

Onflow Systems is committed to excellence in quality, performance and customer satisfaction



# OnFlow Non-recirculating Damper

Engineered to control air recirculation in  
Fan Array Systems



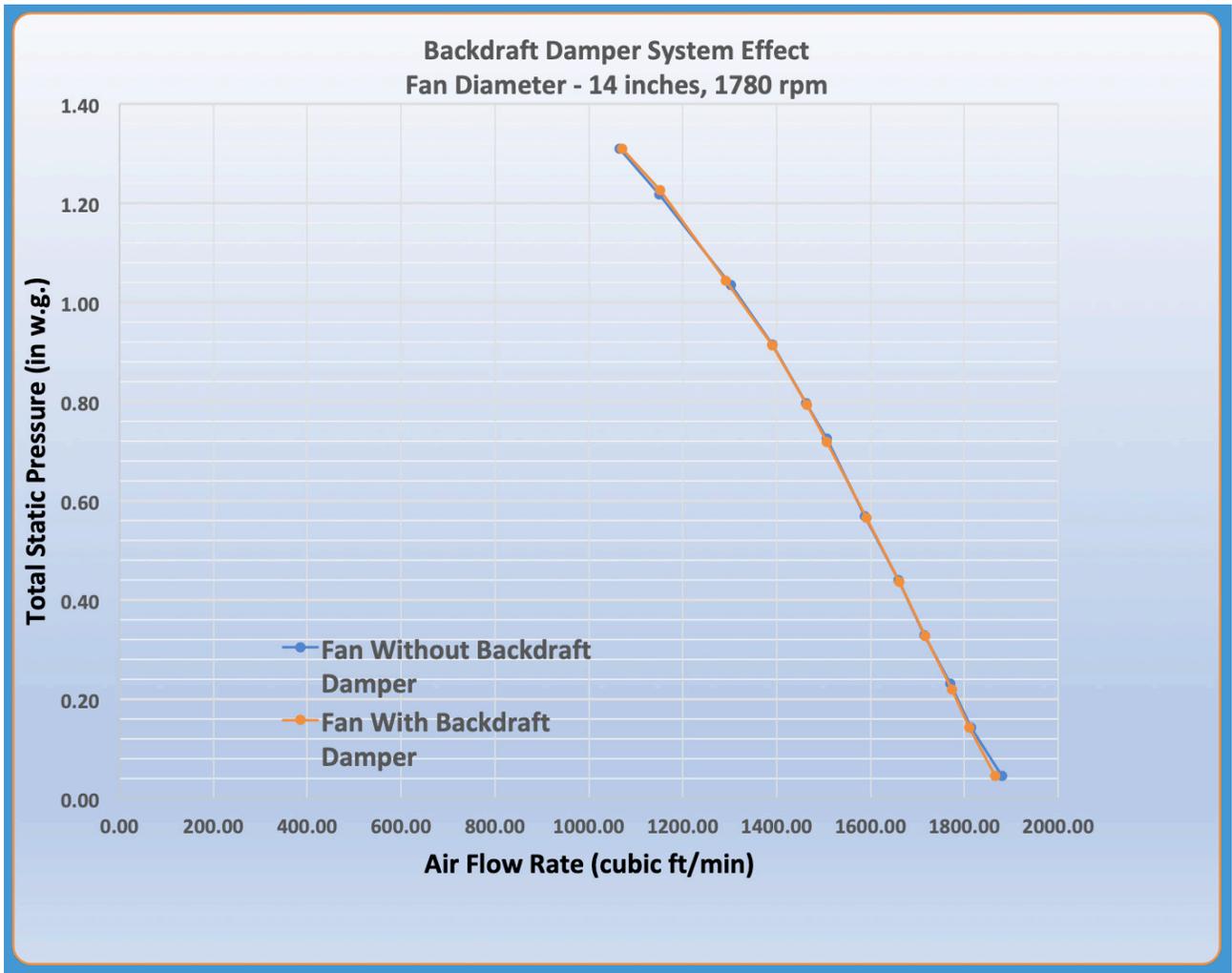
## Near Zero Back flow

OnFlow Non-recirculating damper is typically >99% effective in preventing recirculated air

## Fan is allowed to operate at full flow and efficiency

The OnFlow back draft damper will automatically shut off recirculated air in the event of a fan shutdown. Gravity back draft dampers rely on air velocity to force the damper open. The amount of force is proportional to the weight of the blade and the degree it is allowed to open. The force used to open the damper is wasted energy and contributes to a loss in: fan performance, loss

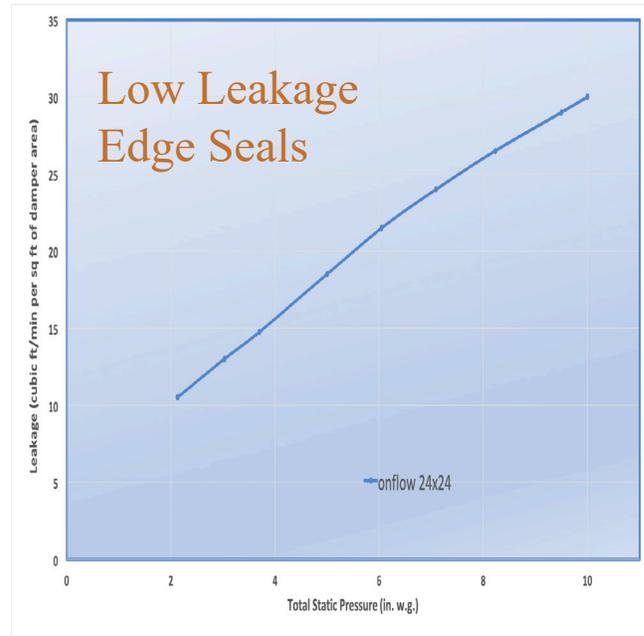
in efficiency, higher power consumption and higher noise. The OnFlow damper does not rely on velocity pressure to open as blades are vertically oriented on independent bearings that allow the blade to follow the local slipstream with little resistance to airflow.



- Preserves fan performance
- Blades follow air slipstream
- Static pressure up to 12"

**Sizes 12 to 60"**

## Tested for Air Performance and Leakage



# Background



One of the most important features of using fan arrays is the concept of redundancy or the ability to maintain air flow in the event of a fan failure. In 2003 while developing the fan array concept, Larry Hopkins understood the need to limit or prevent air recirculation. Redundancy is commonly known as N-1 operation. When this occurs, remaining fans are sped up to compensate for lost air capacity. For example, approximately 8% of a fan array's capacity is lost if one fan fails in a 9 fan array. Many critical systems are designed for N-2 or N-3 redundancy. The only way to accomplish this in a fan array is to block the return path of the non-operational fans.

Initial efforts to manage air recirculation were based on using gravity type backdraft dampers or plates applied to the fan inlet. With gravity dampers air

entering the fan is used to open the blades and gravity is used to shut the blades when the fan is off. The problem with this approach is energy used to open the blades is lost in the form of added static pressure. The losses are significant, typically 0.5" or more which may be 25% on low pressure high volume systems. Another significant problem is increased noise. The combination of a drop in fan performance and higher noise make gravity dampers a poor choice for fan array applications.

To counter the negative effects of horizontal damper blades, Hopkins teamed with Josh Foos to work on an entirely new approach where blades were oriented vertically and allowed to rotate independent of one another. Unlike other designs relying on gravity, the Onflow damper closes in the

presence of air attempting to recirculate to the inlet plenum. In this configuration, the blades present very little resistance to airflow, little or no added sound and well as a reduced footprint. With outstanding test results, Hopkins and Foos went on to develop the first commercially viable efficient backdraft damper. Now on their third generation, the OnFlow Non recirculating Damper features precision extruded anodized blades with 100% blade seals, stainless steel corners, permanently sealed bearings and structural strength to handle over 12" static pressure.

As principals of OnFlow Systems we are committed to providing the highest quality and customer satisfaction in every product we offer.

Larry Hopkins,  
Josh Foos  
Earl Barfield



**Extensive Experience and  
World Class Performance**

**Leading Edge  
Technology**

**STANDARD CONSTRUCTION**

**FRAME** - 3.5" X 1.5" 6063 T5 heavy gauge mill finish or anodized aluminum extrusion

**BLADES** - 3" wide 6063 T5 mill finish or anodized aluminum extrusion with reinforcement channels

**BEARINGS** - Permanently sealed SAE 52100 ball type

**STRUCTURAL CORNER** - 300 series stainless steel

**BLADE END CAPS** - 300 series stainless steel

**BLADE SEALS** - Extruded santoprene TPE

**SIZES AS REQUIRED** - Nominal 12 to 60 inches, 3" increments in width standard, custom widths available and 1" increments in height

**FEATURES**

- + Virtually no adverse effects on fan performance
- + Low leakage when closed allowing non operating fan to come to a complete stop, Leakage is AMCA class II or better, temperature limits -50 F to +250 F
- + Capable of high static pressures up to 12"
- + Little to no adverse acoustical impact
- + Uses recirculating air to close, does not rely on gravity
- + 833 sizes available, see application cut sheet
- + Extremely strong light weight construction
- + 5 year warranty

