

**TEAM BLOWTHERM'S PACKAGE TO
WORLD MARKETING RESEARCH CENTER
FOR THEIR
BUSINESS BRIEFING:**

Global Truck & Commercial Vehicle Technology

PART 1

**ONLINE TECHNOLOGY AND
SERVICES CATALOGS**

- ☒ WMRC required information page
- ☒ 600-800 words promoting company / product
- ☒ Four photos for inclusion
 - Image #1 (Airflow)
 - Image #2 (Quality construction)
 - Image #3 (Single skin vs insulated)
 - Image #4 (Multiple configurations)
- ☒ Three key phrases promoting company/product
- ☒ Full contact details including email address
- ☒ Website address for hyperlink

PART 2

**SPONSOR SECTION / CORPORATE
INFORMATION**

- ☒ Website address for hyperlink

PART 3

TECHNOLOGY SECTION

- ☒ 1500-2000 word technical article

PART 4

ADVERTISEMENT 2-PAGE SPREAD

- ☒ UPS Worldwide tracking # 1Z3204596644509491
22 Feb 2000

PART 1

ONLINE TECHNOLOGY AND SERVICES CATALOGS

NAME OF COMPANY: TEAM BLOWTHERM

BUSINESS BRIEFING: Global Truck & Commercial Vehicle Technology

Please tick (☑) the product & service categories that best describe your product.

AUTOMOTIVE PRODUCT AREAS

- | | |
|--|---|
| <input type="checkbox"/> Materials Handling | <input type="checkbox"/> Engine Design & Development |
| <input checked="" type="checkbox"/> Manufacturing | <input type="checkbox"/> Electrical / Electronics |
| <input type="checkbox"/> Advanced Design & Engineering Systems | <input type="checkbox"/> Paints & Coatings |
| <input type="checkbox"/> Automotive Interior Systems | <input type="checkbox"/> IT |
| <input type="checkbox"/> Braking & Handling | <div style="border: 1px solid black; padding: 5px; display: inline-block;">Truck refinishing /
Collision repair / Fleet
maintenance</div> |
| <input type="checkbox"/> Emissions Legislation & Compliance | |

Others

Please supply:

600-800 words promoting company / product (as both .txt file and .pdf “hardcopy” file)

Four photos for inclusion

Three key phrases promoting company/product (maximum 10 words each)

Full contact details including email address

Website address for hyperlink

Material to be supplied in a zip file to the following e-mail address:

online.catalogue@wmrc.com

WHO NEEDS A SPRAY BOOTH?

Is your finishing or refinishing operation clean, energy-efficient and does it meet your production standards and levels? Is there evidence everywhere of paint or coating overspray, and an odor which proclaims that there are paint and coatings propellants in the air? Is production time spent on re-dos due to dust or dirt contamination or uneven curing, rather than meeting your production timelines? Paint technology requires a spray booth to have pre-engineered filtered heated air with precise temperature controls for all relative cycles.

The days of OEM finishes or refinish product applied in a self-fabricated overspray evacuation enclosure, or in no enclosure at all, are swiftly coming to an end all over the world. With concerns about the greenhouse effect, global warming and the prevention of atmospheric and other pollution on the agenda of every government, manufacturers and others who include finishing as part of their process are finding that they must comply with new, more stringent rules.

Another global driver is the never-ending quest for quality in production. Competition centers on who can get what to the market with the least cost and highest profit. Those manufacturers who can reliably reach their quality standard on the first pass are the ones who will dominate their field.

How are these two influences impacting the global arena? It will work this way. Only those manufacturers or refinishers that can bring their processes in line with current regulatory demands in their region will continue to operate. And of those that continue to operate, only those who can achieve a high-grade finish on the first attempt will prosper.

How can Team Blowtherm's products help the manufacturer? Team Blowtherm, world's largest booth manufacturer, offers a complete line of equipment engineered specifically for isolating and enhancing finishing operations, while at the same time complying with the myriad of requirements established relating to safety and health. More than that, Team Blowtherm equipment can help the manufacturer / refinisher achieve a superior finish in one pass, a fundamental requirement of fiscal prosperity.

This equipment is now available to truck manufacturers and refinishers worldwide. Team Blowtherm's Automotive, Industrial and Truck / Heavy Duty Spray Booths provide a safe and efficient working environ-

ment for all coating applications. Today's technology combined with over 100 years of proven experience ensures a high-production facility with years of dependable service.

When the time comes to acquire a spray booth system for the first time, a few decisions have to be made. The cost and ultimately, the final configuration, of a spray booth system is affected by the requirements of the object to be finished, such as size and portability, the materials the booth itself is constructed of, and the type of airflow required to adequately power the process. These three factors together determine the investment required. For example, an non-insulated single skin configuration will cost less than a dual skin insulated model. A larger booth will cost more than a smaller booth. A crossdraft system will cost less than a pressurized or downdraft system. Where the benefits of one choice versus another are negligible, as with single vs. dual skin, why spend money for the unneeded feature? When it comes to airflow, however, choices really do affect the quality of the finish. "Is a premium finish really required?" then becomes a critical question.

Our equipment features:

Flexible modular design

Image #1

- Multiple width, length and height combinations allows for expansion from 24' to unlimited lengths
- Pre-engineered heated air management systems
 - Downdraft
 - Pressurized Crossdraft
 - Crossdraft

Quality construction

- 18-gauge pre-coated and 14-16 gauge structural steel components
- Precise tolerance engineering
- Wall-mounted 6-tube ETL approved Class 1 Division 2 fluorescent light fixtures for superior illumination
- Equipment installation by certified (S.I.S.) Sales, Installation and Service distributors

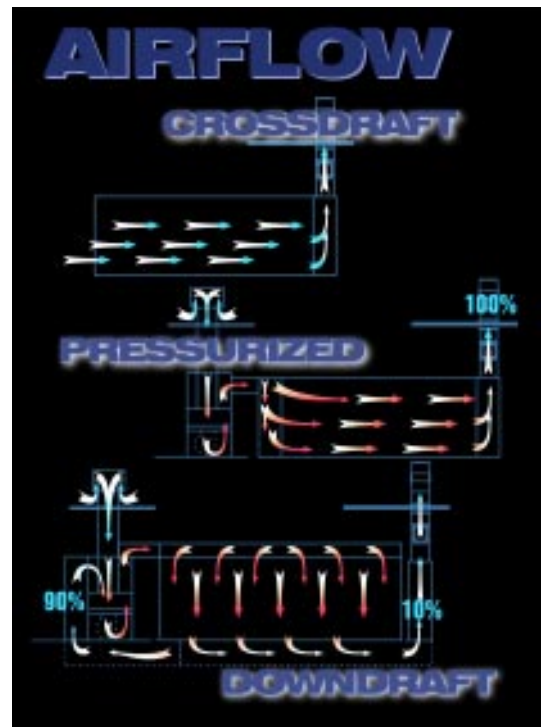


Image #2

More choices to meet your requirements

- Wall designs
 - Single (non-insulated)
 - Double (insulated)
- Booth configurations
 - Drive-Thru
 - Split
 - Solid Back
 - Combinations
 - Curing ovens
- Custom engineering for special applications
- 2-axis and 3-axis man lifts
- Indoor/outdoor spray booth systems
- Indoor/outdoor heated air makeup systems

Image #3



Image #4

Team Blowtherm was formed in 1998 when Blowtherm USA acquired DeVilbiss Spray Booth Products. Blowtherm USA, Inc. was formed in 1993 by a merger between Thermal Downdraft Systems and Blowtherm Spa of Italy. The combined companies' history of designing and servicing spray booth systems exceeds 100 years. Blowtherm USA's corporate headquarters is in Irving, Texas, and has manufacturing facilities in Irving, Texas, Barrie, Ontario, and Toronto, Ontario. Sales, R&D and training are headquartered in Atlanta. With these integrated North American operations, Team Blowtherm is dedicated to advancing technology for the entire refinishing industry.

So, who needs a spray booth? Every truck finisher or refinisher who wants to optimize and preserve the available resources, that's who.

Three key phrases promoting company/product (maximum 10 words each)

Flexible modular design

Quality construction

More choices to meet your requirements

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Website address for hyperlink

<http://www.teamblowtherm.com>

PART 2

SPONSOR SECTION / CORPORATE INFORMATION

Website address for hyperlink

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PART 3 **TECHNOLOGY SECTION**

1500-2000 WORDS TECHNICAL ARTICLE

SPRAY BOOTH BASICS

Before learning the features, benefits and uses for spray booths, it is important to know the basics that apply to all spray booths:

- ✓ The reasons for using a spray booth.
- ✓ What a spray booth can and cannot do.
- ✓ A new spray booth installation can be subject to various government approvals.
- ✓ Regulations that have governed spray booth design and booth classifications.
- ✓ The difference between regulation compliance and environmental compliance.
- ✓ How to determine booth efficiency.
- ✓ The most common types of booths, and how they are used.

The purpose of a spray booth is to:

- ✓ Confine the application of a hazardous material to a restricted controlled environment.
- ✓ Prevent hazardous overspray and volatiles from escaping confinement and causing fire or explosion hazard to nearby operations.
- ✓ Control air fuel/mixture so that a combustible combination cannot occur.
- ✓ Provide a clean environment in which to paint.

REGULATION OF SPRAY BOOTHS

The primary function of a paint spray booth is to reduce the likelihood of fires and explosions. A secondary consideration is protecting the operator from toxic materials. This protection is best done with respirators, protective clothing and hoods. Spray booths cannot be designed to adequately protect the operator from overspray contamination. It is not unusual for part geometry to require the spray gun to be directed near the operator.

A spray booth is designed to collect solid particulate only, not solvent vapors. A spray booth is not an emission control device. Standards place limitations only on the amount of toxic material in the form of solvent vapor, known as volatile organic compounds (VOCs), entering the environment through the booth exhaust stack. To comply with regulations, exhaust air may need to be treated with equipment installed outside the spray booth. Carbon adsorption systems, or incineration systems, for example, are acceptable methods for collecting VOCs.

A new spray booth installation is approved or denied by the "authority having jurisdiction." For example, in areas dealing with public and employee safety, the authority may be an official of a federal or local agency. Or the "authority having jurisdiction" may be a regional official such as a fire chief or marshal, building or electrical inspector, fire prevention bureau inspector, or labor or health department inspector. For insurance purposes the authority may be an insurance inspector or representative of a rating bureau. Greater environmental concern has also led to increasing involvement by new agencies having jurisdiction. There are might be many agencies that dictate compliance.

Some of the American agencies and codes that influence booth design and installation include:

- The Occupational Safety and Health Administration (OSHA), concerned with employee health and safety, especially in the areas of Spray Finishing, Ventilation and Noise Exposure
- National Fire Prevention Association (NFPA) Bulletin 33, guidelines on fire prevention.
- NFPA-70 (National Electrical Code)
- Factory Mutual (FM)
- Industrial Risk Insurers (IRI)
- The Environmental Protection Agency (EPA) for toxic material in exhaust stack emissions, liquid and solid waste streams only.

The burden of regulatory compliance falls on the end user. Ignorance of regulations and procedures is not a defense against noncompliance.

Spray Booth Classifications

Spray booth classifications have developed according to the types of electrical equipment and other possible ignition sources that can safely be used within those areas. In the United States, Class 1 covers flammable gasses and vapors and Class 2 covers combustible dusts. Divisions 1 and 2 cover locations in the classified area in which these flammable gasses, vapors and dusts are handled. Most booths are Class 1.

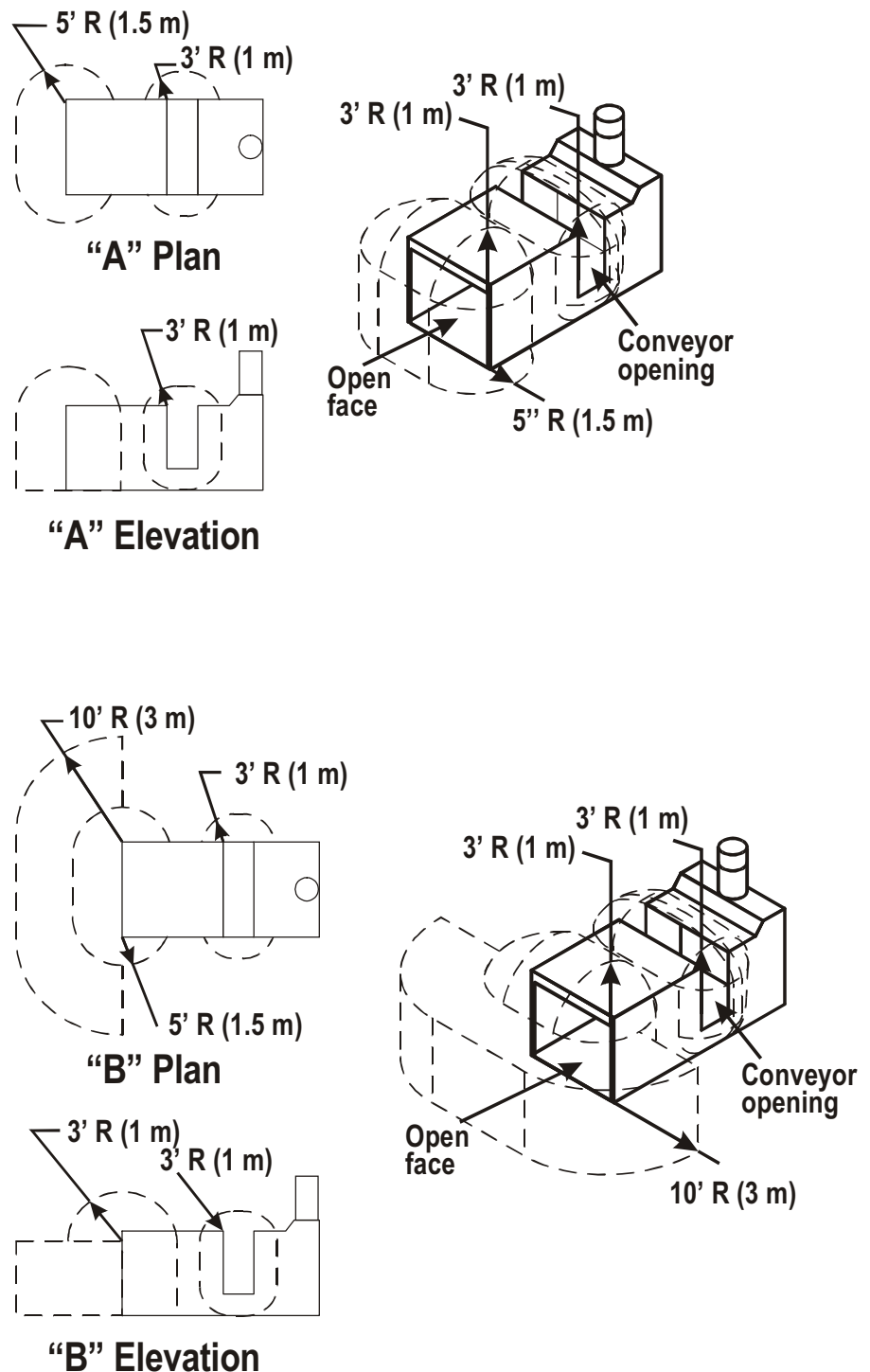


Fig. 1. Clearances required for spraying with (A) and without (B) exhaust fan interlock.

Class 1 Division 1 areas are the inside of the spray booth and the inside of the ductwork. Class 1 Division 2 is any area within a 10 foot radius of the open face of a spray booth when the spray gun is not interlocked with the exhaust fan to prevent spraying unless the fan is operating. When the spray gun and

fan are interlocked, the Class 1 Division 2 area extends five feet back from the open face. This area also extends three feet from a conveyor opening and includes the area above the ceiling of the booth. Equipment located in the Class 1, Division 1 atmosphere must be classified as explosion-proof. In practice there should be no electrical items inside a spray booth. Electrical equipment in the Class 1, Division 2 atmosphere must be UL listed and must not produce sparks under normal operating conditions.

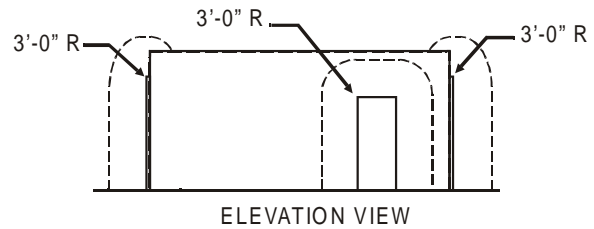
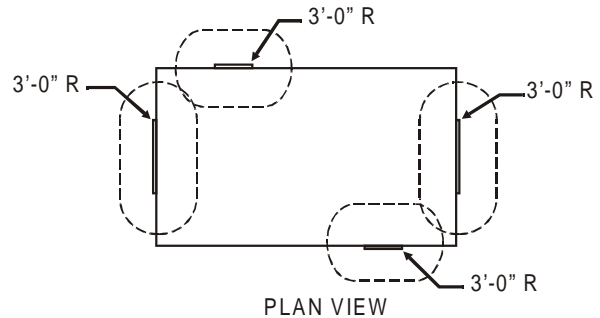


Fig. 2. Clearances required for Class I or Class II, Division 2 locations adjacent to openings in an enclosed spray booth or room.

MEASURING BOOTH EFFICIENCY

By design, a spray booth collects solids known as particulate emissions. Efficiency factors, specifically grain count, measure how effectively a spray booth and filter system will be in trapping these particulate emissions. Because of its ability to trap particulate matter, a spray booth can help the end user meet environmental requirements. While some spray booth designs are more efficient than others at preventing material from entering the environment, high efficiency factor ratings do not automatically ensure environmental compliance.



TYPES OF SPRAY BOOTHS

Automotive, Truck and Trailer Type of Booths

A spray booth consists of a work compartment, where spraying takes place and an exhaust chamber for collecting particulate, exhaust fan and motor and exhaust duct to exterior of building. These paint booths are categorized as dry filter because of their method of collecting overspray, and further distinguished by the direction of air flow in the booth. There are a variety of vehicular spray booths available.

Crossdraft booths

The *crossdraft booth* is the most basic type of booth. Air enters the booth through a set of air intake filters and travels through the booth from front to back. It is then exhausted at the rear of the spray booth through disposable paint arrestor filters into an "exhaust chamber".

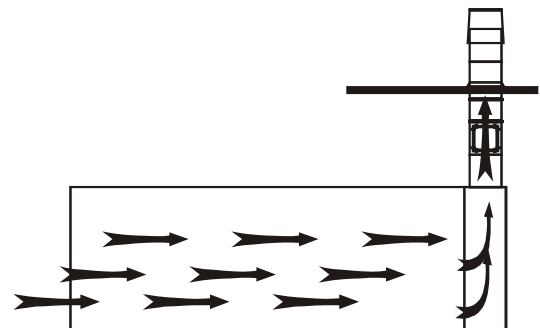


Fig. 3. Cross-draft air flow.

Semi-downdraft booths

The *semi-downdraft booth*, similar to a crossdraft booth in appearance, contains an air intake box (plenum) on the roof. Air, drawn from upper levels of the shop, enters the booth through air intake filters in the plenum. A deflector panel inside the plenum uniformly directs the air forward toward the rear of

the spray booth. The air is then discharged through paint arrestor filters to an exhaust chamber. Because the air enters the top of the booth, and is exhausted at a lower level in the rear of the booth, it follows a slanting or semi-downward movement; thus, the name "semi-downdraft." Fig. 4 shows this airflow movement.

Downdraft booths

This type of booth has become popular with the increased use of enamels. Airflow in *downdraft booths* travels from the ceiling to the floor, where it enters filtered gratings. The downdraft air flow pulls the overspray down into a pit instead of along the length of the part as in conventional spray booths. Very high efficiency ceiling filters must be used to keep dirt from falling onto the product being painted. And unlike crossdraft and semi-downdraft booths that pull the air through the air intake filters, most downdraft booths need some kind of air replacement system to "push" the air through these ceiling filters.

AIR MAKE-UP

An air make-up unit can lower heating and cooling costs. When air make-up is added, the building exhaust system works more efficiently. This information will help you determine when an air make-up system is needed.

Air make-up is the air required to maintain safe and effective building operation by replacing exhausted air. When an exhaust fan is installed in a building, exhausted air must be replaced from outside. This is done either through the cracks and openings in a building or with an air make-up unit. The function of an air make-up, or air replacement, unit is to introduce outside air into the building. This air is usually filtered, cooled, or heated.

Because most buildings are closed in, the flow is restricted, but not completely. Cracks around doors and windows and in the masonry and vent stacks allow air to flow into the building. This air creates drafts and cold spots until it can mix sufficiently with space air to reach room temperature. The normal heating system must work longer and at higher temperature to heat the air seeping from the outside. In addition to the increased heating cost, the negative pressure keeps the exhaust fan from doing its job--exhausting contaminants from the space.

Exhaust fans are rated for a certain air delivery measured in cubic feet per minute (cfm). This rating is based on a specific static pressure. Static pressure is the friction the exhaust fan must overcome to

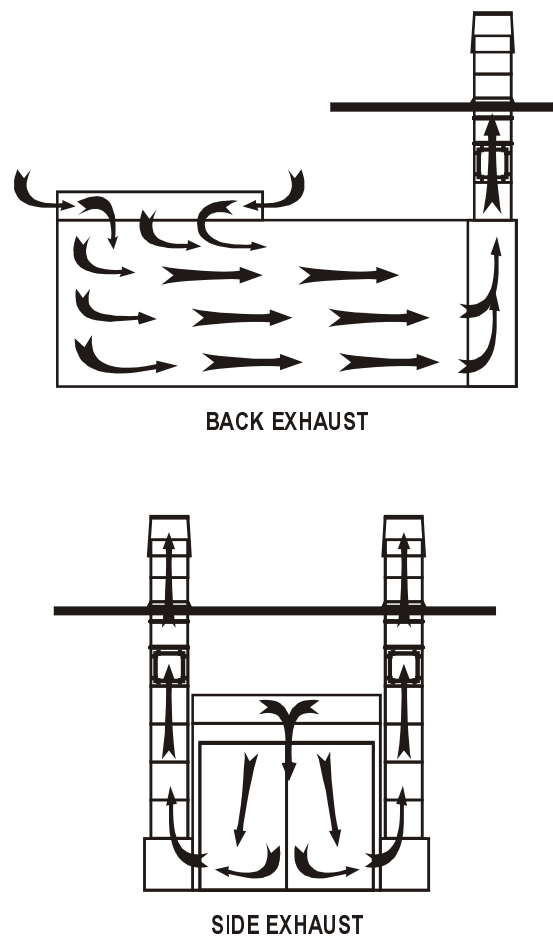


Fig. 4. Semi-downdraft air flow.

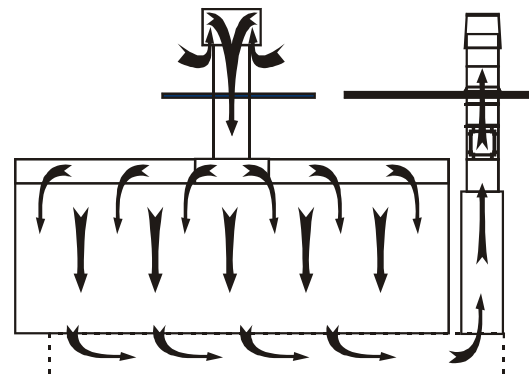


Fig. 5. Down-draft air flow.

exhaust air. The more cracks and openings in the building, and the larger they are, the easier it is for air to move into the building. As the static pressure rises, the exhaust air decreases.

When to install an Air Make-Up Unit

Use the following checklist to determine if a building needs an air make-up unit.

- ✓ Gravity systems, such as vent stacks from a gas-fired furnace or water heater that normally draw air out of the building, are pulling outside air in.
- ✓ Exhaust systems are not operating efficiently, resulting in a build-up of contaminated air within the facility.
- ✓ The inside perimeter of the building is cold because the outside air is being pulled into the building.
- ✓ Exterior doors are hard to open or close because of the pressure exerted by outside air entering the building through them.
- ✓ It is difficult to maintain an even temperature throughout the interior space.

Some areas require that the work compartment of a spray booth be maintained at a minimum temperature of 65° F (18°C). To meet this regulation, it is mandatory that heated air make-up be used during the winter months.

Installing an air make-up unit sized to the building will improve exhaust system efficiency and provide greater control over the interior temperature. With the correct balance of air, it is easier to control air pressures to alleviate problems in opening or closing doors. Balance also prevents contaminants or odors from travelling to different areas of the building. The air make-up unit reduces fuel bills by eliminating drafts.

Types of Heaters

Two types of heaters are most commonly in use. Direct-fired gas heaters are the most economical choice. Indirect-fired gas heaters are only used when there are restrictions against the use of direct-fired units. Other types of heaters include steam or hot water heaters, which are the least efficient, and used only when there is an existing boiler that has additional capacity to handle the air make-up system; and electric units, which should only be used when alternative fuels are not available because its extreme cost.

The formula for calculating costs is as follows:

$$\text{Annual fuel cost} = \frac{\text{cfm} \times (T - T_o) \times 1.08 \times H \times C}{F \times E}$$

cfm - Actual cubic feet of air delivered by the air make-up per minute

T - Temperature of air leaving unit (should be same as space temperature)

T_o - Average outside air temperature during heating season

1.08 - Constant arrived at by multiplying 0.075 (air density) by 0.24 (specific heat) by 60 min/hr

H - Total hours of operation from October through April inclusive

F - BTU value of one unit of fuel (generally, 1,021 for natural gas per cubic foot)

E - Efficiency of unit (0.92 for direct-fired air make-up unit)

C - cost of one unit of fuel (must be expressed in the same units as those used for F)

The following example illustrates how the fuel cost formula works. A 10,000-cfm air make-up unit in a building in St. Louis operates 60 hrs per week at 65°F (18°C) space temperature. It is fueled by natural gas at \$0.40/ft³. We find the annual operating hours by

$$\frac{7 \text{ months of operation} \times 52 \text{ weeks} \times 60 \text{ hrs/wk}}{12 \text{ months/year}} = 1820 \text{ hours}$$

Translate heating value into BTU/100 ft³

$$1021 \text{ BTU/ft}^3 \times 100 \text{ ft}^3 = 102,100 \text{ BTU/100 ft}^3$$

Figure annual costs

$$\frac{10,000 \times (65 - 43.1) \times 1.08 \times 1,820 \times 0.40}{102,100 \times 0.92} = \$1833.10$$

This sum represents the greatest cost to operate the air make-up unit. Actual cost could be less.

quality construction - flexible modular design - more choices



Team Blowtherm Truck and Heavy Duty Spray Booths continue to set the standard for the industry.

With thousands of booths in daily use, Team Blowtherm is the most experienced large-scale spray booth builder in North America.

Modular in design and construction, Team Blowtherm systems allow finishers a wide variety of choices.

Truck/Heavy Duty Spray Booths

Team Blowtherm Truck / Heavy Duty Spray Booths provide a safe and efficient working environment for your painting operation. The latest technology combined with over seventy years of proven experience ensures you of a high-production facility that will reward you with years of dependable service.

Flexible modular design

- Multiple width, length and height combinations allows for expansion from 24' to unlimited lengths
- Three types of air flow systems: Downdraft, Pressurized Crossdraft, and Crossdraft

Quality construction

- 18-gauge pre-coated and 14-16 gauge structural steel components
- Precise tolerance engineering
- Wall-mounted 6-tube ETL approved Class 1 Division 2 fluorescent light fixtures for superior illumination
- Equipment installation by certified (S.I.S.) Sales, Installation and Service distributors

More choices to meet your requirements

- Booth configurations: Drive-Thru, Split and Solid Back, and Combinations
- Custom engineering for special applications
- Indoor or outdoor types



Overspray Management Technology

- ◆ Paint Pockets® design holds up to five times more overspray than others, cutting filter changes by up to 80%
- ◆ 99.84% average arrestance at 10 microns
- ◆ The paint "pockets" imbedded in its front surface more than double its effective surface area

Paint Pockets® is a registered trademark of Products Unlimited, Inc.



Booth package options include:

- A wide variety of required air make-up systems: Pro-Air™, Forced Dry™, Recirculating Cure
- Paint mixing rooms
- Vestibules
- 2-axis and 3-axis painters' lifts
- Sound attenuation
- EnviroCure™ VOC abatement systems
- Control systems: SBC computerized, and electro-mechanical
- Indoor and outdoor air make-up systems

Let us help you with a single skin pressurized crossdraft or other spray booth. Write us:

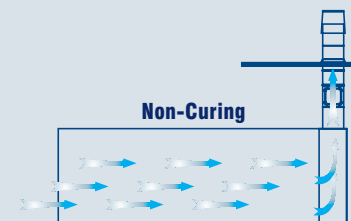
trucksales@teamblowtherm.com



WORLD STANDARD FOR QUALITY AND RELIABILITY

Non-Pressurized Crossdraft Design

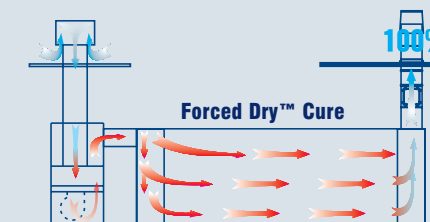
Concept XL (single skin)



- Most economical model
- Crossdraft airflow
- Non-pressurized
- High illumination
- Pre-coated booth finish
- 30% more light

Pressurized Crossdraft Design

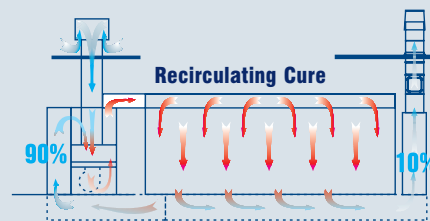
Concept XL (single skin)



- Pressurized horizontal flow
- Lower price
- Multi-filtered airflow
- Pre-coated booth finish
- 30% more light
- Heated Forced Dry™ or non-heated ProAir™ air replacement systems

Downdraft Design

Ultra XL (insulated) and Concept XL (single skin)



- Downdraft airflow
- Precise temperature most fuel efficient
- Air flow management
- Contamination control
- Multi-filtered air
- High-production environment
- Select Recirculating cure or Forced Dry cure
- Pre-coated booth finish
- 30% more light
- High quality finishes

Team Blowtherm's new state-of-the art 25,000-sq. ft. Technical Training Center, the ultimate environment for testing today's equipment and finishes, is a unique facility, which is widely recognized for its spray booth research and development, and the establishment of finishing and refinishing standards. The new Tech Center features our Concept XL™ pressurized crossdraft and Ultra XL™ downdraft spray booths. We have available end-user seminars to improve operator effectiveness and provide maximum use of the equipment. This facility is the foremost in research and development, and paint manufacturers' product testing. All of the equipment is "paint-ready" for demonstrations and testing.



Spray booth systems by

Team Blowtherm®

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