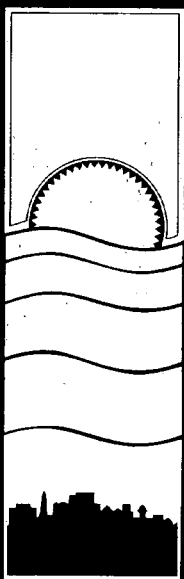


CCME

Canadian Council of Ministers of the Environment / Le Conseil canadien des ministres de l'environnement

**NATIONAL STANDARDS
FOR THE
VOLATILE ORGANIC COMPOUND CONTENT
OF
CANADIAN COMMERCIAL/INDUSTRIAL
SURFACE COATING PRODUCTS
-
AUTOMOTIVE REFINISHING**



OCTOBER 1998
PN1288

The Canadian Council of Ministers of the Environment (CCME) is the major intergovernmental forum in Canada for discussion and joint action on environmental issues of national, international and global concern. The 13 member governments work as partners in developing nationally consistent environmental standards, practices and legislation.

Canadian Council of Ministers of the Environment
123 Main Street, Suite 360
Winnipeg, Manitoba
R3C 1A3
Tel: (204) 948-2090
Fax: (204) 948-2125

For additional copies, please contact:

CCME Documents
c/o Manitoba Statutory Publications
200 Vaughan Street
Winnipeg, Manitoba
Tel: (204) 945-4664
Fax: (204) 945-7172
E-mail: spccme@chc.gov.mb.ca

Comments regarding the content of this document and the contribution of material developed to implement it would be greatly appreciated. A master file containing comments and including submission of new material will be maintained by Environment Canada. Please send your contributions to:

Chemical Industries Division
National Office of Pollution Prevention
Toxics Pollution Prevention Directorate
Environment Canada
Ottawa, Canada
K1A 0H3
Tel: (819) 953-1607
Fax: (819) 953-5595

Prepared by
the Technical Sub Group for the Reduction of VOCs
from Canadian Automotive Refinish Operations
for the
CCME Working Group for Surface Coating Initiatives

NO_x/VOC Phase I Management Plan
Initiative V307

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1.0 INTRODUCTION

1.1 Background

The standards contained in this document are designed to limit the volatile organic compound (VOC) content of surface coating products used by Canadian commercial/industrial automotive refinishers or refurbishers.

The standards were developed by Technical Sub Group (Appendix A) for a multi-stakeholder CCME Working Group (Appendix B) made up of representatives from federal, provincial governments, industry and environment non-government organizations. The contributions of all participants and stakeholders who helped develop these guidelines are gratefully acknowledged.

While these standards and guidelines establish maximum broad national emission limits, it is acknowledged that federal, provincial/territorial or regional environmental authorities may impose more stringent limits in response to regional or local problems.

The CCME Management Plan for Nitrogen Oxides and Volatile Organic Compounds has the objective of reducing ground level ozone to 82 ppb in all parts of Canada by 2005. The CCME Plan comprises three phases.

Under Phase I, interim reduction targets are to be set and implemented. These interim targets are not expected to fully resolve ozone problems or necessarily achieve the final 82 ppb target for ground level ozone. The Plan is to put in place a strong prevention program, the National Prevention Program (NPP), a comprehensive Regional Remedial Program (RRP) for Non-Attainment Areas (NAA) and a series of studies to provide a base to permit establishment of emission caps. Interim targets were to be set for 1995 and 2000. These interim targets are to be negotiated by the federal government and the jurisdiction(s) responsible for the designated NAA. The remedial programs will be determined and implemented by the responsible jurisdiction. The NPP may be viewed as dealing with new sources while the RRP deals with existing sources. The NPP is to be developed jointly by the Federal government and the provinces.

The regions identified as NAA are areas where it was not believed possible to specify final emission caps because of insufficient information on emissions, cause and effect relationships and the effect of trans-border contributions on the ozone levels. For this reason, the interim targets are specified as percentage reductions from a base year. The NAAs are the Lower Fraser Valley (LFV); the Windsor Quebec City Corridor (WQC) and the St. John, NB area (SJA).

Under Phase II the final NO_x/VOC targets for 2000 and 2005 are to be established. The 2005 targets are to yield 82 ppb ozone and can include additional measures to meet targets if required.

Under Phase III, the final adjustments and measures to fully achieve 82 ppb ozone are to be selected and implemented.

1.2 The Automotive Refinish Industry

The automotive refinish market is that subsector of commercial/industrial coatings operations that deals with the repair, refinishing or refurbishing of motor vehicles. Body builders, which manufacture cargo "boxes" and cargo trailers and manufacturers of heavy duty OEM trucks and buses, use products that are similar, and in some instances identical, to those used by automotive refinish facilities. Standards for surface coating products used by coating facilities and operations of body builders and OEM manufacturers of heavy duty trucks and buses, which are considered distinct and separate subsectors in the CCME Plan, are not included in this document.

The focus of this standard is on VOC emissions released by the painting and related operations required for the restoration of damaged or replaced body components. Refinishing required because of deterioration from aging, weathering or rusting is also included although, in Canada, this segment of automotive refinishing operations is comparatively small.

The automotive refinish subsector is composed of over 7000 facilities that are distributed across Canada in approximate agreement with the distribution of population (and vehicles). As might therefore be expected, the VOCs emitted by these facilities are also concentrated in the Canadian non-attainment areas. Automotive refinish facilities range from very small, one man operations to ones having 25 or more employees. Capitalization ranges from a few thousand, or even hundreds of dollars, to several hundred thousand dollars. This is in sharp contrast to some other industrial coating facilities such as the automotive OEM industry that is concentrated in the Windsor-Quebec corridor and consists of 13 operations each of which employs several thousand individuals in highly capitalized and automated facilities costing hundreds of millions of dollars. In addition to the disparity in number, size and distribution of facilities, the two subsectors also differ in the types of products used and application and drying equipment and processes. These differences are dictated by a combination of the nature of the operation, the state of assembly of the vehicle at the time of painting (pre-assembly for OEM, fully assembled for refinishing) and by the very limited capital resources of most automotive refinishers. As a result of these differences, the standards that have been developed for this sector focus on coating products as opposed to VOC emission performance standards and guidelines that were developed for the automotive OEM coating operations. While the former approach is more prescriptive, it is believed to be the only practical way to effectively reduce VOC emissions from this sector.

The suppliers of refinish coatings are generally well resourced multi-national firms viz. AKZO, American Standox, BASF, Dupont, ICI, PPG and Sherwin-Williams. It is estimated that these companies supply over 95% of US and Canadian refinish paint requirements. Less than half of these companies manufacture refinish coatings in Canada and then not necessarily the complete refinish product range. The other companies are active suppliers of coatings to the Canadian market using products imported from the USA or Europe. In the USA, there are a few smaller, regional suppliers who may be exporting into Canada as well. Other, small, Canadian manufacturers supply specialty and ancillary products such as special coatings and thinners.

The numerous regulations in the USA and Europe, either already on the books or in the process of becoming law, require the use of lower VOC coatings. The existence of these regulations tends to favour the larger coatings suppliers who have the resources necessary to develop the more technologically sophisticated coatings.

Canada has benefited from the US regulations requiring lower VOC products. Because of standardization of products, at least some of the coatings manufactured in Canada by US based multi-nationals or imported into Canada from the USA may already meet the stricter VOC content regulations of that country. This may be expected to continue with future reductions in VOCs in products developed to meet US regulations.

2.0 ABBREVIATIONS AND GLOSSARY

2.1 Abbreviations

AIA	Automobile Industries Association
ASTM	American Society for Testing and Materials
BACTEA	Best Available Control Technology Economically Achievable
CCME	Canadian Council of Ministers of the Environment
CFC	Chlorofluorocarbon
EPA	US Environmental Protection Agency
FC	Fluorocarbon
HCFC	Hydrochlorofluorocarbon
LFV	Lower Fraser Valley, British Columbia
NAA	Non-attainment Area (CCME, Phase I)
NOx	Nitrogen oxides
NPP	National Prevention Program (CCME, Phase I)
OEM	Original equipment manufacturer
RRP	Regional Remedial Program (CCME, Phase I)
SAR	Southern Atlantic Region
SJR	Saint John Region, New Brunswick
VOC	Volatile organic compound
WQC	Windsor-Quebec Corridor

2.2 Glossary

Additives	See discretionary additives.
Adhesion promoter	A coating used to facilitate the bonding of a primer or topcoat on surfaces such as trim moldings, door locks, and door sills, where sanding is impracticable, and on plastic parts and the edges of sanded areas.
Anti-glare coating	A low gloss coating used to minimize glare for safety purposes on the interior surfaces of a vehicle.
Applied solids	Coating solids that remain on the substrate being coated after curing.
As applied	The condition of a coating at the time of application to the substrate, as prepared according to the product manufacturer's or components supplier's normal mixing instructions, and including all components such as dilution solvents; i.e., reducers and thinners, reactive constituents; i.e., catalysts and hardeners, and additives.
As supplied	The condition of a coating, product or component as sold by the manufacturer or importer.
Automotive refinishing	The application of coatings to motor vehicles or their parts that is subsequent to the original coating applied at an original equipment manufacturing plant.
Basecoat	A pigmented, coloured coating used as the first layer of a topcoat system.
Basecoat/clearcoat system	A topcoat system composed of a basecoat layer(s) and a transparent clearcoat layer(s).
Catalyst	An additive used in conjunction with a primary product for the purpose of improving cure, increasing the rate of cure or improving the performance or resistance properties of the primary product without reacting and becoming a part of the film.
Coating	A film forming material used for the decoration and/or protection of the surfaces of an object. Coatings include, but are not limited to lacquers, enamels, elastomeric materials, primers, primer surfacers, basecoats, midcoats and clearcoats.
Coating supplier	See Refinish products supplier.
Components	Reducers, hardeners, catalysts or additives for use with primary products used for automotive refinishing.
Component supplier	The manufacturer or importer of components intended for use with the automotive refinishing primary products of other manufacturers.
Container	An individual receptacle that holds a coating for storage and distribution.
Discretionary additives	Additives used with primary products that are not essential for the use of the primary product but which may be added to achieve specific desired performance or appearance modification.
Elastomeric coatings	Coatings that are specially formulated for application over flexible parts, such as elastomeric bumpers.
Enamel	A coating that undergoes additional polymerization or film-forming reaction

	after application to the substrate.
Exempt volatiles	Specific volatile organic compounds that, for the purpose of this standard, are not considered volatile organic compounds (VOCs) due to their negligible photochemical reactivity. See VOC.
Four stage coating system	See multi-stage coating system.
Gloss flattener	A coating that is used to remove luster from topcoats.
Hardener	A component used in conjunction with a primary product and reacting with it for the purpose of curing the film, increasing the speed of cure or improving the performance or resistance properties.
Label	Any written, printed, or graphic matter affixed to or appearing upon any automotive refinish product container for purposes of identifying or giving information on the product, use of the product, or contents of the container.
Lacquer	A coating that does not undergo additional polymerization or film forming reaction after application to the substrate.
Midcoat	Translucent, or specially coloured coating(s) that are applied as a separate layer(s) between basecoats and clearcoats for special colour effects.
Mixing instructions	The product manufacturer's specification of the quantities of dilution solvent, reactive components and/or additives that are added to a coating to prepare it for application.
Motor vehicles	All automobiles, light duty trucks, medium duty vehicles, heavy duty vehicles, trailers, equipment or utility vehicles used for the transportation of people or property.
Multi-stage coating system	A topcoat system composed of a pigmented coloured basecoat, one or more coloured or iridescent semi-transparent mid-coats and a transparent clearcoat.
Panel repair	A repair in which the entire surface of a component such as a fender is coated, leaving none of the original surface exposed.
Pretreatment wash primer	A primer that contains a minimum of 0.5% acid, by weight, that is applied at a very low film thickness (~0.2 mils dry film thickness) directly to bare metal to provide corrosion resistance and promote adhesion of subsequent topcoats.
Primer	A coating applied prior to the application of a topcoat for the purpose of corrosion resistance and/or to promote adhesion.
Primary product	The product as sold before the addition of reducers, hardeners, catalyst, or other additives.

Primer sealer	A coating applied prior to the application of a topcoat for the purpose of corrosion resistance, adhesion of the topcoat, and/or colour uniformity and to promote the ability of an undercoat to resist penetration by the topcoat.
Primer surfacer	A coating applied prior to the application of a topcoat for the purpose of filling surface imperfections in the substrate, corrosion resistance, and/or to promote adhesion of the topcoat. Anti-chip coatings applied to areas subject to stone chipping are included in this product category.
Reducer	A solvent or blend of solvents added to a coating to adjust the viscosity of the coating for application. Generally used to describe solvent(s) used to adjust enamels or other coatings.
Refinish Products	Coatings, including but not limited to primary products, required components, thinners, reducers, cleaners and additives used for the automotive refinishing.
Refinish product supplier	The manufacturer or importer of refinish products for use in automotive refinishing. Component suppliers are included in this definition.
Single-stage topcoat	A topcoat consisting of only one coating.
Solvent-borne coating	One that contains 5% or less of its volatile constituents as water, the remainder being organic solvent.
Specialty coatings	Unique coatings and compliant coatings with additives that are necessary due to unusual job performance requirements. Specialty coatings include, but are not limited to adhesion promoters, uniform finish blenders, elastomeric materials, gloss flatteners and bright metal trim repair, anti-glare/safety coatings and single stage lacquers used solely for the restoration of classic and antique automobiles.
Spot repair	A repair done on only a portion of a component such as a fender, the balance of the component's surface retaining the original finish.
Standard	A product, process or performance standard.
Substrate	The surface to which the coating is applied. May be metal, plastic or previously applied coatings.
Surface cleaners	Surface preparation materials used to remove foreign matter and contaminants such as wax, tar, grease and silicones from the surface to be coated. Equipment cleaning solvents are not included in this definition.
Thinner	Effectively the same as reducer. Generally used to describe solvent(s) used to adjust lacquers or other coatings.
Three-stage coating system	See Multi-stage coating system.

Topcoat	The final coating or series of coatings applied to a surface primarily for aesthetic reasons, especially colour and appearance.
Touch-up coating	A coating applied by brush or hand-held, non-refillable aerosol cans to minor surface damage and imperfections.
Two-stage topcoat	A topcoat consisting of a pigmented basecoat and a transparent clearcoat. See basecoat/clearcoat system.
Uniform finish blender	A solvent blend or low solids clear solution used to "melt" overspray between a repaired and unrepaired area. Used primarily for spot repairs.
VOC	For the purpose of this standard any organic compound that participates in atmospheric photochemical reactions; that is any organic compound other than those listed below which have been excluded because of their negligible photochemical reactivity: Acetone, Methane, Ethane, Methyl chloroform, Methylene chloride, Parachlorobenzotrifluoride, CFC-113 (trichlorotrifluoroethane), CFC-114 (dichlorotetrafluoroethane), CFC-115 (chloropentafluoroethane), CFC-11 (trichlorofluoromethane), CFC-12 (dichlorodifluoromethane), CFC-22 (chlorodifluoromethane), FC-23 (trifluoromethane), HCFC-123 (dichlorotrifluoroethane), HCFC-141b (dichlorofluoroethane), HCFC-142b (chlorodifluoroethane), HFC-134a (tetrafluoroethane).
Volume Solids	The proportion of a volume of coating that is not volatile and constitutes the actual final coating remaining on the surface after application and curing.
Waterborne coating	One that, as supplied and applied, contains more than 5% of its volatile fraction as water.
Water reducible coating	One that as applied, contains more than 5% of its volatile fraction as water. May contain less than 5% water as supplied.
Weld-through primer	A primer that is applied to an area before welding is performed, and that provides corrosion resistance to the surface after welding has been performed.

3.0 STANDARDS

3.1 Principles

Product standards limiting the volatile content of automotive refinishing surface coating products are based on the following principles.

1. The standards achieve reductions in VOCs consistent with the targets of the CCME Management Plan for NO_x and VOCs for commercial/industrial coatings application facilities.
2. The standards are based on the Best Available Control Technology Economically Achievable (BACTEA).
3. The standards are expressed in the simplest possible form while remaining effective.
4. The standards and the determination of compliance are clearly defined.
5. Implementation of the standards is compatible with and supportive of the objectives and concept of pollution prevention.
6. Implementation of the standards will not contribute significantly to the generation of greenhouse gases and other pollutants such as NO_x and are therefore compatible with government commitments in this regard.
8. The standards are comparable with those of the USA.

3.2 Product Standards

3.2.1 VOC Content Limits

Manufacturers and importers of automotive refinish products shall limit the VOC content, as applied, of each automotive refinish product manufactured or imported for use in Canada to the following:

Surface cleaner	- Plastic substrates	780 grams/litre
	- Metal & other substrates	200 grams/litre
Pretreatment primers		780 grams/litre
Primer surfacers		575 grams/litre
Primer sealers		550 grams/litre
Single-stage and two-stage topcoats		600 grams/litre
Multi-stage topcoats of more than two stages		625 grams/litre
Specialty coatings		840 grams/litre

Note: If an automotive refinish product is suitable for use in one or more of the above categories, then the lowest VOC content limit shall apply for that product.

3.2.2 Compliance Criteria

The automotive refinish products subject to the VOC content limits are defined “as applied”. In most cases, this is not “as supplied”. The primary product is usually adjusted for viscosity by the addition of VOC containing reducers to render it suitable for application. In many cases, it also requires the addition of a VOC containing additive such as a hardener or catalyst to cure to a resistant film. To determine compliance, the VOC content of the product is calculated after all reducers and additives are incorporated into the product based on the coating manufacturer’s specifications.

Refinish coatings may be used with VOC containing reducers, thinners and additives from a component supplier in place of those specified by the manufacturer of the primary product. It is the component supplier’s responsibility to determine that the use of their component as recommended does not result in the product, as applied, exceeding the VOC contents set out in Section 3.2.1. The component supplier must provide, on request, documentation supporting this compliance.

The above requirements are also applicable to the use of discretionary additives whether supplied by the primary product supplier or the component supplier.

Certain deposits and stains resist removal by the proposed low VOC content cleaners. To remove these deposits, the application of conventional high VOC content solvents may be used provided that the solvent is applied from an appropriate hand held spray bottle and their application is limited to the difficult-to-remove stain.

3.2.3 Calculation of Volatile Content

The volatile content of automotive refinish products or components in grams per litre shall be determined by any of the following methods:

1. ASTM Test Method D-3960;
2. US EPA Reference Method 24 (CFR Title 40, Part 60, Appendix A); or
3. The theoretical total volatile content of the product or component derived from the theoretical product or component formula.

3.2.4 Calculation of VOC Content

The VOC content of automotive refinish coatings as applied and their primary products or components shall be calculated according to the following equations:

3.2.4.1 Primary products or components containing water and/or exempt volatile organic compounds:

$$\text{VOC}_{\text{Prod}} = \frac{W_{\text{VOL}} - W_{\text{EX}} - W_{\text{W}}}{1 - V_{\text{EX}} - V_{\text{W}}}$$

where:

VOC_{Prod}	is the VOC content of the primary product or component in g/l;
W_{VOL}	is the total weight of volatiles per litre of primary product or component in grams;
W_{EX}	is the weight of exempt volatiles per litre of primary product or component in grams;
W_{W}	is the weight of water per litre of primary product or component in grams;
V_{EX}	is the volume of exempt volatiles per litre of primary product or component in litres; and
V_{W}	is the volume of water per litre of primary product or component in litres.

3.2.4.2 Reducer or thinner:

$$VOC_{Red} = W_{VOL} - W_{EX} - W_W$$

where:

VOC_{Red} is the VOC content of the reducer or thinner as applied in g/l;
 W_{VOL} is the total weight of volatiles per litre of reducer or thinner as applied in grams;
 W_{EX} is the weight of exempt volatiles per litre of reducer or thinner as applied in grams; and
 W_W is the weight of water per litre of reducer or thinner as applied in grams.

3.2.4.3 Single-stage systems including primers, primer surfacers, primer sealers, single-stage topcoats and specialty coatings:

$$VOC_{Ctg} = A\% \times VOC_A + B\% \times VOC_B + C\% \times VOC_{Red} \dots etc.$$

where:

VOC_{Ctg} is the VOC content of the coating as applied, in grams/litre (g/l);
 VOC_A is the VOC content of the primary product or component in g/l;
 VOC_B is the VOC content of additional products or components in g/l;
 VOC_{Red} is the VOC content of the reducer/thinner in g/l;
 $A\%$ is the % volume of the primary product or component in the mixture as applied;
 $B\%$ is the % volume of additional products or components in the mixture as applied; and
 $C\%$ is the % volume of the reducer/thinner in the mixture as applied.

Note: Additional products, components or additives are to be included in the calculation as Component D,E, etc. and treated as other constituents in the mixture.
If a range is recommended for any additions such as thinner, reducer, etc., then the highest value in the range is used to calculate the VOC content of the additional product or component.

3.2.4.4 Basecoat/clearcoat systems:

$$VOC_{BC/CC} = \frac{VOC_{BC} + 2(VOC_{CC})}{3}$$

where:

$VOC_{BC/CC}$ is the VOC content of the basecoat clearcoat system as applied in g/l.;
 VOC_{BC} is the VOC content of the basecoat as applied and calculated for a single-stage system in section 3.2.4.3; and
 VOC_{CC} is the VOC content of the clearcoat as applied and calculated for a single-stage or two-stage system in section 3.2.4.3.

3.2.4.5 Multi-stage topcoat systems comprising of more than 2 stages:

$$\text{VOC}_{\text{MS}} = \frac{\text{VOC}_{\text{BC}} + \text{VOC}_{\text{MC1}} + \text{VOC}_{\text{MC2}} + 2(\text{VOC}_{\text{CC}})}{M + 3}$$

where:

VOC_{MS}	is the VOC content of the multi-stage coating topcoat system as applied in g/l;
VOC_{BC}	is the VOC content of basecoat as applied in g/l as calculated in 3.2.4.3 or 3.2.4.4;
VOC_{MC1}	is the VOC content of the first midcoat as applied in g/l as calculated in 3.2.4.3;
VOC_{MC2}	is the VOC content of the second midcoat as applied in g/l as calculated in 3.2.4.3;
VOC_{CC}	is the VOC content of the clearcoat as applied in g/l as calculated in 3.2.4.3 or 3.2.4.4; and
M	is the number of mid-coats.

Note: Additional mid-coats are incorporated in the equation in the same way as mid-coats 1 and 2.

3.2.4.6 Surface cleaners:

$$\text{VOC}_{\text{Cleaner}} = W_{\text{VOL}} - W_{\text{EX}} - W_{\text{W}}$$

where:

$\text{VOC}_{\text{Cleaner}}$	is the VOC content of the cleaner as applied in g/l;
W_{VOL}	is the total weight of volatiles per litre of cleaner as applied in grams;
W_{EX}	is the weight of exempt volatiles per litre of cleaner as applied in grams; and
W_{W}	is the weight of water per litre of cleaner as applied in grams.

3.2.5 Effective Dates

Effective July 1, 1998, only automotive refinish products and ancillary products that comply with the VOC content limits shown in 3.2.1 shall be manufactured in or imported into Canada for use in Canada.

3.2.6 Labeling Requirements

Manufacturers and importers of automotive refinish coatings shall include on the label or container of all automotive refinish coatings the date of manufacture of the contents or a code indicating the date of manufacture.

3.2.7 Reporting Requirements

Each manufacturer and importer of automotive refinish products subject to the VOC limits in this standard, manufactured or imported for use in Canada, shall submit an initial report to the appropriate provincial, territorial or regional jurisdiction when determined by the jurisdiction, or within a time period determined by the jurisdiction of the date of first manufacture or importation of the automotive refinish product.

The initial report shall include, at a minimum, the following information:

- 1) The name and mailing address of the manufacturer or importer;

- 2) Signature of the responsible official and the name and title of the designated contact person;
- 3) Product brand name and category;
- 4) Product mixing instructions as stated on the container or in literature supplied with the product;
- 5) Maximum VOC content of the product as applied after mixing according to the manufacturer's instructions;
- 6) An explanation, in cases where date codes are used to represent the date of manufacture, of each date code; and
- 7) Any other requirements specified by the jurisdiction.

3.2.8 Review of Product Standards

The product standards are to be reviewed in the year 2003 for possible revision in the light of advances in technology.

APPENDIX A - TECHNICAL SUBGROUP MEMBERS

Chair

Rick Loughlin - Environment Canada

Refinishers

John Norris - Hamilton District Autobody Repair Association (HARA)
Alex Szabo - HARA
Tony Nigro - HARA

Coating Suppliers

Tim Loden - Akzo Canada Inc.
Jennifer Hackney - American Standox
Herb Morrison - BASF Canada Inc.
Bradley Richards - BASF Corporation
Richard Murry - Canadian Paint and Coatings Association (CPCA)
Elizabeth Thompson - DuPont Canada Inc.
George Esterer - Endura Manufacturing Company Limited
Ken Hine - ICI Autocolor
Jim Kantola - ICI Autocolor
Jim Slosnerick - PPG Canada Inc.
Marc Kreuzer - The Sherwin-Williams Company

Equipment Suppliers

David Gavura - Accuspray Canada Inc.
Larry King - Caruk & Associates Limited
Robert Derby - Caruk & Associates Limited
Frank Wagner - Safety-Kleen
Michael Callahan - Safety-Kleen
Jeff Parker - ITW DeVilbiss
Ron Carter - ITW DeVilbiss
Mark Miller - ITW DeVilbiss
Victor Hawes - Uni-Ram Corporation
Christian Bunk - SATA, Farbespritztechnik GmbH
Bob Rivard - Eurotech Spray Products Limited

Others

Dean Wilson - AIA
Keith McGrone - I-CAR
Brian LeClair - Ministry of Environment & Energy Ontario (MOEE)
Michael Giannotti - MOEE
Jacob Shapiro - Shapiro & Associates
Charles Kaufmann - Shapiro & Associates
Douglas Thiermann - Shapiro & Associates

APPENDIX B - CCME WORKING GROUP PARTICIPATING AND CORRESPONDING MEMBERS

Chair

Rick Loughlin - Environment Canada

Participating Members

Ilse S. Bacchus - PPG Canada Inc.
Gillian Clarke - ICI Autocolor
Jay Clyde - Corrosion Service Co. Limited
Peter Corbyn - Automotive Parts Manufacturers Association (APMA)
Tass Eilert - General Motors of Canada Limited
Raye Fraser - Railway Association of Canada
Paul Hansen - Chrysler Canada
Ken Hine - ICI Autocolor
William (Bill) Hockett - General Motors of Canada Limited
John Irwin - Sico Inc.
James Klys - Pierce & Stevens Canada
Brian LeClair - Ontario Ministry of Environment & Energy (MOEE)
Patricia Mason - Honda of Canada Mfg., Inc.
Richard Murry - Canadian Paint & Coatings Association (CPCA)
John Norris - Hamilton District Autobody Repair Association (HARA)
Jean Patry - Kremlin Canada Limited
James Slosnerick - PPG Canada Inc.
Andrew Studley - Esso Chemicals Canada
Carol Taillon - Les Peintures Acralum Inc.
R. Taylor - Baycoat
Elizabeth Thompson - DuPont Canada Inc.

Corresponding Members

Nadine Allemand - CITEPA
John Baguzis - Ford Motor Company
Jean-François Banville - Quebec Region, Environment Canada
Bob Beaty - BC Environment
Denis Begin - Universite de Montreal
J. Beshai - National Defence, HQ
Tim Bissonnette - Saskatchewan Autobody Association
E. Bobet - Ontario Region, Environment Canada
O. Brock - Ford New Holland Canada, Limited
Henry Broderson - Automotive Trades Association
Julio Bruno - Glen Merritt Collision
Christian Bunk - SATA Farbespritztechnik GmbH
Keith Burns - PPG Canada Inc.
Guy Caissie - Guy's Collision
Michael Callahan - Safety-Kleen Corporation
Ron Carter - ITW DeVilbiss
Brian Champken - Automotive Refinish Technologies
Bruce Caswell - CCPA
Caucus Coordinator - Canadian Environmental Network
Maryse Comtois - CAMI Automotive Inc.
Bill Crocker - Bovar Environmental
Ralph D'Alessandro - 427 Auto Collision
Robert Dalgleish - Trafalgar Collision
Robert Derby - Caruk & Associates Limited
Marc G. Deslauriers - Environment Canada

Tony Di Santo	-	Florida Garage
Joanne Dicaro	-	MOEE
Tony Ennis	-	Saskatchewan Association of Automotive Repairs
Bob Ernst	-	I-CAR Technical Center
Gerry Ertel	-	Shell Canada Products Limited
George Esterer	-	Endura Mfg. Co. Ltd.
Marty Exon	-	BASF Canada Ltd.
Alan Fairchild	-	DeVilbiss Spray Equipment
Rod Firth	-	Prairie & Northern Region, Environment Canada
Dave Gavura	-	Accuspray Canada Inc.
Michael Giannotti	-	MOEE
Omer Girardin	-	BECCA Recycling Technologies
E. Gismondi	-	Caledon Controls
Alain Gosselin	-	Quebec Region, Environment Canada
Andrew Green	-	Environment Canada
Denis Guay	-	Mouvement Carrossiers Quebec
Charles Guertin	-	Guertin Bros. Coatings & Sealants Limited
Jennifer A. Hackney	-	American Standox Inc.
Brian Harper	-	Bodyshop Magazine
Patrick Hasse	-	Wagner Systems Inc.
Victor Hawes	-	Uni-ram Corporation
Peter Hernandez	-	US Consulate
William (Bill) Hockett	-	General Motors of Canada Limited
Roger Hodges	-	Saskatchewan Environment and Public Safety
Michael J. Jacklin	-	BASF Canada Inc.
Nadine James	-	G.E. Canada
K. Johnstone	-	Pacific Region, Environment Canada
Jim Judge	-	Accuspray Canada
James R. Kantola	-	ICI Autocolor
Dawn Karnes	-	Western Star Trucks Inc.
Charles Kaufmann	-	Shapiro & Associates
Larry Kelly	-	Kelly Auto Body
Eduard Kemenoff	-	Summit Collision - Carstar
Roy Kennedy	-	BASF Canada Inc.
Larry King	-	Caruk & Associates Limited
J.F.L. (Jim) Knight	-	New Brunswick Department of Environment
Joe Kozak	-	Atlantic Region, Environment Canada
David Lancaster	-	Thermovault Systems Inc.
Lionel Laurin	-	Ottawa Carleton Collision Society
Martin Lecours	-	Environment Quebec
Lynn Leger	-	DuPont Canada Inc.
Chow-Seng Liu	-	Alberta Environment
Tim Loden	-	Akzo Coatings Canada
Tim Loth	-	Loth Auto Body
Bill Macpherson	-	BC Environment
Rick MacDonald	-	Campbell Autoshop Ltd.
Mick MacDonald	-	Kelsey Institute
Dale Mader	-	RGDA of Nova Scotia
Dale Mader	-	RGDA of PEI
Paul Marriott	-	DuPont Canada Inc.
Greg G. Martin	-	General Motors of Canada Limited
Keith McCrone	-	I-CAR
Robert McDonald	-	ICI Paints (Canada) Inc.
Ian McEwan	-	Schomberg, Ontario
John McEwen	-	Unionville, Ontario
Mark McNeil	-	Hamilton Spectator
Tony Mercanti	-	Ontario Auto Collision - Carstar
Dieter Merk	-	Bayer Inc.

P.G. Miasek	-	Esso Chemicals Canada
Mark Miller	-	ITW DeVilbiss
Mark Mollot	-	Duha Color Services
Mark Morris	-	US EPA - Research Triangle Park
Herb Morrison	-	BASF Canada Inc.
Ted Morton	-	John E. Goudey Manufacturing Limited
Brendan Murphy	-	PEI Environment
Tony Nigro	-	Wentworth Collision
John Noonan	-	Valspar Inc.
Gregory P. Ocampo	-	Sherwin-Williams Company
Jeff Parker	-	ITW DeVilbiss
Pierre Pinault	-	Environment Canada
R. Pineau	-	Binks Manufacturing
Claude Pronovost	-	Point Claire, P.Q.
Roger Quan	-	Greater Vancouver Regional District
Kevin Reeve	-	Manitoba Environment
Tova Reinhorn	-	Occidental Chemical Corporation
Bradley M. Richards	-	BASF Corporation
Bob Rivard	-	Eurotech Spray Products Ltd.
Reg Romero	-	Automotive Retailer
April Ryalen	-	Toyota Motor Manufacturing Canada Inc.
Paul Sajben	-	Alcan Enterprises
Jacob Shapiro	-	Shapiro & Associates
Lester E. Slocum	-	ABB Paint Finishing
Blake Smith	-	Ford Motor Co. of Canada, Limited
John Snyder	-	Mississauga, Ontario
Ron Solman	-	Environment Canada
Jennifer Speer	-	NEWALTA Corporation
Mike St. Germain	-	St. Germain Auto Pro Collision
Art Stelzig	-	Environment Canada
Patrick Stenson	-	Kingston Collision Centre
Alex Szabo	-	Dundas Valley Collision
Yashmin Tarmohamed	-	Canadian Vehicle Manufacturers' Association
Marjorie F. Tepina	-	MOEE
G.Ternan	-	Atlantic Region, Environment Canada
Diane Trayan	-	Energy & Environmental Analysis
Richard Trottier	-	CANMET - EMR
Tannis Tupper	-	Edmonton, Alberta
Richard Turle	-	Environment Canada
Dan Uszynski	-	Navistar International Corporation
Robert Vallance	-	CAMI Automotive Inc.
Jean Van Dusen	-	Manitoba Environment
Vladan Veljovec	-	Munters Corporation
Frank Wagner	-	Safety-Kleen Canada Ltd.
Andreas Walkembach	-	HERBERTS GmbH
Bruce Walker	-	STOP
Bob Wilke	-	Regina Autobody Association
Mike Wilson	-	Wilson Collision
Dean Wilson	-	Automotive Industries Association
Frank Witthoeft	-	BC Ministry of Environment
Ed Wituschek	-	Pacific & Yukon Region, Environment Canada
David Wolf	-	Dominion Colour Corporation
Peter Wong	-	MOEE
Yaro Zajac	-	Automotive Industries Association