

Automotive Body Shops

Fact Sheet

The following information provides information pertaining to Auto Body Shops and some of the associated hazards and safeguards. It also provides an overview of some of the standards pertaining to this subject.

Typical Body Shop Processes:

An auto body shop is a business where customers can take their vehicles for repairs. This can include very small repairs such as a dent or window replacement up to and including a full body makeover with welding and painting.

Tasks performed in a body shop include receiving, cleaning, repairing, refinishing, and painting of damaged automotive vehicles; examining damaged vehicles and estimating cost of repair; pulling out dents; filling depressions with body fillers; refinishing and repainting auto body parts; removing and replacing hood, fender, core support, door shell, etc.; removing upholstery, accessories, electrical and hydraulic equipment to gain access to auto body and fender; replacing windshields and repairing windshield cracks; completing minor estimates of damaged area; straightening out and/or realigning vehicle frames.

A worker in a body shop often dismantles vehicles; removes and replaces air bag systems and sensors; applies decals; recharges air conditioning systems; arranges disposal of waste paints, solvents, and other chemicals with a licensed disposal company.

Although all of the above processes are common to body shop operations, this paper will focus on the fire hazards associated with body shops operations.

Hazards Associated With Automotive Body Shops:

In an auto body shop there are many hazards to be aware of including but not limited to flammable and combustible liquid storage and handling, various types of welding, spray finishing, drying and general housekeeping.

Flammable/Combustible Liquids can best be controlled by limiting amounts on site. Any liquids outside the standard storage area should be limited to one day's supply. All other liquids should be kept in standard storage areas and never exceed maximum allowable limits.

Housekeeping can be best controlled by having a regular clean up program in place. This will reduce the amount of combustibles including dust throughout the premises.

Hot Works/welding is best controlled by ensuring all equipment is in good working condition and clear of combustibles and flammable materials. Hot works/welding should be only performed by trained and qualified personnel. All equipment should be kept in good working order and checked for leaks prior to every use. All valves should be closed and electric hot works de-energized when not in use. Hot works should be carried out in an area free from flammable and combustible contents, with walls, ceiling and floors of non combustible construction or lined with non combustible materials. When this is not possible, all flammable and combustible contents shall be kept a minimum of 15 meters away, protected by non combustible materials or have the area thoroughly wetted prior to work being done. A final inspection of the area should be made 4 hours after the welding has stopped.

Spray Finishing also creates a hazard due to Overspray and Flammable Vapours. Collecting Overspray and Flammable Vapours can best be done by installing a standard spray booth with adequate make up air, ventilation filters.

Safeguards Necessary to Control the Hazards:

Auto Body Shops are subject to various codes and standards including:

- NFPA #30 – Flammable and Combustible Liquids Code
- NFPA #33 – Spray Finishing Operations
- Local or regional Fire Codes

Flammable and Combustible Liquids:

Flammable and Combustible Liquids are broken down into 5 categories as follows:

Flammable Liquids	Class IA	- flash point < 22.8°C (73°F) / boiling point < 37.8°C (100°F)
	Class IB	- flash point < 22.8°C (73°F) / boiling point ≥ 37.8°C (100°F)
	Class IC	- flash point ≥ 22.8°C (73°F) and < 37.8°C (100°F)
Combustible Liquids	Class II	- flash point ≥ 37.8°C (100°F) and < 60°C (140°F)
	Class IIIA	- flash point ≥ 60°C (140°F) and < 93.3°C (200°F)

Of particular concern are the solvents used for thinning paint for spraying operations and cleaning as these tend to be Class I liquids. Flammable and Combustible Liquids not in use must be stored in specially engineered buildings, rooms or cabinets which have been designed and built to standards set out in the above mentioned codes, standards and local bylaws for that particular class of liquid and use. Specific requirements will include construction, containment, ventilation requirements and control of electrical hazards and other sources of ignition. Codes, standards and local bylaws may vary from jurisdiction to jurisdiction, but one constant is that flammable and combustible liquids in the open should be limited to one day's supply.

Housekeeping: Good housekeeping is a very important feature of a well-run auto body shop. Daily clean up (if not more often) should be performed to keep the amount of combustibles and dust to a minimum. Suppliers often ship parts wrapped in cardboard. Add to this all the sanding, paper and tape used to prep a car for painting and you have added extra fuel load to the building. From a liability standpoint, there are also many trip and fall hazards in a body shop. These include but are not limited to extension cords and hoses for air tools (keep in mind-extension cords are for temporary use only). Also in some body shops there are "eyelets" cemented into the concrete to hold a car chained in place to straighten frames etc. These are usually hidden and should be well identified to prevent tripping.

Spray Painting: The easiest way to control the hazards of spray painting is to keep them small. The best way to do this is to use a spray booth specially designed for the operation. Spray booths must be steel frame construction with steel walls with a minimum thickness of 1.14 mm or be of an equivalent non combustible construction. The interior finish of the booth is required to be a smooth and continuous non combustible surface. Other construction considerations include the floor, which must be non combustible, the size of the booth and the allowance for lighting which is normally through special glass panels from the exterior of the booth. Except where separated from the spray area by a vapour tight separation with no openings, all electrical equipment within the spray area, including lighting fixtures, shall be of an explosion/vapour proof type (intended for use in a Class I, Group D, Division 1 or 2 hazardous location), designed for that use and installed according to the manufacturer's recommendations, local codes, standards and bylaws.

Spray painting creates two types of hazards.... the build-up of overspray and the accumulation of flammable vapours. To control these hazards, spray booths are also required to be equipped with an overspray collection system to prevent overspray from accumulating on the exhaust fan and in the ductwork. Control of the vapours is provided by the use of exhaust fan motors which are normally located outside the ductwork and booth as they are not permitted to be subject to the build-up of overspray residue. Fan blades which are located in the ducts must be of a non ferrous material to prevent sparking.

Interlocks must be provided between spraying equipment and ventilation systems to prevent operation of the spraying equipment when the ventilation system is shut down or the circulating pump of a water wash system is not operating.

There are several types of overspray/ventilation systems in use. Most use either a dry filter style or a water wash style, including downdraft booths. The following diagram indicates the different methods of providing ventilation and designates them as:

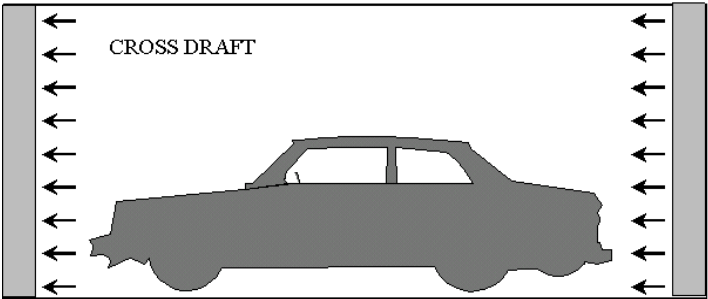
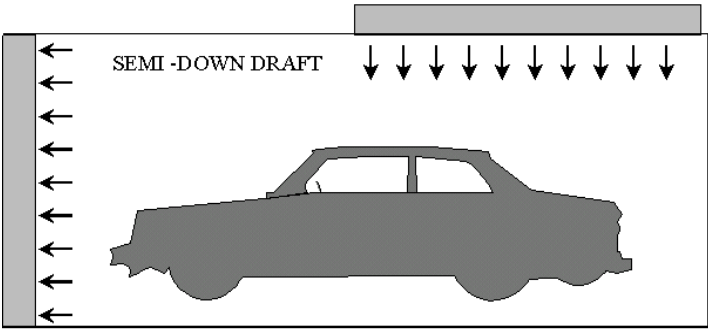
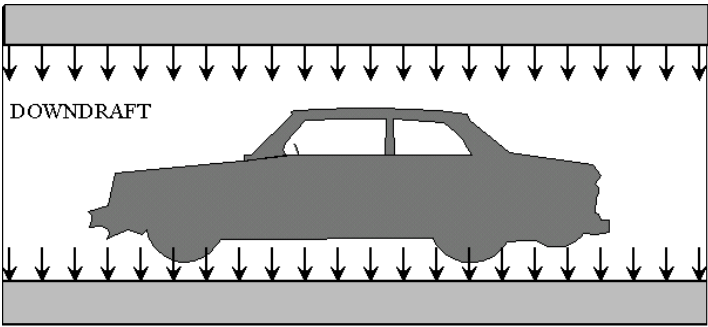
- Downdraft
- Semi Downdraft, or
- Cross Draft

The difference is determined by the method that the air is drawn into and exhausts from the booth.

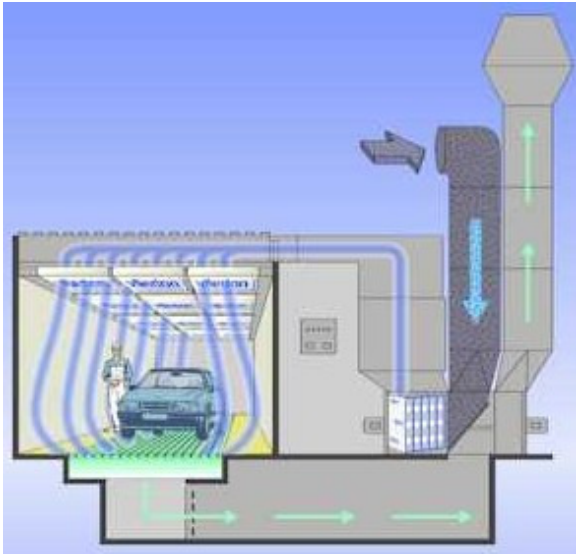
Drying Operations are permitted inside the spray booths providing the interior surfaces of the spray booth are kept clean of overspray. Portable dryers are also permitted providing they are electric infrared and are removed during spray painting operations. Interlocks must be provided to prevent spraying and drying operations from taking place at the same time. These interlocks also provide a minimum three minute purging time after spraying to remove vapours, maintain a safe atmosphere within the enclosure during drying and ensure drying equipment will shut off when the ventilation system is shut down.

The type of booth used is somewhat dependent on the size of the job. A typical example for various activities is shown in the following table.

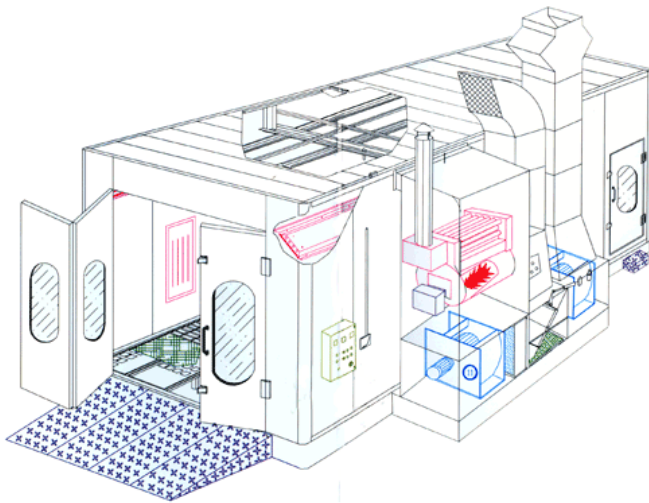
Painting Activity	Type of Booth Used for Activity
Painting entire vehicle within booth	Downdraft with an average air flow around car of 80 fpm and no point with an air flow less than 60 fpm.
Painting parts of a vehicle within booth	Semi downdraft; crossdraft
Painting car parts that are not attached to car	Downdraft, paint overspray directed at front or back of booth.



The three different styles of spray painting booths in the auto body repair industry.



Schematics and Photos of a Downdraft Booths





Typical Dry Filter, Cross Draft Type Booths



Portable Infrared Drying Lamp



Cabinet Spray Booth for Small Jobs