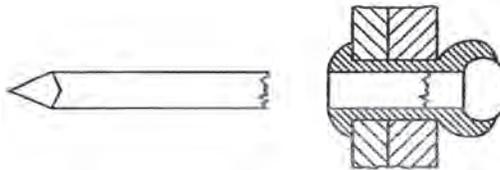


Blind Rivets

by Anthony Di Maio

Blind rivets are produced in many types and alloys. Some of the different types and their characteristics are as follows.

OPEN-END



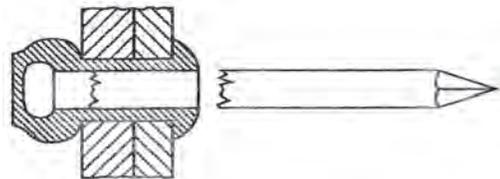
This rivet has an open end and the rivet body is hollow through its full length. The shear and tensile value of this rivet is a factor of the shear and tensile value of the rivet body. After setting the rivet, the mandrel (as shown) breaks just below the mandrel head. The mandrel head creates the upset of the rivet body and it is this upset that give the set rivet a tensile value.

The Open-End rivet is manufactured to the following alloys. Aluminum body / aluminum mandrel, aluminum body / steel mandrel, stainless body / stainless mandrel, stainless body / steel mandrel, steel body / steel mandrel, monel body / steel mandrel and copper body / steel mandrel.

Head types are regular dome head, large dome head and countersunk head. Rivet diameters are 3/32, 1/8, 5/32, 3/16 and 1/4.

After the rivet is set, the mandrel head must stay locked in the bulge formed by the mandrel head and must stay locked in the rivet body when a 2 lb. minimum force is applied to the mandrel head. Because of this 2 lb minimum mandrel head retention requirement, two types of mandrel head configurations are used, the round and oval head. The oval head design is used when setting rivet bodies made of steel, stainless and monel.

CLOSED-END



This rivet has a closed end on the upset side of the rivet. The rivet body is not hollow through its full length.

The mandrel breaks just below the mandrel head, but the mandrel head is totally enclosed in the rivet body. This feature ensures that the mandrel head will not become loose from the rivet body. This is a good feature when the rivet is used in a water or gas application. Sealant can be applied to the barrel side of the flange (not shown) to ensure that a water or gas seal is created through the hole in the work piece.

Head types are regular dome, large dome head and countersunk head. Rivet diameters are 1/8, 5/32, 3/15, 1/4

The closed-end rivet is manufactured of the following alloys. Aluminum body / aluminum mandrel, aluminum body / steel mandrel, aluminum body / stainless mandrel, steel body / steel mandrel, stainless body / stainless mandrel, stainless body / steel mandrel and copper body / steel mandrel.



Structural Flush Break Open-End

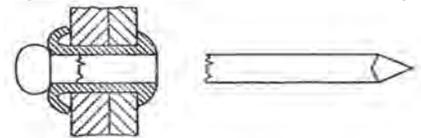
The rivet body is the same design as the open-end type rivet, but the mandrel is manufactured to break just below the head of the rivet body when the rivet is set.

The advantage of this rivet is the increased shear value. The steel body / steel mandrel 1/8 diameter open-end rivet has a shear value of 260 lbs. min. and the steel body / steel mandrel 1/8 diameter structural flush break rivet has a shear value of 450 lbs. min.

Manufactured to the following alloys, aluminum body / aluminum mandrel, aluminum body / steel mandrel, steel body / steel mandrel, stainless body / stainless mandrel, stainless body / steel mandrel and copper body / steel mandrel.

Head types are regular dome head, large dome head and countersunk.

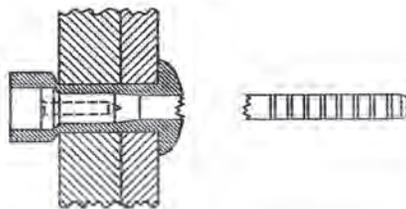
SPLIT RIVET



When setting this rivet, the mandrel head splits the rivet body into two or more segments. This rivet functions well in oversized holes in the work piece.

There are still more blind rivets available. There is a blind rivet for most applications. Special rivets are manufactured with low mandrel tensile values that function well in applications where brittle material is being riveted together. The low mandrel tensile strength will give a softer clamp load when setting the rivet and avoid damaging the work piece. □

Structural Flush Break



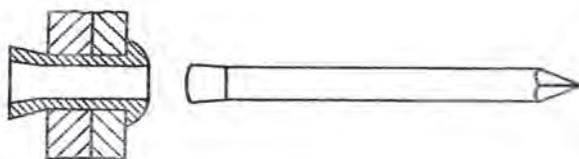
This is a flush break rivet. Flush break means that the mandrel breaks flush or just below the head of the rivet body. The head of the mandrel will elongate as the mandrel is pulled and the head of the mandrel will set just below the end of the rivet body. The mandrel head will always set just below the end of the rivet body at all work thicknesses. Example: 1/4 diameter structural rivet size 810 has a grip range of .080 to .625 and the mandrel head of this rivet will always set at the same position inside the rivet body in the complete grip range. It will be in the same position at .080 up to .625.

This rivet is manufactured in two diameters 3/16 and 1/4 and in aluminum body / aluminum mandrel, steel body / steel mandrel.

After setting the mandrel will be mechanically locked in the rivet body.

This rivet has high shear and tensile values. A 1/4 diameter steel body / steel mandrel has a minimum shear value of 2,400 lbs. and a minimum tensile value of 1,850 lbs.

Pull Through Mandrel



This rivet has a setting tool that contains a re-useable mandrel to set the rivet body. The mandrel is pulled completely through the rivet body leaving a hollow set rivet body.



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.