



Hole Punch Cylinders Overview

The purpose of this document is to explain the use of the hole punch cylinder and to highlight some of the design benefits which have been added to extend the life of the cylinder as compared to simply modifying conventional air cylinders to look like hole punchers.

Our hole punch cylinders are designed to punch polyethylene film only. A typical application is for plastic bags similar to those which hold prepackaged candies on grocery store racks or the plastic bag material that covers dry cleaning. This equates to a thickness maximum of 3 mils. Any applications requiring punching a material thicker than this should be avoided because of problems both punching through the material and in ejecting the material from the end of the cutter.

At first glance the hole punch cylinder looks exactly like our conventional 3/4" bore, single acting, Original Line® cylinder. However the cylinder design has been specifically engineered for punching applications. The piston rod assembly has a 1/16" diameter hole through its length. This hollow rod allows air pressure to blow through the rod and out the cutter, thus ejecting the material from the cutting head each cycle. A nickel plated steel rod guide has been included to lengthen overall life expectancy by withstanding the constant impact of a high cycle cutting operation. Maximum cycle rate for this cylinder is 150 cycles/min. A felt washer soaked with our HT-99 lubricant is installed into the rod guide to give the rod a constant source of lubrication, again adding to the overall life of the cylinder. Additionally double acting bumpers and a special spring are included in this application specific design.

Occasionally customers will question the air consumption of particular cutters. This can be calculated in a two step process. First determine the consumption of the cylinder itself exactly as you would for a standard Original Line® cylinder based on the volume of the cylinder and the number of strokes per minute to obtain a cubic feet per minute value. Additionally we must determine the amount of air flowing through the hollow rod. This amount can be calculated given the 1/16" diameter hole through the rod. Given this orifice diameter an air flow value can be obtained from a table listing air flow through sharp edged orifices. For example, our hole punch cylinder operated at 80 psi and running one cycle per second will consume approximately 2.9 CFM. Varying the cycle rate will affect the first part of this equation (doubling the cycle rate will double the volume to fill the cylinder per minute) but the second part will remain unchanged because the valve will still only be open for half the time period, (open on extend and closed on retract).

The information presented is in Bimba's best engineering opinion and should be used for reference only. Recommendations derived should be verified under actual operating conditions. Bimba reserves the right to change specifications without prior notice.

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