉空管拉铆翻出来的那一侧产生裂痕，在某些情况更导致这个部位断折。这种状况大大降低空芯铆钉拉铆后的拉伸强度。

拉铆接合的材料

空芯铆钉目前常用于不同材料部件的接合。若应用设计不当，有些材料会给空芯铆钉使用者带来问题，钢材与皮革的拉铆接合就是个例子。在一个雪橇和皮革的拉铆接合之应用实例中，软质材料(在这个应用例中就是皮革)必须置于突缘平面这一面，而不是拉铆翻出的那一面，见图4、图5。

空芯铆钉的大突缘面，相对于圆拱状头部，比较不会压迫软质材料。若是必须在空芯铆钉大突缘面上置放钢材，建议在拉铆翻出的那一面置放空芯铆钉所使用的「支撑华司」。

拉铆薄型金属材料时，必须确定金属板平放在拉铆操作位置。

空芯铆钉抓牢的长度必须预留1/16英吋，以容纳「支撑华司」1/16英吋的厚度。

空芯铆钉拉铆工具

空芯铆钉的长度若是正确，使用电动拉铆工具应该能够一次到位完成拉铆。这个法则适用于各种圆径和合金材质的开端式空芯铆钉，也就是(工业紧固件协会) 1F1-114 所规范的各种空芯铆钉。假如使用电动拉铆工具却不能一次完成拉铆，这个工具就应该送去维修。进行拉铆时，电动工具与拉铆工件应该垂直呈90度的角度关系，而且距离越近越好。电动拉铆工具若是没有垂直于拉铆工件，而偏离约15到20度，空芯铆钉心轴在拉铆时将受工具影响而弯折。以这种角度进行拉铆可能导致空芯铆钉心轴尚未完成拉铆就已经断裂，造成接合过度紧迫。