

## WELDING FUME EXHAUST SYSTEMS

The following is a helpful guide in helping design an efficient and reliable welding fume exhaust system. Our design criteria follows that of The American Conference of Governmental Industrial Hygienists and some of the following are excerpts from the ACGIH Manual of Recommended Practice 22nd Edition as well as clips from various Welding Journal magazine articles.

Engwald is proud to be a member of the newly formed **N.A.O.V.E.R.M.** National Association of Vehicle Exhaust Removal Manufacturers, which has as one of its goals, the development of standards and specifications for the industry and to present them to other national organizations such as **BOCA** and **ASHRAE**.

Studies have compared the lungs of heavy duty welders without proper ventilation, to lungs of people who smoke. The findings were that these welders had the lungs of people who smoke about 25 Cigarettes a day.

A common problem with general ventilation systems in regards to welding fumes is that welding smoke particles stay in the air a lot longer than grinding particles (therefore, a larger spread throughout the workplace). For example, it takes 4 hrs. for a welding smoke particle to hit the floor from a height of 3 ft. whereas, it takes only 3 min. for a grinding particle from the same height.

All of Engwalds' fume exhaust systems are based on the principal of Source Capture, in other words, capturing the contaminant as close to its source as possible, thereby not allowing it to get into the general atmosphere where the worker can breath it in. The main objective is to keep the welder's breathing area as clean as possible. Welding smoke consists of fine particles and gases, which spread at a relatively low speeds from the point of welding and are fairly easy to capture, so why not capture them at the source.

### DESIGN GUIDELINES:

The **ACGIH** Manual defines Capture Velocity as the minimum hood-induced air velocity necessary to capture and convey a contaminant. It offers the following table:

Condition of Dispersion of Contaminant	Example	Capture Velocity, fpm
Released with practically no velocity into quiet air.	Evaporation tanks, degreasing	50-100
Released at low velocity into moderately still air.	Spray booths, container filling, welding, plating, pickling	100-200
Active generation into zone of rapid air motion.	Spray painting in shallow booth, barrel filling, conveyor loading	200-500
Released at high initial velocity into zone of very rapid air motion.	Grinding, abrasive blasting tumbling.	500-2000

