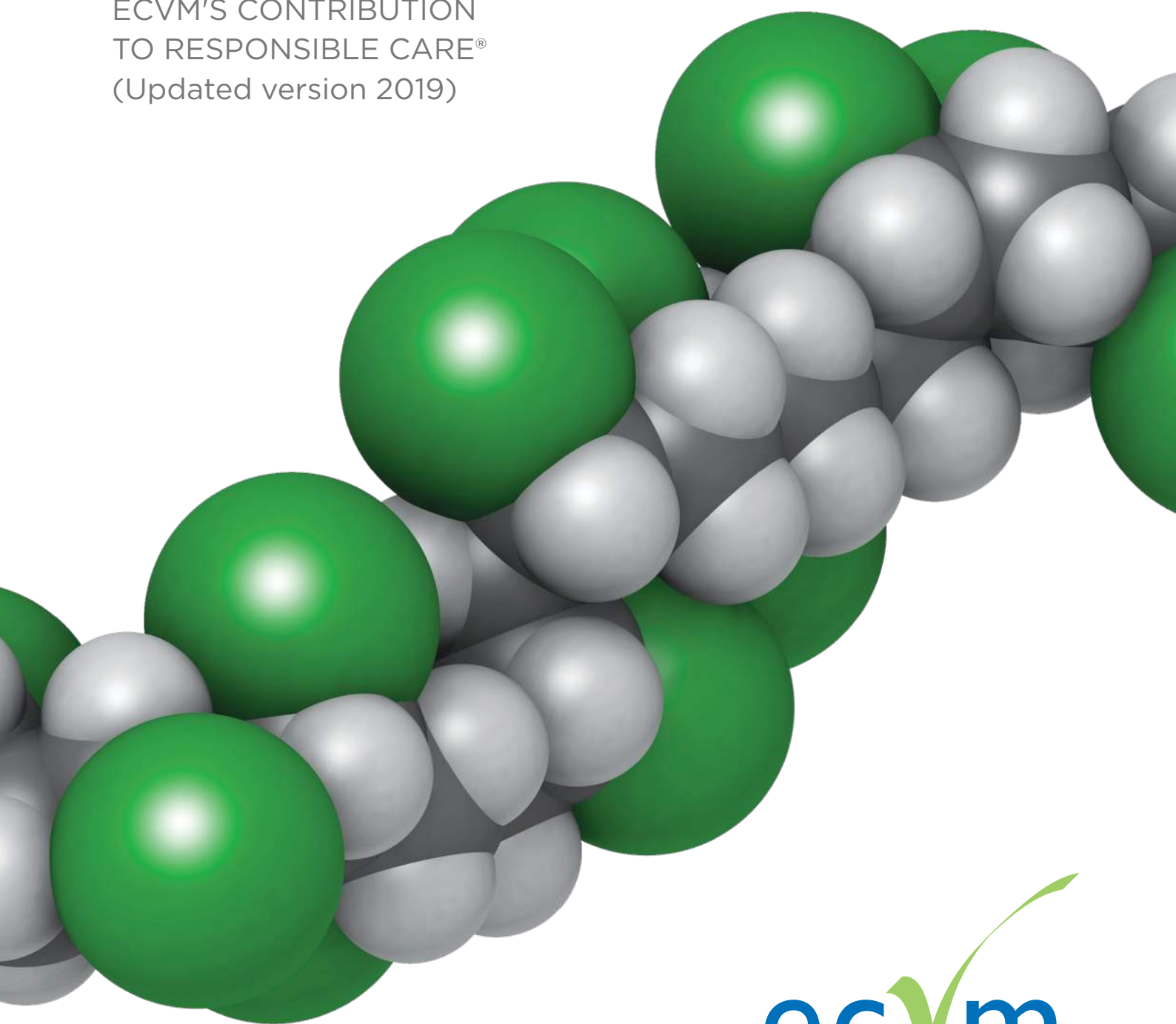


ECVM INDUSTRY CHARTER FOR THE PRODUCTION OF VINYL CHLORIDE MONOMER AND PVC

ECVM'S CONTRIBUTION
TO RESPONSIBLE CARE®
(Updated version 2019)



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INTRODUCTION

Polyvinyl chloride (PVC) is one of the world's most important plastics and has continuously evolved to become today a universally-used, cost effective, adaptable, safe and sustainable material. It is a highly efficient converter of raw materials, combining chlorine produced from rock salt and carbon from naphtha or natural gas to produce a plastic that is specified for a broad range of long and short life applications.

VCM (Vinyl Chloride Monomer) and PVC production plants have continuously improved their performance over the last 30 years, and their environmental impact has been steadily reduced. The European PVC industry recognises, however, that further improvements must be pursued and their scope continually reviewed and widened.



NOTE: This updated document replaces the ECVN Industry Charters for the Production of VCM and PVC (suspension process) from 1995 and for the Production of Emulsion PVC from November 1998, which are no longer in force or valid after 2021.

OBJECTIVES

- The objectives of the Members of ECVN are:
 - > To minimise any detrimental effects from their activities and products to the environment or human health, as far as is in their command.
 - > To comply, as a minimum requirement, with environmental regulations and quality standards laid down by European and national regulatory authorities.
 - > To achieve a “closed loop concept” of production waste, as far as is feasible with practicable technology.

DIRECTIVES

- Operations covered by this Charter include all processing, handling, storage and transport of primary feedstocks and final PVC resin (excluding the compounding and conversion of PVC resin to the finished article).
- All recoverable quantities of VCM and EDC in waste streams from the production process are recovered and recycled into the process, as far as it is technically and economically possible with reasonable efforts.
- Residual levels of VCM and EDC in waste streams are treated by appropriate technology before these waste streams are discharged into the environment.
- Control technology is implemented in VCM/EDC production to eliminate discharge of heavy metals and dioxin-like components to the extent that:
 - > Effluent discharge does not result in exceeding established water quality standards.
 - > Contaminant levels in vent-gases do not exceed the European standard for atmospheric emissions.
- All significant outlets for vent-gas and effluents from the production process are kept under surveillance and valued, in order to determine the effectiveness of the control technology and to measure the final discharge of potential contaminants into the environment.
- Fugitive emissions are monitored and reduced by installing leak-safe technology and by frequent inspections to check the integrity of all relevant sealings. This is generally supported by fixed monitoring systems for measuring VCM and EDC air concentrations in the plants.
- Liquid chlorinated organic by-products from the production process, if not used as feedstock for other chlorination processes, are incinerated with recovery of chlorine in the form of HCl.
- Residual levels of VCM in the final PVC resin will not exceed the amounts agreed.

THE MEMBERS OF THE EUROPEAN COUNCIL OF VINYL MANUFACTURERS (ECVM),

Agree

- That all production, manufacturing and disposal processes of modern industrialised society have an impact on the environment. PVC is no exception.
- That the European PVC industry's stakeholders have the right to expect that this impact is duly measured and, if necessary, reduced in order to meet environmental quality objectives within the scope of Best Available Techniques (BAT) experience and resources.
- That, as a material whose production, use and disposal continually evolves, stakeholders have the right to expect the industry to be vigilant and forward-looking in ensuring that appropriate objectives are set and met.
- That all ECVM Members will share their environmental control 'know how' by bilateral agreement.

Commit

- To agree priorities for environmental control and improvement:
 - > Reduce emissions and other environmental pollutants by introduction of voluntary, controlled systems of target-setting as defined in the Annex, measurement, and operational improvements, setting short, medium and long-term targets that consistently maintain improvements in environmental performance.
 - > Invest in research to pursue future improvements in line with the agreed priorities.
 - > Work in associated industry groups, where appropriate, to improve understanding of shared environmental concern, and to improve processes and technologies to minimise environmental impacts, such as improved recycling and incineration techniques.
 - > Annually review priority standard targets and future areas for action.
- To ensure that the environmental control performance, if not made by the national authorities, will be open to review by an independent third party (e.g. an accredited environmental verifier according to the rules of the European Union Eco Audit Scheme) subject to specification and agreement between ECVM and member companies.
- To limit workers' exposure to VCM as much as technically feasible, as defined in the Annex.
- To participate to the 'Operation Clean Sweep' (or a similar programme by the European plastics or PVC industry) and to apply the auditing method adapted to PVC plants.
- To agree that, whereas member companies already comply with the criteria of the preceding Charters, they will use their best efforts to comply with the revised Charter by 2021.

Act

- To ensure that any ECVM Member which consistently fails to meet agreed industry targets of environmental improvement over clearly-defined periods of time, is called to account.
- To work with other industry bodies, Non-Governmental Organisations (NGOs), stakeholder groups and other interested organisations to agree common working agendas to improve environmental performance as research, science and technology increases understanding of the relationship between the PVC industry's activities and the needs and concerns of its stakeholder communities.

OUR MEMBERS ARE



ERCROS S.A.



INOVYN Europe Ltd.



SHIN-ETSU



VESTOLIT GmbH



VINNOLIT GmbH & Co. KG



VYNOVA Group

The European Council of Vinyl Manufacturers (ECVM) represents six leading European PVC resin producing companies who produce around 70% of the PVC resin manufactured in Europe.

We, the undersigned, herewith agree with the terms and conditions of the ECVM industry Charter

8th May 2019

A handwritten signature in black ink, likely belonging to a representative of Ercros.

ERCROS S.A.

A handwritten signature in black ink, likely belonging to a representative of inovyn.

INOVYN Europe Ltd.

A handwritten signature in black ink, likely belonging to a representative of ShinEtsu.

SHIN-ETSU

A handwritten signature in black ink, likely belonging to a representative of vestolit.

VESTOLIT GmbH

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VINNOLIT GmbH & Co. KG

A handwritten signature in black ink, likely belonging to a representative of VYNova.

VYNOVA Group

ANNEX TO INDUSTRY CHARTER FOR PRODUCTION OF VCM AND PVC

(Reference: ECVM Best Available Techniques)

ENVIRONMENTAL STANDARDS FOR EDC AND VCM PRODUCTION

Emission Limits for all Vent-Gas (averages over the sampling period at 11 vol-% O₂):

Sum of VCM and EDC from thermal oxidisers	<	1 mg/Nm ³
Sum of VCM and EDC from catalytic oxidisers	<	5 mg/Nm ³
HCl	<	10 mg/Nm ³
Total volatile organic compounds for thermal oxidisers	<	5 mg/Nm ³
Total volatile organic compounds for catalytic oxidisers	<	10 mg/Nm ³
Dioxin-like components	<	0.08 ng TEQ/Nm ³

Discharge Limits for Total of Aqueous Effluents to a receiving water body (yearly averages):

EDC	<	0.05 g/ton of purified EDC
Copper	<	0.2 g/ton of EDC produced by oxychlorination
Dioxin-like components	<	0.3 µg TEQ/ton of EDC produced by oxychlorination

ENVIRONMENTAL STANDARDS FOR PVC PRODUCTION (SUSPENSION PROCESS)

Total VCM-emission from PVC-production	<	45 g/ton of S-PVC produced
VCM emission into aqueous effluents	<	1.5 g/ton of S-PVC produced

(Both averaged over one year)

VCM-concentration in final PVC resin	<	1 g/ton of S-PVC
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(At least 90 % of measurements below the limit. Minimum 1 sample/day for food/medical applications.
Minimum 1 sample/week for general purpose applications)

ENVIRONMENTAL STANDARDS FOR PVC PRODUCTION (EMULSION PROCESS; also applies to Microsuspension-PVC)

Total VCM-emission in the air	<	500 g/ton of E-PVC produced
VCM-emission into aqueous effluents	<	8 g/ton of E-PVC produced

(Both averaged over one year)

VCM-concentration in final PVC resin	<	1 g/ton of E-PVC
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(At least 90 % of measurements below the limit. Minimum 1 sample/day for food/medical applications.
Minimum 1 sample/week for general purpose applications)

OCCUPATIONAL EXPOSURE STANDARD

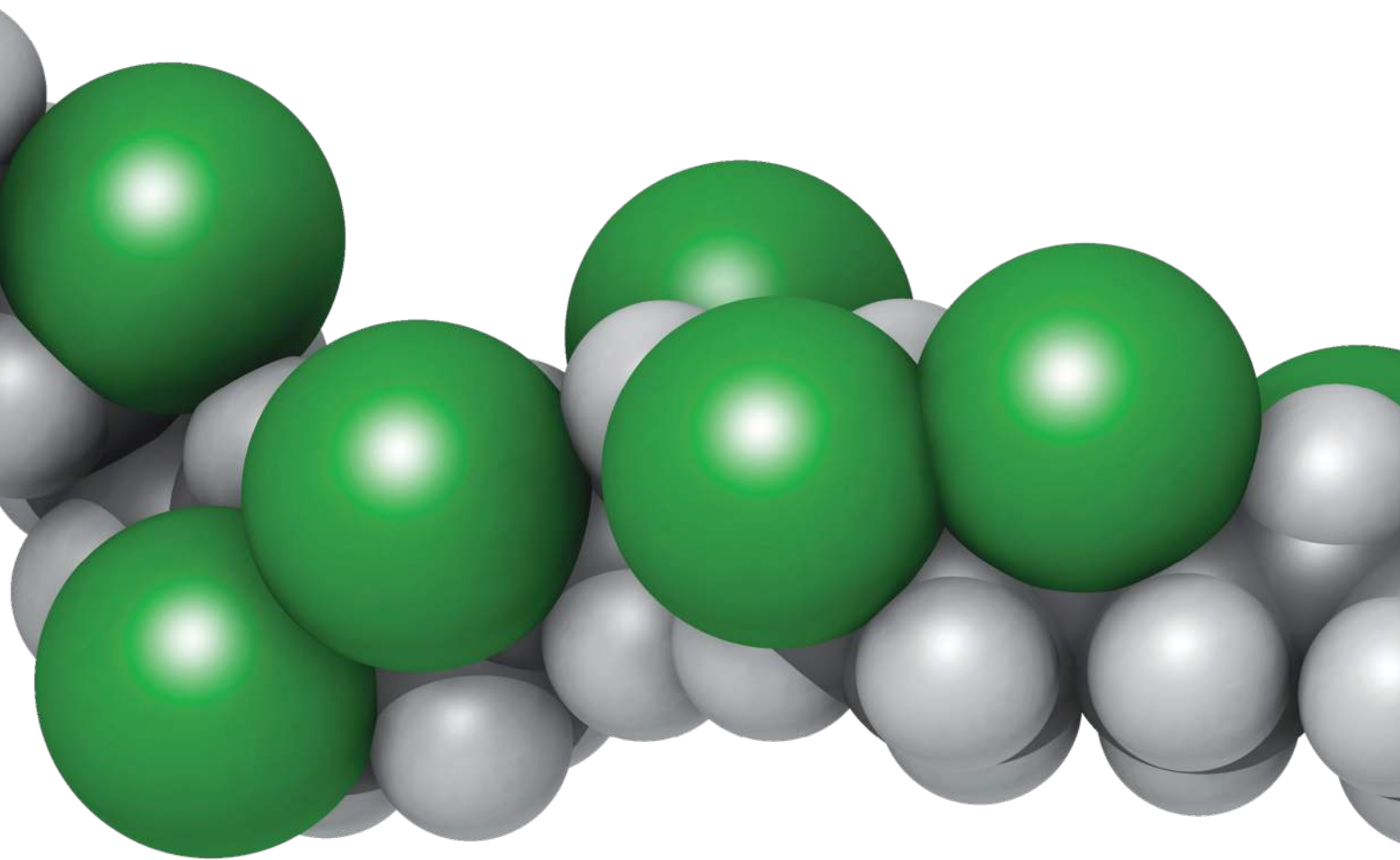
95 % of plant workers' personal VCM exposure monitoring measurements during normal operations below 1 ppm.

The European Council of Vinyl Manufacturers

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 @ecvm_pvc



www.pvc.org