

Unique Blind Rivet Applications

by Anthony Di Maio

There are many different blind rivet applications that are unique and successful. The blind rivet back-up washer is an important component in solving unique blind rivet applications (Fig. 1).

Introduction of Back-up Washer

In some of the blind rivet applications, the back-up washer is the solution to the application. When riveting soft material such as leather-to-leather, leather to metal or wood, canvas to steel, etc. where the soft material is on the upset side of the blind rivet, the use of a back-up washer is required. **The back-up washer will allow the blind rivet to upset and apply the clamping force against the back-up washer and not against the soft material. Without the back-up washer, the upset side of the blind rivet will expand the blind rivet hole in the soft material and there will be little to no clamping force applied to the assembly.** If the soft material is on the flange or head side of the blind rivet, a large flange blind rivet should be used in order to distribute the clamping force over a larger area to prevent the flange or head of the blind rivet to compress into the soft material.

If you have a dome head blind rivet and you want to rivet soft material and the soft material is on the flange or head side of the blind rivet, use a back-up washer between the soft material and the flange of the blind rivet. Again, this application is when you are riveting soft material to harder material and the soft material is on the flange side of the blind rivet.

How to Apply

Back-up washers are produced in round and square configuration and are .060 (1.52 mm) thick. This is equivalent to one additional blind rivet length. Example: If you were riveting a total work thickness of 1/8 inch (3.17mm) and wish to use a 1/8-inch diameter blind rivet, you would use a blind rivet size 42. When you add the thickness .060 inch (1.52mm) of a back-up washer, you will then need a 43 size blind rivet (Fig. 2).

Fig. 1 / 图一

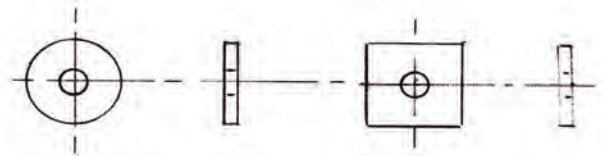
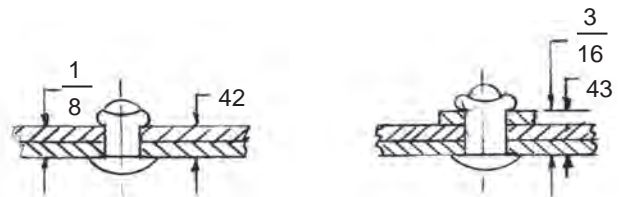


Fig. 2 / 图二



独特的拉钉应用 文 / Anthony Di Maio

业界中有许多独特且成功的拉钉应用。在解决这些独特的拉钉应用上，辅助华司 (back-up washer) 是一个重要的组件 (图一)。

辅助华司之采用

在某些拉钉应用中，其辅助的华司是该应用解决之道。当铆合软材料时，如皮革对皮革、皮革对金属或木材、帆布对钢铁等，若该软材料是拉钉要拉铆的那一边时，就必须使用辅助的华司。该辅助华司可协助拉钉拉铆，将锁紧力量施加于辅助华司上，而非软材料上。没有这个辅助华司，拉钉的外翻面会扩大软材料上的拉钉孔，那么组合件上就只施加到一点点，甚至全无锁紧力量。如果这些软材料是在拉钉的法兰或头部上，就要用大法兰的拉钉来将锁紧力量分布于较大的面积，防止拉钉的法兰或头部压陷入该软材料中。

如果你有一个圆顶头型的拉钉，你想铆合软材料，而该软材料是在拉钉的法兰或头部这边，那么在软材料与拉

Back-up washers are also used when the work piece to be riveted has over sized holes or elongated holes. Back-up washers can be used to compensate for the oversized or elongated hole when the riveted assembly is not subjected to high shear forces.

If the oversized or elongated hole is on the flange side of the blind rivet, a back-up washer can be used between the flange of the blind rivet and the work piece (Fig. 3).

Both drawings: “A” (Fig. 3) and “B” (Fig. 4) are good blind rivet solutions to where oversized or elongated holes are necessary to line up components of an assembly. You are able to position the components as necessary and still rivet the components together without the need to line up the blind rivet holes in the components. With the use of back-up washers, you will have good clamping force of the blind rivet exerted at the fastening joint. This offers increased production with operator ease because the lining up of the blind rivet holes has been eliminated.

Back-up Washer Features

Back-up washers are also used when an air space is required between components. Each back-up washer will give an air space of .060 inch (1.52mm). If 1/8-inch (3.17mm) air space is required, two back-up washers should be used (Fig. 5).

Fig. 3 / 图三

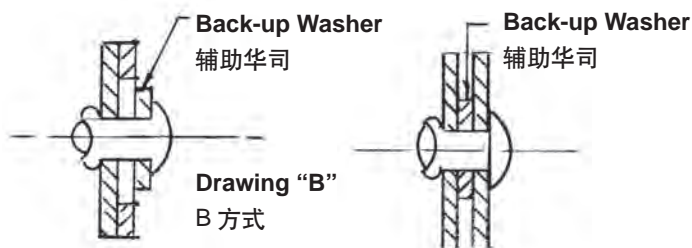
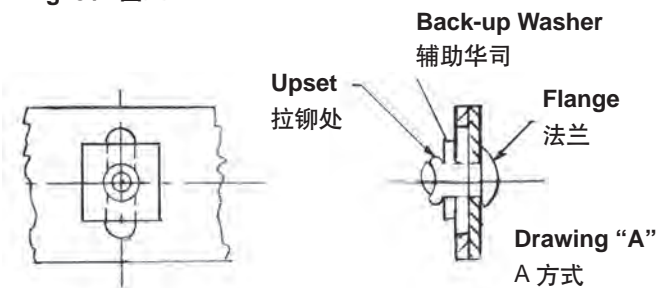


Fig. 4 / 图四

Fig. 5 / 图五

Back-up washers can be used with all types and sizes of blind rivets, open-end, closed-end, multi-grip, etc. Back-up washers can have different coatings and finishes on them to adapt to your blind rivet application. They can be painted to your color match.

钉法兰中间就要使用一个辅助华司。再此重述一次，这个应用适用于当你铆合一软材料与一较硬的材料，且这个软材料在此拉钉法兰边的情况。

如何应用辅助华司

辅助华司主要为圆形或四方形，厚度为 0.060 英寸（1.52mm）。这等于增加一个拉钉的长度规格。例如，若你正打算铆合 1/8 英寸（3.17mm）厚度的工件，想要使用一支 1/8 英寸外径的拉钉，那么你要用的拉钉尺寸是 42 号。但当你加上这个辅助华司的厚度 0.060 英寸时，你将得用 43 号尺寸的拉钉（图二）。

若欲铆合的工件有过大孔径的孔或过长的孔时，也要使用辅助华司。若铆合的组零件不需承受高剪力时，辅助华司可用来弥补过大或过长的孔。若过大或过长的孔是在拉钉的法兰边，那么在拉钉的法兰与工件间可使用一个辅助华司（图三）。

A 方式（图三）与 B 方式（图四）都是拉钉对于解决过大或过长的孔时，必须先把组件的各元件排成一线以便于接合之好答案。你可以将这些组件如所需排好位置，用拉钉铆合起来，而不需对准所有组件的拉钉孔。用了辅助华司，你就可以把好的拉钉锁紧力施加于要组合的组件上。此方式可让作业员轻松增加产量，因为不用再排好对准拉钉的孔。

Back-up washers are produced in steel and aluminum and are available in both round and square configuration and with holes diameters to accommodate 3/32 (2.3mm), 1/8 (3.17mm), 5/32 (4mm), 3/16 (4.74mm) and 1/4 (6.35mm) diameter blind rivets.

Each size back-up washer, both round and square, has the proper hole diameters for each diameter blind rivet. The dimensions of the back-up washers are universal to all blind rivet manufacturers and are a stocked item.

Back-up washers are also used in the Quality Control department to check the performance of a blind rivet. Because the back-up washer is .060 (1.52mm) thick, the blind rivet can be checked for performance at minimum and maximum grip range. Example: A 44 size blind rivet has a minimum grip range of .187 inch (4.75mm) and a maximum grip range of .250 inch (6.35mm). To check the performance of a 44 size blind rivet at minimum grip range of .187inch (4.75mm), you would use 3 back-

up washers. To check performance at maximum grip range of .250 inch (6.35mm), you would use 4 back-up washers.

Blind rivets are used in a wide range of applications in all types of manufactured products and are adapted through out the world. And the back-up washer further extends the use of the blind rivet in unique applications.

辅助华司之特性

组件之间需要有空间时，也会使用辅助华司。每个辅助华司都会提供 0.060 英寸 (1.52mm) 的空间，如果需要 1/8 英寸 (3.17mm) 的空间，就应该使用两个辅助华司 (图五)。

辅助华司可与所有型式和尺寸的拉钉一起使用，如开端式、闭端式、多抓紧力拉钉等。辅助华司可以有不同的涂层与表面处理方式，以配合你的拉钉应用。他们也可以上漆来配合使用者的颜色选择。

辅助华司有铝制与钢铁制、有圆形与正方形，孔的直径可配合 3/32 英寸 (2.3mm)、1/8 英寸 (3.17mm)、5/32 英寸 (4mm)、3/16 英寸 (4.74mm)，以及 1/4 英寸 (6.35mm) 直径的拉钉。

每个规格的辅助华司，不管是圆形或正方形的，都有适当的孔径可配合各种直径尺寸的拉钉。辅助华司的尺寸对所有拉钉制造商都是共通的，且属于会有库存的产品。

辅助华司也用于品管部门，用来检查拉钉的性能。因为辅助华司厚度为 0.060 英寸 (1.52mm)，可用来量测拉钉在其最小与最大抓紧范围的性能表现。例如一个 44 号的拉钉，其最小抓紧范围为 0.187 英寸 (4.75mm)，最大抓紧范围为 0.250 英寸 (6.35mm)。要检查规格 44 号的拉钉在最小抓紧范围 0.187 英寸 (4.75mm) 的性能表现，使用者需使用 3 个辅助华司，而要检查拉钉在最大抓紧范围 0.250 英寸 (6.35mm) 的性能表现时，使用者则需使用 4 个辅助华司。

拉钉的使用范围很广，包括各种制造产品，且在全世界适用。而辅助华司进一步延伸了拉钉在独特应用方面的使用。



About the Author

Anthony E. Di Maio attended Wentworth Institute and Northeastern University. In 1962 he started working with Blind Fasteners as Vice-President of Engineering & Manufacturing for two blind rivet manufacturers. He has been Chairman of the Technical Committee of the Industrial Fasteners Institute (IFI) and is still involved in the writing of IFI specifications. In 1991, he started ADM Engineering and is working with Fastener Manufacturers developing new fasteners and special machinery. He can be reached at ADM Engineering, 6 Hermon Ave., Haverhill, MA 01832; phone and fax 978-521-0277; e-mail: tdimaio@verizon.net.