



- Can and Bottle Drying Systems
- Pre-Shrink Sleeve Bottle Drying
- Under Cap Drying Systems
- Case Drying Systems
- HEPA Air Rinsers
- Vacuum Pumps for Case Pack and Carton Erecting
- Vacuum Pumps and Blowers for Bladder Presses
- Air and Oil Filter Assemblies

## Can and Bottle Lines

You have just waxed your car and it rains. You decide to dry the car by driving fast, really fast. At first nothing happens, the drops remain stuck to the car. You drive faster and faster. Finally the air velocity pushes the drops together until they create a drop so heavy it flies off the car.

That's it, that's what we do: air knife drying.

Ray Ralph, President  
R.E. Morrison Equipment Inc.



# New Solutions to Packaging Challenges

North-American manufacturers of packaged finished products are world innovators in technology, style, and design. In a competitive global marketplace, Canadian products sell because of the production decisions that place them ahead of other similar products on the shelves. When consumer interest and loyalty depend on package appearance, poor quality is not an option.

The Adamark Air Knife Drying Systems are customized to ensure that they will solve even the most complex and demanding drying problems. Through a joint research venture with a major Ontario university, Adamark engineers have become experts on the science of air knife drying, giving them the skills to make Adamark work for you. The Adamark system's continued success in the packaging industry has made it a factory-installed accessory for companies like Krones, Priority One, Descon and many others. Whether your issue involves cans, glass containers or PET bottles, the Adamark System is custom engineered to meet your packaging requirements.

## What is an Air Knife?

An air knife is a device that channels air through a uniform slot at high velocity (27,000 - 39,000 FPM).

## How Does it Work?

Pressure is created by forcing more air into the knife than can exit through the slot. It is the relationship between the slot width, pressure and volume generated by the blower that creates the key to a dry product: velocity. The high volume of a centrifugal blower allows the Adamark system to produce more velocity, and better drying, than compressed air alternatives.

## Why Use Air Knives?

Air Knives are used to remove water droplets and film from a filled container to ensure that:

- > Labels can be applied straight without wrinkles, bubbles, or water marks.
- > Cases do not rot due to water being absorbed into the folding carton or corrugated box.
- > Graphics on the boxes are not damaged from water rings.
- > Sleeve labels slip easily over bottles and cans and can be shrunk without blow out marks.
- > Bright cans do not rust.
- > Glue costs remain minimal with no 'glue pot' water contamination.
- > Ink -jet codes are legible and not erasable.



## The Adamark Advantage

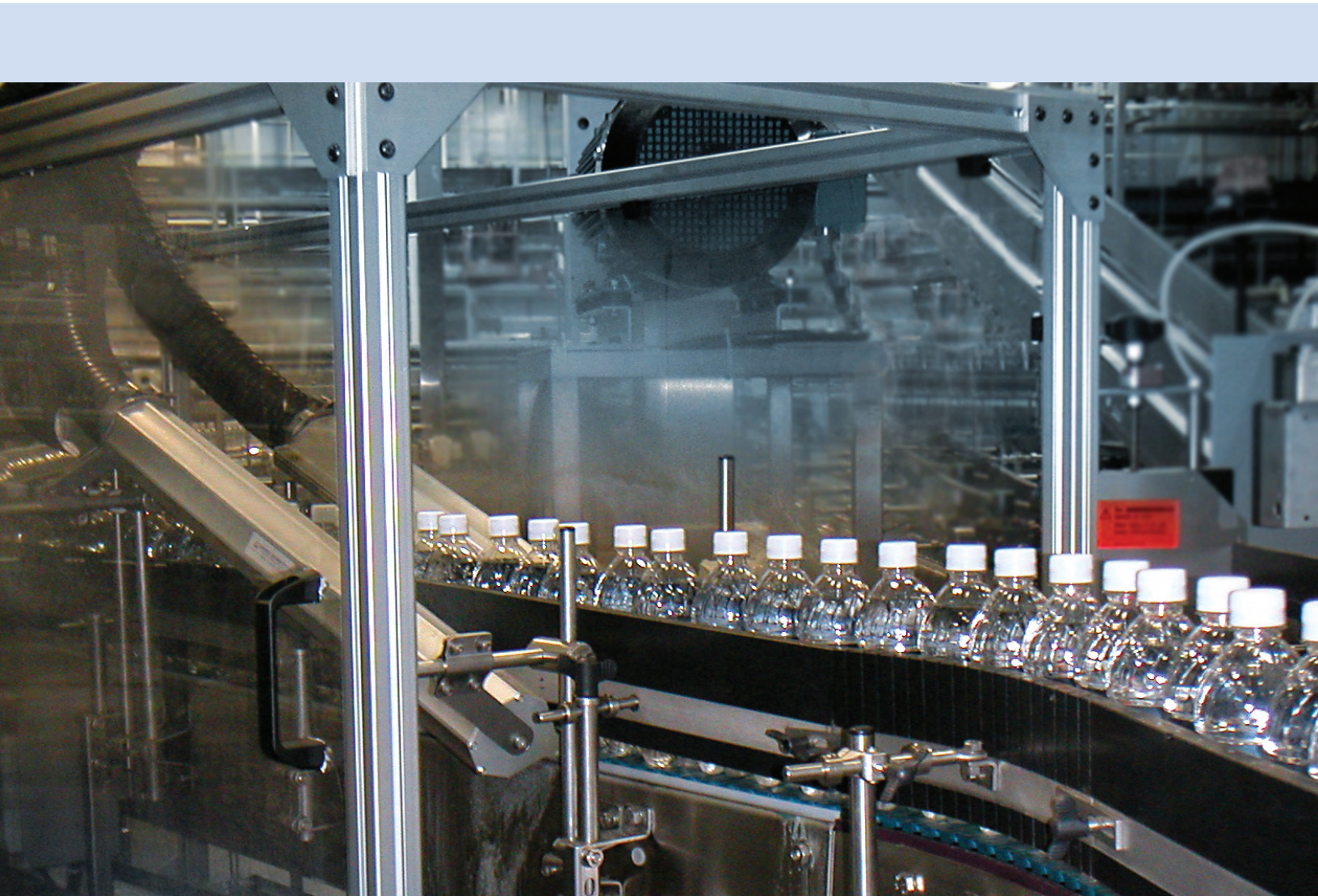
The Adamark Air Knife System's medium volume, low pressure design produces velocities equal to compressed air at a fraction of the operating cost. In fact, energy savings associated with the transition from compressed air to an Adamark system can result in a return-on-investment of 100% in 8-10 months.

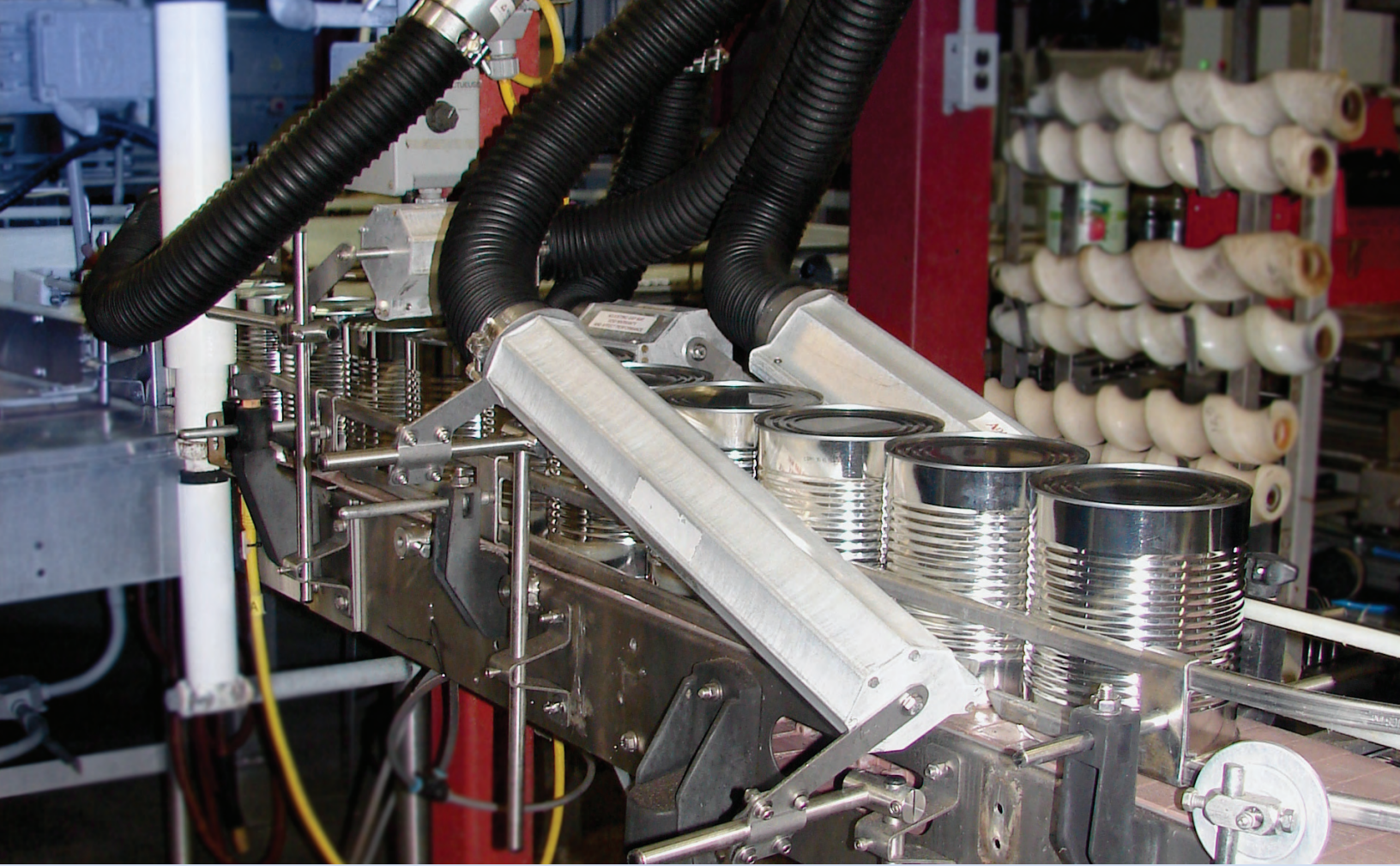
In evaluating air knife systems, thought must be given to the low pressure, low velocity systems available. Typical low pressure systems utilize large air volumes (1000 SCFM and larger) at pressures less than 1 PSIG. At less than 1 PSIG the air is simply not moving fast enough to effectively remove water droplets. The Adamark system uses a compact blower producing high velocity air at pressures up to 4 PSI creating a knife-like air stream stripping liquids from any surface.

# PET Bottle Drying

Plastic bottles, whether round, square or contoured, code better, label better and look better when the gross water and rinse liquids are removed with air knife drying. Condensation often forms on bottles after filling resulting in poor labels and codes. The Adamark Air Knife Drying System can keep the bottle condensation free for up to 10 seconds after the drying station. This means a dry bottle is coded and labeled resulting in a perfect product every time.

The Adamark high speed single stage centrifugal blower is capable of delivering warm, dry, high velocity air to your product from up to 75 feet away from the finish drying area. This is ideal in applications when two or more labelers are used. By producing high velocity, high temperature air at the lowest possible flow, the Adamark system creates very little ambient turbulence so it can be positioned within 18" of the coder. Regardless of your specific needs, an Adamark System can be customized to solve your PET bottle labeling and coding needs.

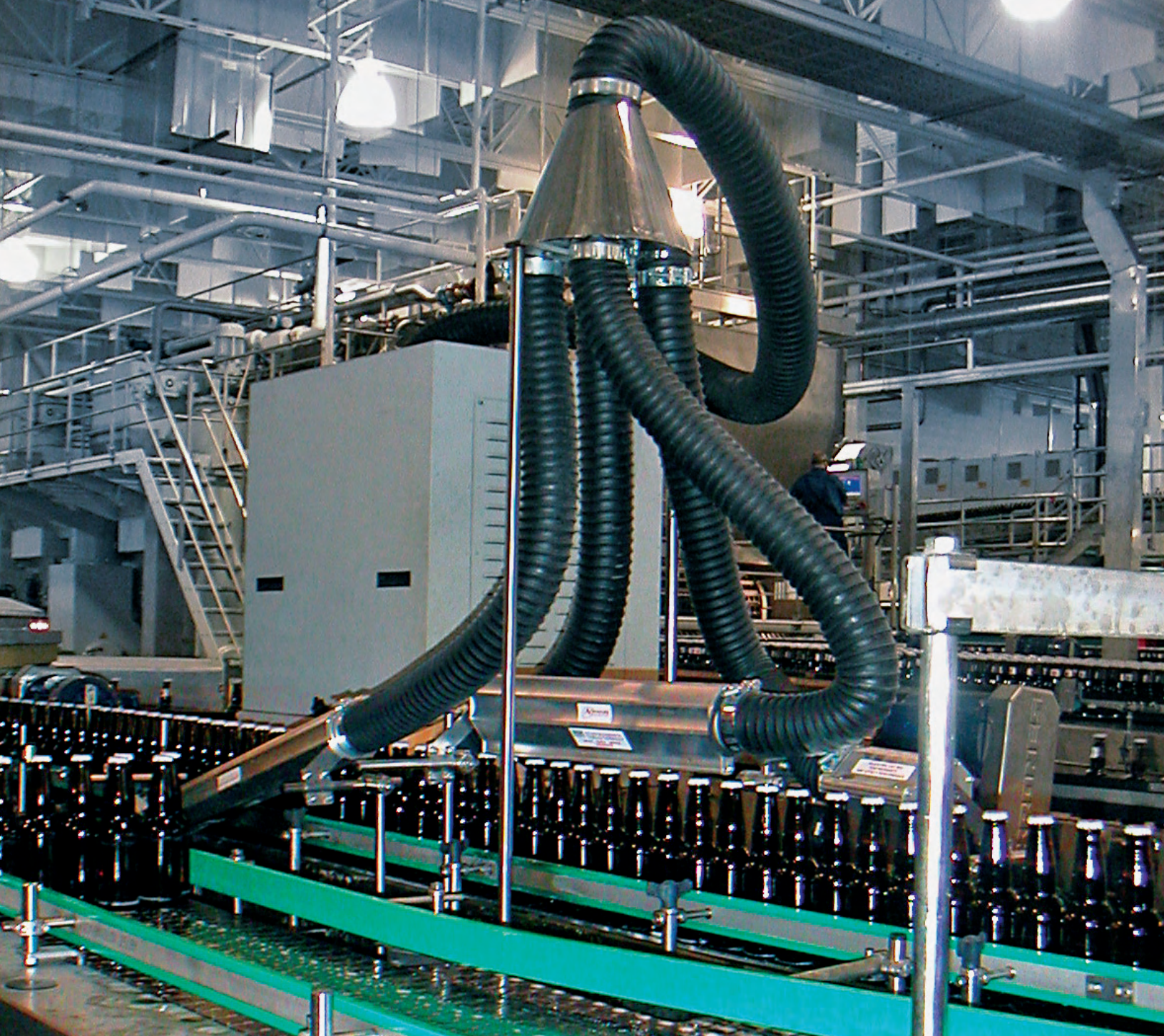




## Can Drying

Even though they do not require labels, it is very important to dry cans after filling and washing to ensure the finished product is free of water marks and stains. With prolonged exposure to water, rust and corrosion can form on the seams and pull tab area. The Adamark Air Knife Drying System removes all gross excess water to ensure a clean, sanitary product ends up on the shelves.

The relatively new industry ink jet code requirements have created a space problem, which makes it necessary to dry the dome in areas removed from the finish drying area. In some cases, the dome must be completely dry to accept a code at high line speeds (up to 1200 CPM) and have the coded product enter a warmer afterward. The Adamark Air Knife Drying System is critical to ensure not only gross water removal but the elimination of condensation as well. The Adamark blower will produce pressures of 70" H<sub>2</sub>O at temperatures 60-70° F over ambient with a velocity between 32,000 and 37,000 FPM. In response to challenge, the Adamark system has been successful by changing the skin temperature of the can long enough for the code to be applied and dry. The Adamark Air Knife Drying System allows for less expensive inks and increased line speeds, letting you produce a better looking product even when labels are not involved.

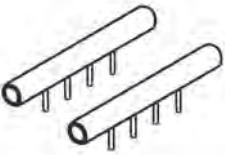
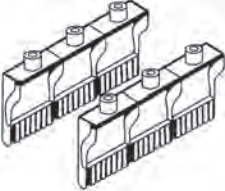
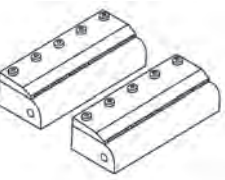
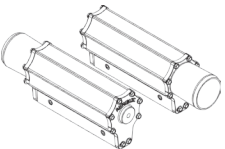


## Distribution Air Manifolds

The Adamark Air Knife Drying System uses a custom manufactured distribution air manifold with all its multi-stage systems to ensure minimal pressure drop in the air transport system. A design pressure of 60" H<sub>2</sub>O should result in a minimum drying pressure in the three stage system of 40"-50" H<sub>2</sub>O. Our specialized manifolds allow the Adamark system to be expanded to meet the needs of even the most complex application.

# Adamark: Compressing Costs

Sometimes costs can be deceiving, short term savings often result in long term maintenance and operating costs. Compressed air provides huge savings in the short run, but costs build very quickly with large production volume. In fact, when running three shifts, blow-off nozzles powered by compressed air become more expensive than the equivalent Adamark system after only 3 months. The Adamark system's high velocity, low pressure approach can produce a drier product than compressed air using only a fraction of the horsepower. What does this mean? Simply put, Adamark saves you money.

	Drying System Type.	Annual Operating Cost		
		Single Shift	Double Shift	Triple Shift
	<p><b>Blow-off Nozzles to cover two 6" wide areas.</b>            Each of the eight (8) nozzles had a 5/32" diameter bore and consumed 23.8 SCFM each at 75 PSIG for a total of 190.4 SCFM            42 HP required            Approximate initial investment: \$150.00</p>	\$9,187	\$17,170	\$25,153
	<p><b>Flat Jets or Whisper Blast Nozzles to cover two 6" wide areas.</b>            Each of the six (6) flat jets had an air consumption of 20 SCFM at 75 PSIG for a total of 120 SCFM.            26 HP required            Approximate initial investment: \$250.00</p>	\$5,790	\$10,822	\$15,853
	<p><b>Transvector-Type Air Knives to cover two 6" wide areas.</b>            Two air knives each with a length of 6 inches had an air consumption of 4 SCFM per linear inch at 75 PSIG for a total of 48 SCFM.            10.7 HP required            Approximate initial investment: \$550.00</p>	\$2,316	\$4,329	\$6,341
	<p><b>High Velocity Adamark Air Knife System.</b>            Two air knives each with a length of 6 inches had an air consumption of 10 SCFM per inch with 0.040" air knife gap at 70" H<sub>2</sub>O pressure (2.5 PSI).            3 HP required            Approximate initial investment: \$5,800.00</p>	\$404	\$807	\$1,211



# Other Adamark Applications

## Air Rinsing and Drying Prior to Filling

Adamark Air Knife Systems are used to remove dust and debris from the inside of a container prior to filling. The system uses a HEPA in-line filter to ensure only clean, particle and bacteria free air is making contact with the product. Haug high quality anti-static bars are used to remove the static charge allowing dust to disperse freely. If airborne particles are an issue, a closed loop system is available. This configuration uses the blower inlet as a vacuum to exhaust air from the cleaning area via precision nozzles. Inexpensive, easy to clean filters are mounted in-line to filter exhaust air.

## Drying at the Pasteurizer or Warmer

The exit from the warmer can be anywhere from 24 inches to 20 feet wide. When a wider conveyor exiting the warmer narrows to send the product along a narrower transport conveyor water buildup often occurs. The Adamark Air Knife System can prevent this buildup after the pasteurizer by clearing the product and conveyor of excess water. The advantage here is not only a drier product entering down-line finish drying systems, but a drier, cleaner conveyor requiring less long term maintenance.

## Case Drying

A dry case has two advantages beyond its appearance. First, it travels faster without changing its orientation on a belt conveyor. Second, it eliminates water from the final shrink wrap. The benefit of each is clear. The case is dried in 3 stages similar to our can and bottle lines. First the top and bottom are dried simultaneously. Then, the sides are dried, and finally the top is dried a second time to ensure no excess water is left on the product or case. This system is very effective, removing 75%-85% of gross visible water. Normally, line vibration and evaporation is enough to dry the remaining 15% before the containers are packaged for shipping.

# Beyond Air Knives

## Becker Vacuum Pumps and Blowers

The R.E. Morrison network of solutions extends beyond air knife drying. Our vacuum pumps and blowers can be used in many other areas of a canning or bottling process. Becker vacuum pumps use advanced rotary vane technology and are sold in both oil-free and oil-lubricated forms. Our pumps and compressors are ideal for use in the following areas:

- > Vacuum lifting
- > Wine grape crushing
- > Label application
- > Vacuum filling
- > Carton erecting
- > Case packing
- > Water purification
- > Ejection of substandard bottles



# The REM Network

[www.remequip.com/network](http://www.remequip.com/network)

R.E. Morrison Equipment is an industry leading manufacturer and distributor of a wide variety of proprietary and non-proprietary vacuum and drying technologies. The REM Network is the gateway between all our content, from technical specifications to the details on distribution partners and suppliers.

## R.E. Morrison Equipment

[www.remequip.com](http://www.remequip.com)

The logo for REM Equipment features the word "REM" in a large, bold, blue serif font, with "EQUIPMENT" in a smaller, blue sans-serif font directly below it. The text is set against a white background with a thin blue border.

As the Canadian Master Distributor for Becker Vacuum Pumps, Republic Blower Systems and Mann Industrial Filters, R.E. Morrison has been providing solutions to Canadian customers for over 20 years. Our new 10,000 sq. foot Mississauga headquarters serves as the base for the REM Network, including all Adamark and BaseVac Dental related activities. By combining European precision with North American practices, REM has a custom designed, economical and high quality solution for every application.

## Adamark Air Knife Systems

[www.adamarkairknife.com](http://www.adamarkairknife.com)



The Adamark and Adamark II Air Knife Systems are the first choice of many of Canada's largest manufacturers for one simple reason: they are guaranteed to work. Our expert systems engineers have created bolt-on and drop-in solutions for many different product and conveyor drying and belt cleaning applications. Every system is custom designed from the ground up based on your application to ensure it meets your requirements

## BaseVac Dental Systems

[www.basevacdental.com](http://www.basevacdental.com)

The logo for BaseVac features the word "Base" in a bold, red, sans-serif font, with "VAC" in a blue, sans-serif font below it. The text is set against a white background with a thin blue border.

In 2004, the BaseVac Dental line of dental vacuum products was born. Based on a complete understanding of dry vacuum pumps used in industrial applications, the BaseVac Dental line was immediately recognized as the correct dental vacuum solution. The BaseVac Dental Dry Vac system is 100% dry, easy to maintain, and fits in a closet. In spite of its compact package, the Base Vac Dental Dry Vac is capable of supporting up to 12 operatories in standard configurations and a virtually unlimited number in a custom designed system.

## Ribbit Enterprises

[www.ribbitenterprises.com](http://www.ribbitenterprises.com)



Ribbit Enterprises is R.E. Morrison's American distributor for Adamark Air Knife Systems and BaseVac Dental vacuum systems. Ribbit operates out of REM's Mississauga head office and offers the same level of customer service and product support REM customers have come to expect. Dealer inquiries welcome.

## R.E. Morrison Equipment Inc.

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