



CALF BARN VENTILATION SYSTEMS



**CRYSTAL
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WHY CRYSTAL CREEK®?

Crystal Creek® is a family-owned livestock nutrition and animal health company that has been serving the farming community since 1997. We provide high quality livestock minerals, nutritional supplements, and animal health aids, along with consulting services from a knowledgeable and friendly staff. In 2015, Crystal Creek® patented a revolutionary ventilation technology, giving calf raisers the world's first four season ventilation tube...FLIP DUCT®.

Since then, Crystal Creek® has continued to improve ventilation designs with the release of the FLAP DUCT®; an automated ventilation system that makes it easy to control the calf's climate during seasonal weather changes. The patented Deflector Shield™ provides air speed and flow direction management, providing calf raisers with yet another groundbreaking ventilation technology.





Dr. Ryan Leiterman

Dr. Ryan Leiterman is the Director of Technical Services for Crystal Creek®, where he is responsible for managing the ventilation department, as well as R&D and product innovation. He holds degrees in both Agricultural Engineering and Veterinary Medicine. During his time in veterinary practice, Dr. Leiterman combined his engineering interests with his passion for calf raising to help address the air quality issues he experienced in barns. His airflow control advancements have resulted in numerous domestic and international patents.

The Crystal Creek® ventilation team is made up of friendly, knowledgeable professionals who are passionate about helping calf raisers. They have designed systems for various climates and barn configurations around the world.



We Are Passionate About Ventilation!

The ventilation team at Crystal Creek® is passionate about creating the right ventilation system for your calf barn. We work with you to create a customized solution, specific to your unique barn layout.

Scan QR Code to
learn what makes
FLAP DUCT® the right
solution for your barn.



FLAP DUCT® works with group pens and individual pens

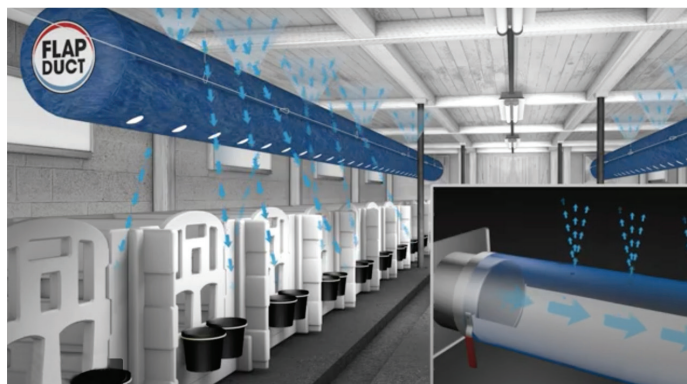
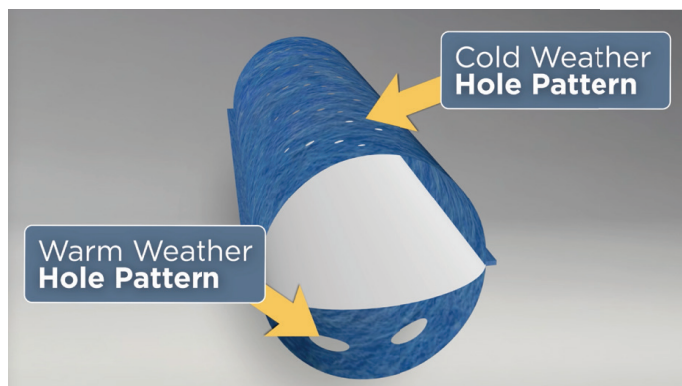
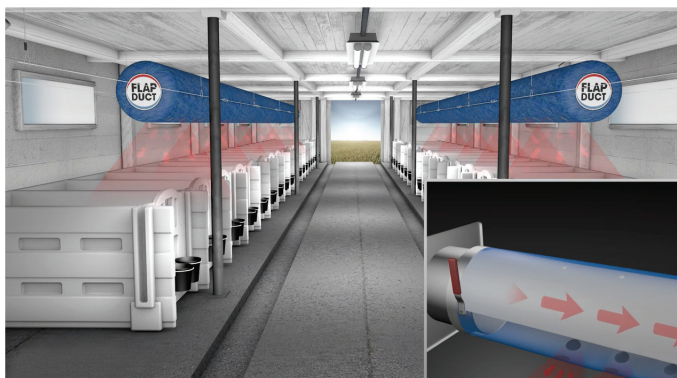
How Works:

FLAP DUCT® is the only true four season ventilation system on the market. Its patented system features an inner membrane that can be adjusted to select between cold weather and warm weather hole patterns.

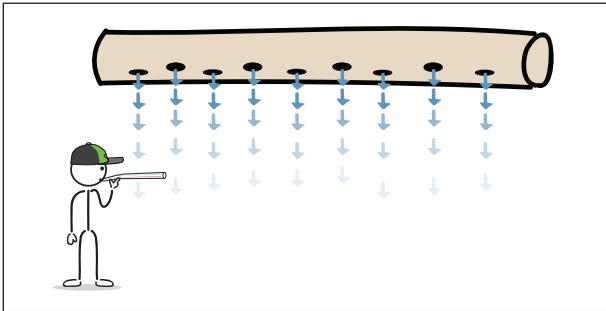
The automated lever at the fan shroud adjusts the start of the inner membrane either against the top or bottom of the tube while the air pressure from the fan will force the rest of the light-weight membrane to the chosen side.

Thanks to this innovative system, producers can effectively ventilate their calf barns in all seasons with one tube system and switch between warm weather and cold weather settings.

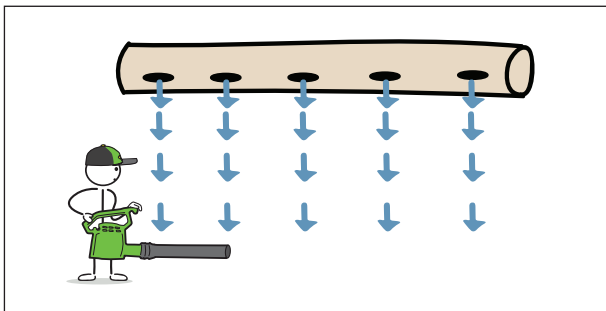
Scan the QR Code and watch an animated video to learn how FLAP DUCT® works.



Hole Size Determines Air Speed



Small holes produce weak, “thready” jets of air that quickly lose momentum, much like air blown through a small-diameter straw. This results in slow, gentle air reaching the calves. Small diameter holes in a ventilation duct are ideal for cold weather use.



Large holes produce robust jets of air with more momentum, much like a leaf blower with a large-diameter nozzle, delivering fast, cooling air over longer distances. Large diameter holes in a ventilation duct are ideal for warm weather use.

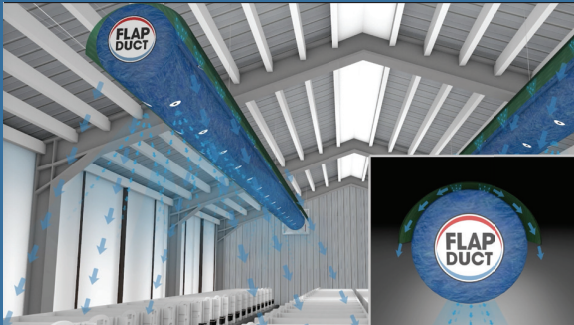


Scan this QR Code to view a short, educational video that introduces the basic principles of calf barn ventilation.



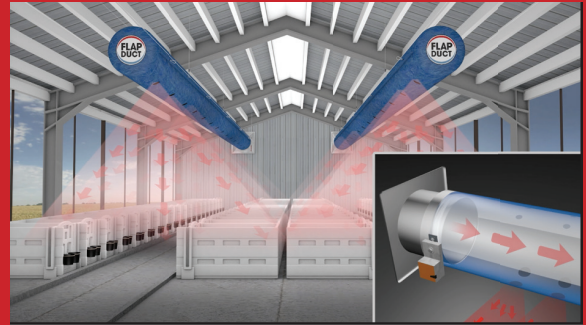
Proper calf barn ventilation is more than just having fans in the barn. Crystal Creek® has the equipment and expertise to bring creative, effective calf barn ventilation solutions to any calf raising operation.

Winter Ventilation



In cold weather the adjustable membrane of the FLAP DUCT® is moved to lay flush with the bottom of the tube. This setting lets the fan push the air through the smaller holes of the winter pattern and therefore deliver a high volume of slow, non-drafty fresh air to the calves. The Deflector Shield™ helps to guide the air downwards. Learn more about the Deflector Shield™ on page 12.

Summer Ventilation



In warm weather the adjustable membrane of the FLAP DUCT® is moved to be flush with the top of the tube. This opens the summer holes on the bottom of the tube and 100% of the fan's output will be pushed out of the larger holes, allowing a high volume of fast, cooling air to stream down onto the calves.

Commonly Asked Questions

? How do these systems work?

FLAP DUCT® systems use a fan located at the end of the barn to deliver fresh outside air along a heavy duty fabric tube. The tube carries fresh air the length of the barn and discharges it through holes located above each pen. Tubes can be custom designed to each barn's unique pen layout.

? What are these FLAP DUCT® tubes made of?

Two materials are available based on the application required. Most commonly, the tube is made of a durable, rip stop high-density polyethylene. If the tube will be exposed to direct sunlight, a vinyl material is available.

? What distance and width can a single FLAP DUCT® tube cover?

Experience has shown an operating length of 200 feet for a single fan system is possible. Longer runs can be accomplished but will require specialized fan equipment and advanced design considerations. In most situations, a tube can ventilate a width of 20-25 feet.

? Won't this added ventilation make it too cold in the winter?

Great care is taken in the design of each ventilation system to ensure that fresh air is delivered to the calf WITHOUT CREATING A DRAFT in cold weather. A properly designed ventilation system delivers a blanket of fresh air that gently settles over each calf. The use of variable speed fans and the internal membrane technology found in FLAP DUCT® offer unmatched air speed control.

? I have fans in my calf barn already, isn't that enough?

Having fans in a barn does not mean the calf pens are adequately ventilated. Often the air inside the calf pen is poorly ventilated despite having numerous fans throughout the barn.

? Are these systems easy to install?

Yes! The FLAP DUCT® system comes complete with everything necessary for installation. (For installation instructions please see page 14 of this brochure)

Can Calves Have “Too Much” Fresh Air?

Simply put, the answer is no.

There is a belief throughout the dairy industry that if the volume of fresh air brought into a barn is increased, it will create a draft on the calves. However, this is not always the case. FLAP DUCT® systems allow calf raisers a simple way to provide slow, non-drafty air during cold weather, while maintaining higher fresh air volumes.

The recommendation of four air exchanges per hour during cold weather is based off one research trial conducted at the University of Minnesota in 1977. That's over 45 years ago! The dairy industry is now realizing that the recommendation of four air exchanges per hour is outdated and inadequate.

If calves raised in outdoor hutches have an unlimited volume of fresh air to breathe in the winter, why is the dairy industry limiting our calf barns to only four air exchanges per hour during cold weather?

Calf raisers are finding cold weather ventilation success with FLAP DUCT® systems that deliver non-drafty fresh air at exchange rates greater than four times per hour. After all, hutch raised calves have shown for decades that in the absence of a draft, there is no such thing as “too much” fresh air.



Studies show that pre-weaned calves raised in outdoor hutches have significantly lower pneumonia rates when compared to calves raised in barns. Do these calves have “too much” fresh air to breathe?

Scan this QR Code to read Dr. Leiterman's article on winter ventilation..



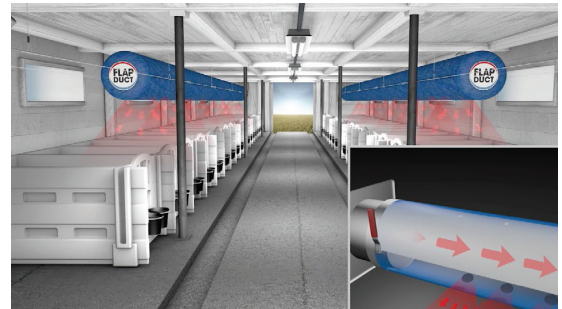
FLAP DUCT® Works in All Barn Styles

RETROFITTED STANCHION BARN

*FLAP DUCT's **airtight membrane** is an ideal solution for this type of calf housing, as it can direct and control the fresh air exiting the duct based on seasonal need.*

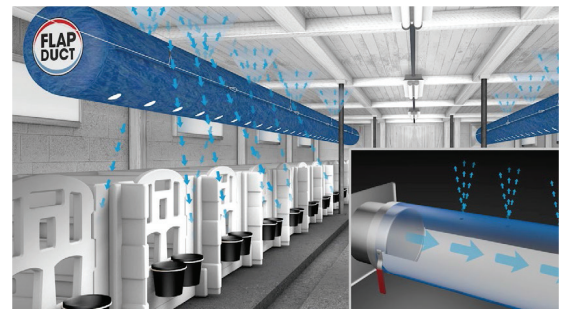
WARM WEATHER

In warm weather, turn the variable speed fan to high, increasing airflow and position the internal membrane to the top of the duct using the lever control mechanism. Air from the fan will force the airtight internal membrane to the top of the duct, blocking the holes on the top and forcing air through the series of large-diameter holes at the bottom of the duct... showering calves with high-speed, cooling air; blowing away annoying flies and keeping bedding dry.



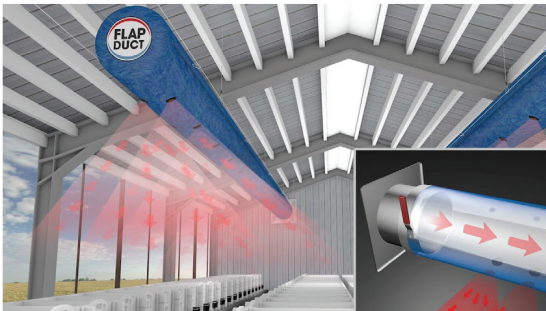
COLD WEATHER

In cold weather, use the lever control mechanism to position the airtight internal membrane to the bottom of the duct, blocking the large-diameter holes. This diverts the fresh air away from the calves through multiple small holes in the top of the duct, causing it to deflect off the ceiling and gently fall into the calf pen.



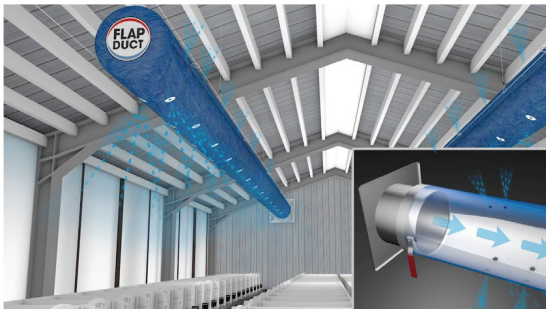
CURTAIN SIDEWALL BARN

*In naturally ventilated barns with curtain sidewalls, FLAP DUCT's **perforated membrane** allows for quick and easy changing between cold weather and warm weather ventilation systems.*



WARM WEATHER

During warm weather, the variable speed fan is set to high and the internal membrane is in the up position, allowing the large-diameter holes in the bottom of the duct to discharge fast air onto the calves. Being able to rapidly switch between a cold weather and warm weather system, with just the flick of a lever, is particularly useful in the spring and fall when the nights are cold and the days are warm.



COLD WEATHER

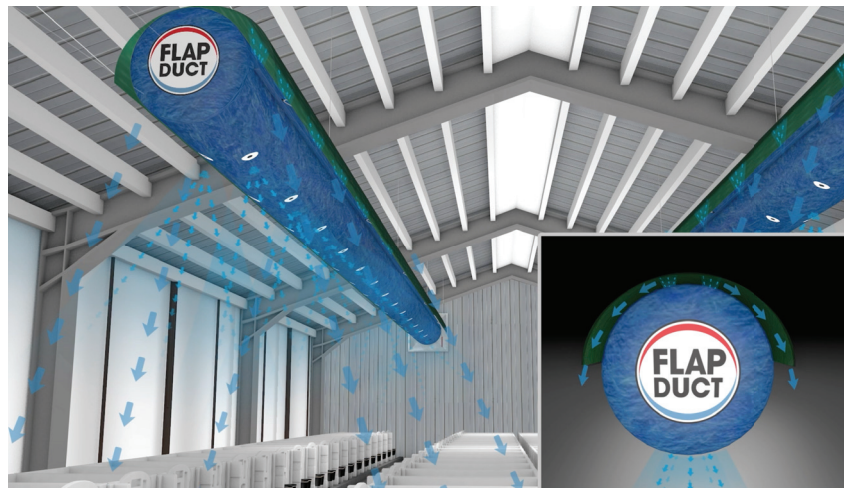
During cold weather, the internal membrane is in the down position, overlapping the large-diameter, exterior holes with the smaller holes in the membrane, creating weak, thready air jets that deliver slow, non-drafty air to the calves.

Deflector Shield™

The patented Deflector Shield™ is designed to increase the versatility of ventilation systems in barns with high ceilings or open-style rafters. The Deflector Shield™ is a tarp-like sheet that is manufactured specifically for each tube. It clips onto the tube's suspension cables and rides on top of the tube. In the winter setting, air pressure lifts the Deflector Shield™ from the tube while it gently redirects the air down, towards the calves.

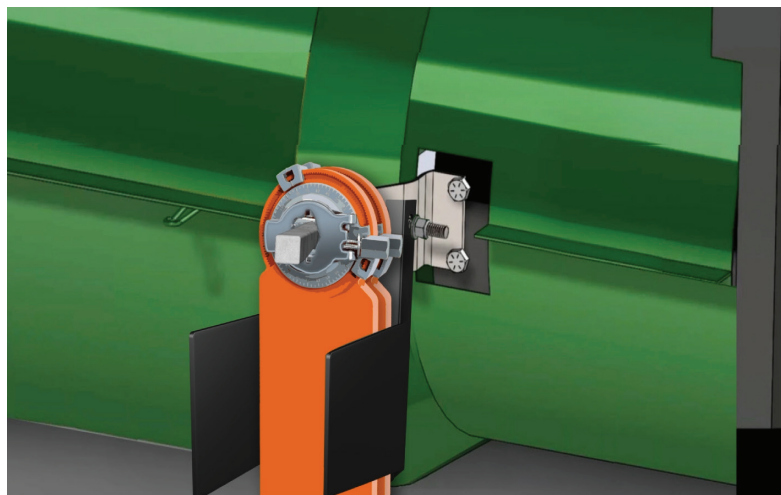
It is a must for any open rafter-style barn!

Deflector Shield™



Automation Kit

The optional automation kit for the FLAP DUCT® adjusts the position of the internal membrane based on the temperature in the barn. This allows the air speed at calf level to be changed automatically. This feature is especially helpful in the spring and fall, when temperatures swing from cold nights to warm days.

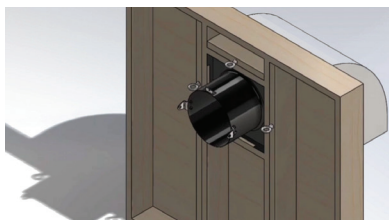


The automation kit ensures the air speed at the calf level is always correct, no matter the time of day or temperature in the barn. You'll never worry about forgetting to adjust the internal membrane position when you have the automation kit installed.

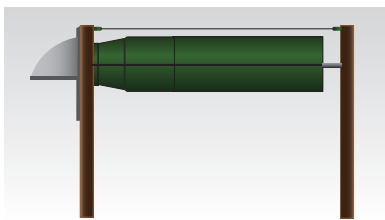
How to Install FLAP DUCT®

FLAP DUCT® ventilation systems are easy to install and most producers do it themselves. The system ships as a complete kit and can typically be installed in a day or two.

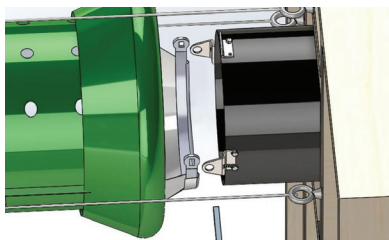
Crystal Creek® provides a printable step-by-step installation manual, an animated video, wiring charts, and remote troubleshooting by our ventilation team.



1) Install fan in outside wall and string suspension cables



2) Hang tube on cables



3) Install Lever Arm and Rod and connect tube to fan



4) Install Automation Kit with Actuator and wire Thermostat

INSTALLATION GUIDE



Scan the QR Code to watch the animated installation video or get the printable step-by-step-instruction manual in either English or Spanish.



Ventilation Resources

Videos by Crystal Creek®



Scan the QR Code to find our Ventilation Video Playlist.

Articles by Crystal Creek®

- Barn Design Ideas & Tips
- Remodeling Calf Barns
- 3 Common Calf Barn Ventilation Questions Answered
- Comparing Calves to Bicycle Wheels- A Systematic Approach to Troubleshooting Pre-weaned Calves
- Four Air Exchanges Per Hour: A History of Calf Barn Ventilation and an Industry That Is Slow to Change
- ROI of Calf Barn Ventilation
- Drafts: A Calf's Best Friend or Greatest Foe?



Scan the QR Code to find our Ventilation Articles.



Scan the QR Code to find our company's website and more information.



Crystal Creek® offers a full line of calf care products and calf barn ventilation services. Call our toll free number or visit our website to learn more.



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