

## Case Study – Compressed Breathing Air Systems

A large manufacturer uses isocyanate-based paint on its product. Isocyanate-based paint can cause respiratory sensitization at very low airborne concentrations. The paint is sprayed on the parts in a large booth by two workers. Workers are provided with loose-fitting hoods which are provided a continuous flow of air from the compressed breathing air system. The compressed breathing air system was an ambient low pressure system.

The system was tested for both the quality of the air and the volumetric air flow provided to the hood. While the quality of the air was acceptable, the amount of air provided to the hood was well below the flowrate specified in the CSA Standard. When asked, the worker reported that he could often smell the paint inside of the hood. This is a clear sign that the worker was being exposed to isocyanates inside his hood.

The unit was a  $\frac{3}{4}$  horsepower unit. This unit is rated to provide sufficient airflow to 2 workers if they are wearing tight fitting facepieces or one worker using a loose-fitting hood. The reason for this is that a tight-fitting respirator requires 114 lpm (litres per minute) while a loose-fitting respirator requires 170 lpm. The workplace had believed that the unit was rated for 2 workers – which it is if the workers are wearing tight-fitting respirators. The workplace replaced the loose-fitting hoods with tight-fitting facepieces which was more economical than upgrading to a higher horsepower air pump.

### Number of Workers Who can Use an Ambient Air Pump

| HP Rating  | # of loose hoods | # of Tight Facepieces |
|------------|------------------|-----------------------|
| <b>3/4</b> | 1                | 2                     |
| <b>1.5</b> | 2                | 3                     |
| <b>2</b>   | 2                | 4                     |

\* Example:  $\frac{3}{4}$  HP compressor can provide air to 1 loose hood OR 2 tight facepieces

### Required Flowrates as Specified by CSA Standard

| Type of Facepiece       | Required Airflow |
|-------------------------|------------------|
| Loose fitting hood      | 170 lpm          |
| Tight Fitting Facepiece | 114 lpm          |

Lpm = litres per minute