

WEBANCOR

WEB & CORE TECHNOLOGIES INC.

WEBANCOR is a registered trade mark

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FAQ'S FOR AIR SHAFTS AND CHUCKS

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WHAT BODY MATERIAL SHOULD I CHOOSE?

Air Shafts are made out of a variety of materials, for example, steel, aluminum, and carbon fiber are the current popular materials.

Pick Steel bodies for Heavy duty, long life and heavy loads. Steel has the strength and durability to do the job, it was the first type of material to use. Sometimes steel shafts can be so heavy that a mechanical shaft handler is required.

Pick aluminum for light weight and easy of handling. Aluminum shafts do not have the strength for narrow heavy loads, but can handle heavy loads when a full width roll is on the shaft. When the single roll is almost the full width of the shaft, its load is transferred to the shaft bearings. If a heavy narrow roll is on an aluminum body shaft, the shaft body has to handle the load and will tend to bend. The bending of a shaft will quickly damage the shaft, and becomes very dangerous, no matter what the material. When "Safety Chucks" are used to support the shaft, the chucks can jam, open or closed due to the bending of the shaft. Safety Chucks will not tolerate any deflection of the shaft.

Pick Carbon Fiber body shafts for strength and lightness. Remember when we say strength we only mean stiffness or the resistance to deflect under load. Carbon Fiber shafts are made up of long strands of Carbon, and surrounded with **PLASTIC** holding the strands together. These shafts give no warning before breaking due to overloading, this is known as **catastrophic failure**. CF shafts can be sheathed with sleeves of aluminum, steel, or Kevlar. The sleeve is designed to protect the soft plastic body. The sleeve adds to the shafts weight and reduces its resistance to deflection. Metal sleeves have a difference co-efficient of expansion than CF and as a result usually delaminate. Delamination occurs if the bond between the sleeve and the body is broken. When this happens the sleeve no longer give any strength to the body, and will wear away the plastic matrix. This leads to complete shaft failure.

SHOULD I HAVE LUG, BUTTON, LEAF OR STRIP SHAFTS?

The lug type:- WEBANCOR manufactures more lug type air shafts than any other. The lug type has the best grip, and the least problems of any shaft. It is used for general purpose corfe handling, for sturdy cores. It provides the strongest shaft body Lugs do not require retraction springs that will break and puncture the air bladder, as do button type. Single bladder lug shafts have been known to last for many years without service.

The button type:- One of the oldest forms of air shaft grippers. Requires retraction springs that can break and puncture the air bladder. The large buttons type does not grip as good as the lug type. The small button shaft is sometimes used for narrow slit widths. Is expensive and troublesome to repair.

Leaf type:- The leaf type is **required** when thin wall cores are used (i.e. 1/8" thick for example) Lug and button type will distort a thin wall core, causing problems with the wind-up. The leaf type shaft gives almost 360 degree contact with the core. The leaf type should not be expected to work as a differential shaft.

Strip Shafts:- This type of shaft has grippers usually the full length of the body. The main selling point of these shafts is "ease of repair". Each strip can be changed fairly quickly, but takes a lot of attention to keep the air seal. Unfortunately these strips wear our quickly and have to be changed frequently, reducing any advantage that the speed of repair would provided. The strips usually are expensive, and available usually only from the shaft manufacturer, as each manufacturer have their own style.

WHAT LOAD CAN MY SHAFT HOLD?

When ordering an air shaft, the user needs to provide the Air Shaft manufacturer with the information needed to properly design the air shaft. Reliable Air shaft manufacturers use CAD CAM engineering software to make sure that the shaft will handle the required load.

When a shaft is used only on wide rolls, that are close to the width of the shaft, the air shaft can handle a quite a heavy load, since the shaft itself only acts as a guide for the roll. The shaft bearings are the limiting factor.

HOWEVER when a narrow roll is used on a wide shaft, it's the shaft that has to support the roll, and if its not strong enough the shaft will bend dangerously. The amount of bend can overcome the safe load capacity of the air shaft and the shaft can break. It is very important, when "SAFETY CHUCKS" are being used, to make sure that the shaft does not bend. Bending of a shaft can "jam" the safety chucks so that they wont open. The manufacturer can supply the information that shows the safe load for different widths of roll on each particular shaft.

One thing to watch for, will be the manufacturers own idea of a "SAFETY FACTOR". When asking the manufacturer for the loads for a shaft, ask what they use for the safety factor. A reliable core shaft manufacturer will not sell you a shaft that is not safe to use for your application, but in order to do that, they will need the correct information.

WHY DOES THE ROLL SLIP ON THE SHAFT?

Air shaft ratings are at an air pressure of 85-90 psi (about 6 bar). That means for example at 90 psi the shaft will control 1800# of roll. If the operator only inflates the shaft to 45# the shaft will barely hold 900#. It should be noted that the lugs/buttons will be extended at about 30 psi. but at this pressure they will not grip much roll weight. WEBANCOR lug type shafts will hold approximately 100# of roll weight at 90 psi per lug inside the core. Note if the roll is very narrow, compared to the shaft, not many lugs will be working to hold the roll. If the pressure is low then there is not much hope the shaft will handle the weight that will be expected. WEBANCOR air shafts have stamped in the body near the air valve. "INFLATE TO 85-90 PSI"

*******NOW** this means 85-90 psi in the shaft, just because you have 90-100 psi in the air line as shown on the guage, it does not mean you will have that pressure in the shaft. It takes time to build up the pressure inside the shaft. Use of a guage on the air line will show the pressure drop when the inflator is used to put air into the shaft, you can them watch the pressure build up with the guage until it reaches the correct pressure. Underinflation will also wear out the inside parts of the shaft prematurely.

WHAT ARE DIFFERENTIAL SHAFTS?

Differential shafts are essentially rewind shafts, either air or mechanical, that allow slit rolls to wind separately on the same shaft. This allows rolls with thicker parts to build up at a different rate, so that web tension will stay constant and the rolls will wind up at each own individual rate.

There are four different types of differential types for different purposes. They are usually quite expensive so you have to make sure the one you order will do the job you expect from it. Quite often manufactures only make one type and say it works for all applications. They don't and there are a lot of disappointed customers out there that find out too late.

DOES A SHAFT LOOSE STRENGTH AS IT GETS OLDER?

Metal air shafts continually flex with any amount of load on the shaft. The result of this flex can be noticed if you feel the body of the shaft at the end of the roll. This area can get quite warm, showing that there is flex, and this flex results in metal fatigue. Metal fatigue end up as a broken shaft. Make sure that you know the load limits of the shafts.

Carbon fiber shafts also suffer from fatigue, and usually give no warning before failing.

Load limits provided by the shaft manufacturer apply only to new shafts, and must be derated as the shaft gets older.

CHUCKS OR SHAFTS, WHICH IS BEST?

Without a doubt, shafts are better. Chucks should only be used when there is an occasional core size change. Chucks should be considered a light duty solution only. Chucks have a much smaller gripping area than the full length of a shaft, and cannot carry the same load as a shaft, especially at higher speeds.

An aluminum body airshaft for 6" dia. Cores can actually weigh less, and carry more weight than a steel body 3" shaft with 6" chucks. The 6" shaft might cost a little more than the 3" shaft and chucks but the 6" shaft will last much longer, and will hold much more weight preventing slippage, and loss of register in high speed presses.

WHAT TYPE OF CHUCK SHOULD I BUY?

There are a number of different types of chucks on the market, "Tire type", lug, button, leaf. Each manufacturer have their own types, and some work better than others in certain applications, just as with air shafts.

The **tire type** will grip all cores, fiber, and metal.

Lug type are good for fiber cores but if metal lugs, should not be used with metal cores.

Button type, same as lug type.

Leaf type is required for thin wall cores or narrow slits on one chuck.

Air Chucks are usually made of Aluminum, with some light duty chucks made with composites. This means that they are light weight.

Mechanical operated chucks are usually steel, weigh a lot more, and usually reserved for shaftless type applications, where weight does not matter.

Mechanical chucks can be lug, or "pad" types. Lug type are usually cheaper but can damage the core. The pad type are more expensive, and require more maintenance but usually won't damage the core.

