

C. Mazziotti¹, L. Millucci², A. Fardelli³ and M. Mari³

¹ CNR-DIITET, ² University of Siena, ³ CNR-IIA

In Europe the industrial emissions are regulated by **IPPC-IED**, that establishes that each installation must have a permit for operating of the installations to ensure a management of plants environmentally consistent.

The implementation of the IED is coordinated with the SEVESO III. The IPPC prescriptions on periodic checks and inspections are also useful for the purpose of monitoring for SEVESO.

The integrated approach requires operators to improve the performance of their plants and explore the potential for innovation by applying the BAT described in the BATC.

REACH complements the Reg. **CLP** on classification, labelling and packaging of substances and mixtures, highlighting the hazardous character of some chemicals currently in use.

Cooperatively with IPPC-IED, many installations adopt a **VOLUNTARY ENVIRONMENTAL MANAGEMENT SYSTEM**, i.e. **ISO 14001:2015** to ensure a continuous improvement of their environmental performance beyond legal minimum requirements.

Prescriptions in IPPC permits

Monitoring fugitive emissions by means of Leak Detection And Repair (**LDAR**) on all accessible components

Using a concentration **threshold** of 10.000 ppmv to classify components as leakers

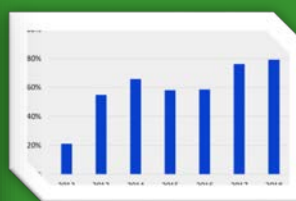
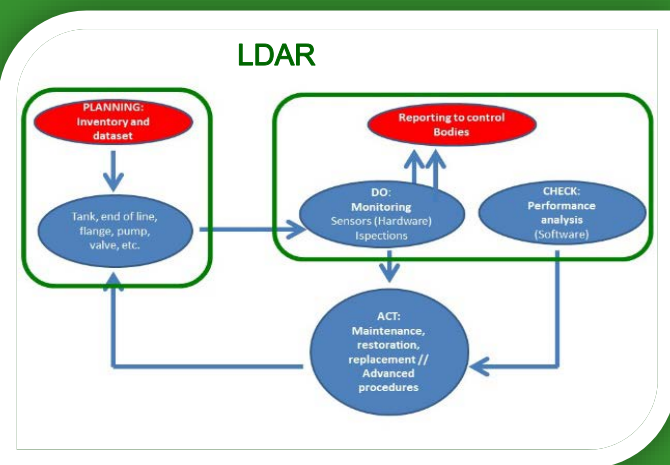
Report the list of all the process equipment for handling volatile fluids, e.g. acetone, benzene, ethylbenzene and cumene to the Competent Authority and the Inspecting Body

Action plan addressing on storage areas with gradual reduction of emissions.

Continuous monitoring, recording and reporting to the Competent Authority and the Inspecting Body

Source: IMELS, 2018.

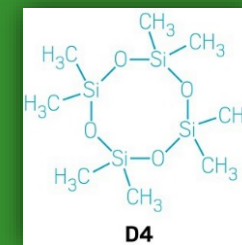
THE CHEMICAL SECTOR IN IT



Increasing trend in the removal efficiencies of annual VOC emissions in a national installation - A (Source: IMELS, 2019).

PRODUCTIVE BIO-ROUTES

In the literature, there is a strong interest in siloxanes used in household cleaning products, personal care cosmetics, such as shower gel, shampoo and deodorants, and additives. Specifically, reference is made in particular to D4, D5, D6



The studies carried out have shown that D4 is a persistent, bioaccumulative and toxic substance (PBT), D5 is very persistent and very bioaccumulative (vPvB).

D4, D5 and D6 can be effectively replaced with lipid materials of vegetable origin, for example, chemical substances extracted from algae, as they are suitable for the formulation of cosmetics.