



Guidelines for the measurement of EDC and VCM levels around manufacturing sites (“immissions”)

BACKGROUND AND INTRODUCTION

Monitoring EDC and VCM levels inside plants has been common practice in the European PVC industry at least since the Vinyl Chloride Monomer Directive 78/610/EEC of 29 June 1978 entered into force. On the other hand, measuring EDC and VCM levels outside manufacturing sites (often referred to as “immissions”) is not mandated at EU level and is only obligatory for a limited number of sites, usually as a result of initiatives by local authorities. Such monitoring is done only by a limited number of companies, applying a wide range of sampling strategies and measurement methods.

However, monitoring human exposure outside the plants’ fences is becoming increasingly important, due among other factors to a growing trend moving away from thresholds to consideration of the ‘excess risk’ resulting from exposure to carcinogens. The REACH requirement for Chemical Safety Assessments goes in the same direction.

In May 2007, the Vinyls Committee mandated the Production Committees for developing a common methodology to monitor immissions around sites. Measuring and equipment standards exist already, but not guidelines on frequency and location of sampling, interpretation of the results, etc. A dedicated Task Force was created in June 2007 in order to develop a common understanding of some key methodology issues. The present document summarises the consensus reached by this Task Force.

OBJECTIVES OF THE GUIDELINES

The present guidelines are enumerating a set of criteria which are not specified in the relevant international standards, but are nevertheless considered essential to ensure reliable, meaningful and credible results for EDC and VCM levels around the manufacturing sites.

It is acknowledged that some specific methodology criteria are mandated by national or local regulations, or determined by site service organisations, and hence that the use by all ECVm member companies of a unified method is probably not feasible. Nevertheless, the criteria in the present guideline are also aiming at ensuring sufficient coherence in order to render the results sufficiently comparable. For the avoidance of doubt, agreement with the present guidelines is equivalent to a commitment for applying the guidelines if and when the Vinyls Committee decides that such measurements should take place.

One should bear in mind that the reasons for carrying out such measurements are:

- Demonstrating that the plants are equipped and run adequately in order to minimise human exposure in and in the vicinity of the plant,



- In case of incidents, estimating levels in the neighbourhood in order to assess exposure

METHODOLOGY FOR SAMPLING AND MEASUREMENT

- The guideline applies to measurements made outside manufacturing sites, i.e. in all the areas where access of the general public is not restricted
- Continuous measurements are not required, but are accepted.
- Using an air sampler with pump to accumulate the substance on an appropriate adsorbant, followed by thermal desorption in a laboratory and GC analysis is the most common method. **When using such methods, the relevant ISO 16017 standard must be complied with.**
- In accordance of ISO 16017, the sampled volume must remain below 70% of the breakthrough volume of the adsorbant.
- Sampling time should be at least one hour. A longer duration (8hours) enhances the credibility of the results.
- Sampling must be carried out when the weather conditions, especially wind direction and speed, are stable. Other weather conditions (e.g.) rain should be recorded
- The detection level of the combined sampling and analytical techniques should be $1 \mu\text{g}/\text{m}^3$; which is the WHO guideline value, or preferably lower to ensure better accuracy at low levels.
- The minimum frequency of measurement at any given location should be at least once a month to start with. It can be increased or reduced every year, on the basis of the results of the past year. The frequency may be divided by two if 90 % of the results of the previous year at this location were below $1 \mu\text{g}/\text{m}^3$. The frequency should be doubled if more than 50 % of the results were above $1 \mu\text{g}/\text{m}^3$. The minimum frequency resulting from these adjustments should in any case be at least 3 times a year.
- The minimum number of sampling locations is 3. A reference point can be added (e.g. upstream of prevailing wind), for instance if other potential sources of the substance exist in the vicinity. This additional point does not count in the three.
- The first point of the three should provide a maximum level outside the site's boundaries, and hence be located down stream of the wind, at the fence or (in case of high stacks) at a position where the maximum concentration is likely to occur.
- The other points may be located in any direction, but should be located close to the most critical areas in terms of human exposure (e.g. concentration of people living or working in the area: dense housing, businesses, schools). A model generating iso-concentration curves can be a useful guide by helping to identify those most at risk.

RECORD KEEPING AND REPORTING

Detailed records of the measurements as well as related information should be kept for at least 50 years. The minimum information should include:

- Location of the measurement, i.e. distance from the plant and orientation
- Date, starting and ending time of sampling
- Weather conditions during sampling (wind speed and direction, presence of rain or fog, temperature)



- Date and location of the analysis (e.g. external service provider, plant laboratory, etc.)
- Any factor which might have influenced emissions during the sampling period, e.g. incident or unusual conditions in the plant or storage