

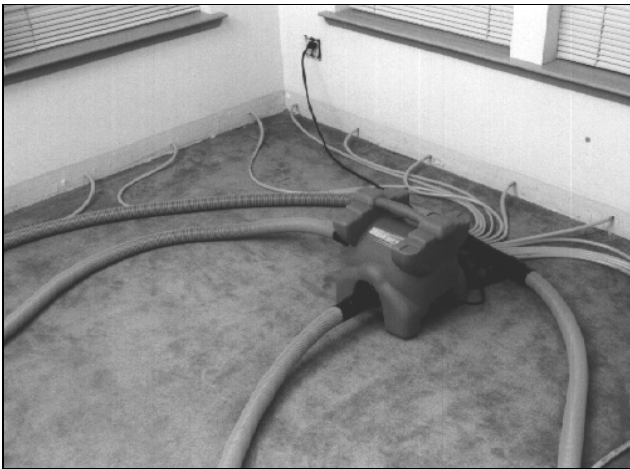
DRI-EAZ

DRIFORCE USER'S GUIDE

Congratulations on your selection of a DriForce InterAir Drying System from Dri-Eaz Products Inc.

It is our goal to offer you the best high performance drying system available.

We invite your written appraisal and suggestions for improvements.



The DriForce is designed to speed the drying time of structural cavities – the internal spaces created by various construction methods that sometimes trap unwanted moisture. By pulling moist air out of such spaces, or pushing warm and dry air into them, the DriForce system helps dry structural materials with savings in time and money.

**This guide contains important operating information.
Please read before using the machine, and save for future reference.**

PURCHASE DATE: _____ **SERIAL NO.:** _____

DEALER: _____

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INTRODUCTION

The DriForce is an equipment system used in water damage restoration and restorative drying work. It is specifically designed for structural cavities like those between studs in walls, under and behind cabinets and other built-ins, between joists in floors and ceilings, above door and window headers, and many other areas that are difficult to access.

The system works because airflow across wet materials is a basic principle of drying. The DriForce will dry materials in either the injection mode (pushing dry air into wall cavities) or in the extraction mode (vacuuming moist air out of wall cavities) to maximize both drying speed and environmental considerations.

The DriForce blower has a stainless steel base and a double-wall polyethylene housing. It is connected to an Air Delivery System (ADS) made of flexible, crushproof polyethylene hose which is high-temperature resistant and cautioned-colored for visibility. The ADS is ended at any manifold by plugging it with a supplied end cap. The ADS attaches to manifolds with convenient slip-on hose cuffs. Up to 12 supply tubes are connected to each manifold, and lead to air nozzles that complete the air-delivery system.

The injection-moulded plastic air nozzles have a tapered design to improve air delivery and create a tight seal. Fins on each side of the air nozzle allow locking in place with a quarter turn, which is especially important when drying ceilings.

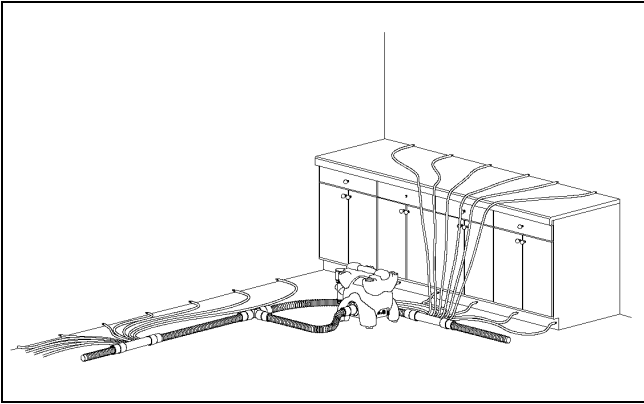
Three advantages of the DriForce are minimal damage, high coverage, and great versatility. The air nozzles create minimal damage because they need only small holes for installation, less than 5 mm, making them easy to hide or repair. The system is high-coverage, providing everything you need to treat over 28 meters of stud-constructed wall. It is versatile because it can dry many combinations of walls, cabinets, ceilings, headers, etc., in either the injection or extraction mode.

While supplying the high volume and high pressure of air this technology demands, the DriForce uses quite a small draw of electrical power (less than 5 amps maximum, and less during normal operation). The blower unit itself is easy to carry because of its light weight, about half that of a TurboDryer.

PRINCIPLES OF DRYING

Moisture trapped in and behind building materials can result in extensive damage, and also can raise health and safety concerns such as respiratory illness associated with mould and mildew.

Whether excessive moisture is present or not, and where it is located, should be determined by using professional moisture-detection equipment such as penetrating and non-penetrating moisture meters, and thermo-hygrometers that measure the amount of moisture present in the air as water vapour. Keeping moisture and humidity records is essential to provide an accurate job history for the customer.



The DriForce will deliver air to structural cavities in walls, ceilings, under and above cabinets, and many other areas.

The science of drying structures depends on removing moisture that is potentially harmful. One basic principle is that airflow speeds up the rate of evaporation. Creating air movement in any problem areas will tend to speed evaporation and reduce the potential for problems. (This is especially true when air is held stagnant within structural cavities.) A second principle of drying is to dehumidify the air in the area being dried. A third is to add heat, as practical.

The DriForce employs all three of these drying principles. Air is pushed or pulled through air nozzles, either into or out of structural cavities. In both cases, air movement in the cavities speeds up the drying process. Dehumidification can be improved, when forcing air into cavities,

by making sure that the air entering the DriForce is as dry as possible, usually by using a refrigerant or desiccant dehumidifier. Finally, heat generated by the DriForce blower motor enters the airflow through the ADS, increasing the temperature of the air it provides for drying.

OPERATING INSTRUCTIONS

Tools

Tools you will need are: pencil, tape measure, razor knife, drywall taping knife, small pry bar, nail puller, screw driver, a carpet awl for creating holes, and sometimes a drill with a 4 to 5 mm bit.

Wall Preparation

In most cases of wet walls, remove skirting board or cove moulding. First, use a razor knife to score along the top of the skirting board or cove moulding where it meets the wall, to reduce damage to painted surfaces and make a professional re-installation easier. When prying skirting board away from the wall, protect the wall surface by inserting a drywall knife between the pry bar and the wall. Pull remaining nails out of the wall, or through the back of the skirting board. Write a number on the wall and the corresponding board so you will know where to reapply it.

Starting from an inside or outside corner of the wall, make a mark at about the center of a stud cavity. Now move a tape measure to that mark, and mark the wall at each stud cavity center. An electronic Stud Finder is a very helpful tool when doing this, and is available at most hardware and home centers. The goal is to provide at least one hole into each structural cavity. Larger cavities, and those with more soaking, will benefit from one or more additional holes.

Making Holes

Now make holes for air nozzles at each mark, usually just over the sill plate, but below the line indicating the top of the skirting board. The easiest way is to punch holes with a carpet awl. You can also use a drill with a 4 to 5 mm bit. A larger hole would be more time-consuming to patch, and would somewhat decrease efficiency by leaking air.

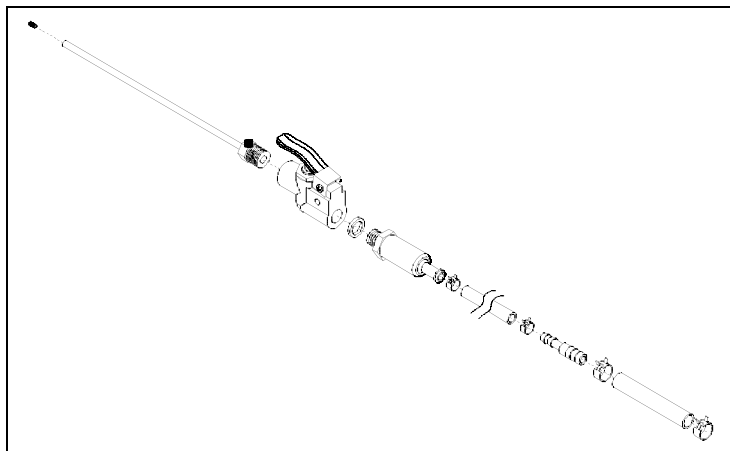
In cases of rubber cove moulding or elaborate skirting boards, it may be best to drill above them, and

When making holes into cavities like those in cabinets, headers, and ceilings, think ahead about reducing your repair later on. For example, when drying behind cove moulding, sometimes you may be able to peel down the cove moulding at the center of each stud cavity, just enough to insert the air nozzle. The small area were peeled can be re-glued, saving complete replacement of the moulding.

Steel Studs

Steel studs are common in commercial buildings. They are set in a channel that can hold large volumes of water. To access these areas, open holes in the plaster board to inspect, and if needed extract the water using a thin wand from a wet-dry vacuum or your extraction equipment. Do this before attempting to dry with a DriForce. Do NOT use the DriForce to try to extract standing water of any kind.

Odor and Mould Control



The MicroMist wand uses the same holes made for the DriForce air nozzles to spray Milgo or Milgo-SR directly into a structural cavity. The MicroMist is an available accessory for the DriForce.

For problems from odors associated with mould and mildew, use a MicroMist to apply a properly diluted product such as Milgo or Milgo-SR to the inside of the wall. Used with any pump sprayer, the MicroMist wand slips into the same hole used for the air nozzle, and can be used to saturate approximately the bottom two feet of a wall cavity.

If you suspect that mould and mildew may be growing inside cavities, follow professional mould remediation and antimicrobial safety precautions, such as those outlined in the IICRC S500 Standard for Water Damage Restoration.

DriForce Blower Setup

Set the DriForce blower in any convenient location, but out of traffic areas as much as possible, to minimize a trip-and-fall hazard from the blower and the ADS.

Use the muffler-filter when the DriForce in the air injection mode. This will reduce blower noise substantially, and also filter out large particles from being sucked through the blower. Place the muffler-filter on the air intake connector, and place the ADS on the air outlet connector.

When using the DriForce in the air extraction mode, it is recommended not to use the muffler-filter, but to use a HEPA Filter accessory. See "Extraction Drying."

For maximum efficiency, run a short length of ADS to a T, and then approximately equal lengths of ADS in opposite directions to wet areas being treated. Two shorter lengths of ADS running from each side of a T give better airflow than one long installation in a line.

Use at least two manifolds in the air injection mode for greatest efficiency. Notice the ventilation ports on the bottom of the stainless steel base of the DriForce blower. Covering up or clogging these ventilation ports can cause the blower to run at a higher temperature which will shorten its life. Keep loose rags, fabrics, dirt, or other debris from covering or clogging the ventilation ports.

Laying Out Manifolds

Next, determine the number of manifolds needed for the job. The following procedure will give 25 to 30 air exchanges per hour in each cavity, which is effective for most situations. Use a formula of one manifold (12 air nozzles) for each 4 meters of interior or stud-framed wall. For exterior framed walls, common walls in apartments and condos, double-sheeted fire walls, and dense or water-resistant covered walls, use a formula of one manifold (12 air nozzles) for each 2 meters of wall. Wainscoted, tile-

After determining the number and distance of manifolds, set up the ADS system. Pre-assembling the manifolds, tubing and air nozzles will save considerable setup time.

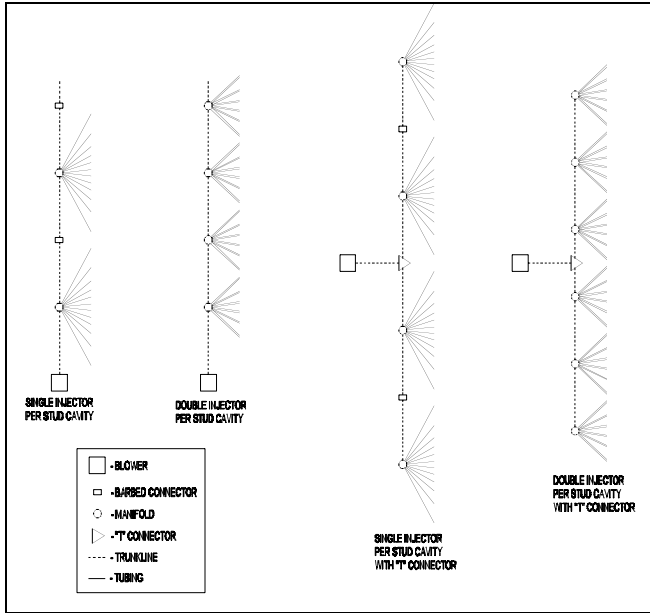


Diagram shows two inline ADS lines (left), and two double-ADS lines running from a T connector. It also shows tubing layouts for one or two air nozzles into each wall cavity.

If possible, direct air from the blower through a short section of ADS to the T-connectors, then run the ADS from both sides of the T. This will enhance performance by balancing the airflow. You can also use the T-connectors to dry in several rooms at once.

Set up FIVE manifolds with the following lengths of tubing:

Quantity	Length	Locations on Manifolds
2	250 cm	Outlets 1 and 12
2	200 cm	Outlets 2 and 11
2	150 cm	Outlets 3 and 10
2	100 cm	Outlets 4 and 9
2	70 cm	Outlets 5 and 8
2	30 cm	Outlets 6 and 7

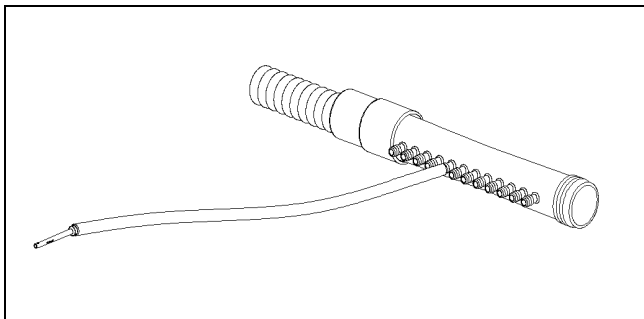
Set up the other THREE manifolds with the following lengths of tubing:

Quantity	Length	Locations on Manifolds
4	125 cm	Outlets 1, 2, 11 and 12
4	100 cm	Outlets 3, 4, 10 and 11
4	30 cm	Outlets 5, 6, 9 and 10

Laying Out Supply Tubes

Supply tube layouts will vary according to the job, especially when running air nozzles above wainscots or cabinets, into ceilings, etc.

The most versatile setup for most standard wall-drying jobs is as follows:



ADS runs from a DriForce blower and attaches with a standard hose cuff to a manifold. Thence, supply tubes run to air nozzles inserted into structural cavities.

To each outlet on a manifold, attach a length of supply tubing, and insert an air nozzle in the other end of the tubing.

Seal off the last manifold on each run of ADS with a supplied endcap plug. Now place the air nozzles into the holes you have drilled or punched.

Although not necessary in most cases, it is sometimes helpful to awl-punch or drill a small vent hole placed just above the highest moisture point on the wall. This vent hole can speed up the drying process by supplying more dry air to affected materials. The small size of the hole often allows you to patch it with little difficulty.

Standard Drying Procedure

Now you are ready to dry. Make sure you have undamaged electrical cords, plugs, extension cords if used, and circuits with 5 amps of available 230v power. Turn on the power switch, and ensure that all the ADS, Ts, hose cuffs, manifolds, supply lines, and air nozzles are properly installed with minimum air leakage.

Attach the ADS to the vacuum side of the DriForce blower unit. For the first portion of the job, it is recommended to use the system in the vacuum or extraction mode to remove the bulk of the humidity before air from structural cavities. (See "Extraction Drying") Run in the vacuum mode until the specific

humidity in the affected area of the job reads the same or lower as the specific humidity in an unaffected area of the job. Do not judge drying progress by relative humidity; use specific humidity readings of grains per pound of dry air (GPP).

After the humidity in the affected area of the job is the same or lower as that in an unaffected area, move the ADS from the vacuum to the pressure outlet of the DriForce and install the muffler-filter. You will now be forcing air at high pressure into the structural cavity, to finish the drying process.

Extraction Drying

As explained above, drying by vacuuming air from structural cavities, setting up the DriForce in the extraction mode can speed drying times. Also, using the extraction mode ensures that wet and possibly contaminated air does not get forced into previous dry and unaffected areas.

When using the DriForce in the vacuum or extraction mode, do not exhaust the air into an occupied structure. Use vacuum hose to exhaust the air to the outdoors, completely outside the structure, or use a HEPA Filter Attachment that is available as an accessory. This will ensure that contaminants (including moisture, mould spores, mould endotoxins and by-products) are not transferred from within structural cavities into an occupied area. Contaminants may create health concerns such as allergic reactions and illness.

Do not use the muffler-filter that is supplied with the DriForce in the vacuum or extraction mode. This filter is not a HEPA-grade filter, and will not meet the requirement to ensure that possible contaminants are not exhausted into an occupied area. Use the muffler-filter only in the injection or blowing mode.

CAUTION

When using the DriForce in the vacuum or extraction mode, exhaust the air to the outdoors, or pass the airflow through a HEPA filter accessory, to ensure that possible contaminants are not exhausted into an occupied area.

Drying Ceilings and Cabinets

Drying ceilings is accomplished in much the same manner as walls, and can be done at the same time as wall drying. Remember that ceiling structural cavities are usually larger than those in walls, and require more air nozzles.

Drying under and behind cabinets is often a challenge, as it is difficult to measure trapped moisture, and also difficult to access the areas with tubing and air nozzles. If your moisture measurements are unsure, it is better to assume that materials are wet. Wherever water flowed, make sure you provide flowing dry air. When necessary, remove, dry, and reset cabinets.

Supplying Extra-Dry Air

To increase drying speed when forcing air into cavities, ensure that that air going into the DriForce blower is as dry as possible. One way is to position the output airflow from a dehumidifier near the DriForce air inlet.

Even better is to attach ducting to the air output from the dehumidifier and position it near the DriForce. Attach a short piece of ADS to the air inlet of the DriForce, and slip the other end a foot or two up into the ducting from the dehumidifier. Do NOT tape up or completely seal such ducting. This would probably unbalance the airflow through the dehumidifier, and could even damage the dehumidifier.

The DriTec 150 desiccant dehumidifier design is nearly perfect for use with the DriForce. The airflow from the DriTec 150 is a close match to the airflow into the DriForce. The airflow from just one of the two process outlets from the DriTec 325 desiccant dehumidifier is also a close match, and will work very well combined with the DriForce.

Super-dry air from a DriTec can be especially helpful to speed up a drying job, or to dry difficult materials like lath and plaster, double-sheeted or fire walls, insulated walls, and walls covered with vinyl wall-paper or impermeable paint.

After drying is complete, you must fill any holes you have created. Remember that your local fire code applies to outside walls and firewalls, and you must repair up to code. Special fireproof caulks and tapes are available that can be helpful.

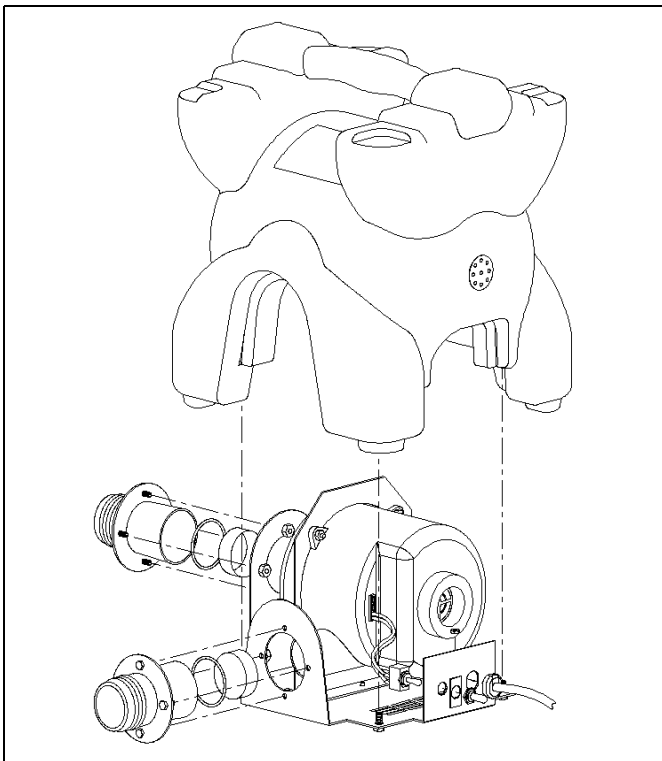
Operating Instructions Summary

The DriForce will help restore building materials in walls, ceilings, headers, cabinets, and other structural cavities to their pre-loss condition. The rapid high-volume air it delivers removes moisture that was trapped in the cavity. The DriForce will dry several difficult areas at once, such as cavities below cabinets, the walls behind the same cabinets, and the ceilings above these same cabinets or walls. The versatility of the DriForce InterAir Drying System, combined with TurboVents and Mini-TurboVents, TurboDryers, and DrizAir or DriTec dehumidifiers, all combine to form a dynamic drying team.

The DriForce InterAir Drying System from Dri-Eaz Products is versatile and easy to use. It will provide you with years of service, removing moisture from difficult-to-access areas on job after job. The DriForce will help you provide a superior restoration service to your customers by returning the property to pre-loss conditions faster, and saving the insurance company unnecessary reconstruction costs.

DANGER

Do not attempt to service or clean the DriForce while it is plugged into an electrical outlet or while the blower is operating as this may lead to risk of electrical shock or injury. It is dangerous for an unqualified individual to attempt to disassemble or repair the DriForce.



For service or repair, remove four screws that hold the stainless steel base to the polyethylene housing.

MAINTENANCE

Proper maintenance will keep your DriForce InterAir Drying System in good condition for years to come.

Check both the inlet and outlet of the DriForce unit for obstructions or debris after each use.

Inspect the muffler filter, and clean as needed by vacuuming or washing. You can further clean the filter by washing with Dri-Eaz brand Milgo or Milgo-SR, at dilution rates shown on their labels.

Check manifolds, tubing, air nozzles and other ADS components, and replace if needed.

Shine the DriForce housing and other components with a vinyl cleaner, like the one you use on the dashboard of a car.

Service parts, plus other maintenance and warranty information, are available from the Dri-Eaz Service Department. Telephone (360) 757-7776, extension 238, or fax (360) 757-6784.

SPECIFICATIONS

Dimensions (Height – Length – Depth)	35 x 35 x 30 cm	14 x 14 x 12 inches
Total System Airflow (maximum)	2.3 cmm (cubic meters per minute) 170 cubic meters per hour	100 cfm (cubic feet per minute) 6,000 cubic feet per hour
Static Pressure (maximum)	152 cm (water lift)	60 inches (water lift)
Weight (DriForce Blower only)	6.3 kg	14.5 lbs.
Air Nozzle Hole Size	Less than 6 mm	Less than <u> </u> inch
ADS Air Delivery System	13 sections, 2 meters each (28 total) 3.8 cm “magnum” crush-proof	13 sections, 7 feet each (91 feet total) 1.5-inch “magnum” crush-proof
Flexible Tubing	122 meters of 0.375 mm ID	400 feet of 3/8” ID
Power Draw	5 amps at 230 volts, 50 hz	
Carrying-Storage System	2 “suitcase” duffle bags with handle and wheels	
Drying Modes	Either Positive or Negative Pressure	
Parts	100 air nozzles, 8 manifolds (12 outlets each), 4 manifold endcaps, 4 coupler fittings, 2 T fittings, 28 hose cuffs, 25 tube extender connections, 1 muffler	
Estimated Capital Cost	Less than \$18 US per foot of linear drying	
Warranty	90 Days (All Costs Including Carriage) 1 Year (All Parts and Return Carriage)	
Safety Listings	CE	