PPG Industries

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23rd Jun, 2009

Legislative Council
Hong Kong Special Administrative Region of the People's Republic of China

To whom it may concern

Subject: Subcommittee on Air Pollution Control (Volatile Organic Compounds) (Amendment) Regulation 2009

Further to your fax dated 15th June 2009 that was sent to Mr. Fok of PPG Industries International, Inc. (Hong Kong branch), we are pleased to be invited to give further feedback on the proposed VOC legislation affecting vehicle refinishing.

PPG, as the world's largest supplier of transportation coating systems, understands and respects the regulations that are proposed by the Hong Kong Government to improve air quality and the general environment. PPG has worked closely with regulatory bodies and paint industry associations in all countries that have introduced VOC regulations.

During the early phase of the consultative process when the Hong Kong EPD was gathering feedback from paint companies and industry bodies that would be affected by VOC controls, PPG and a number of global coatings and chemical manufacturers represented by the Association of International Chemical Manufacturers (AICM) suggested that Hong Kong EPD consider the adoption VOC rules aligned to those of the European Paint Product Directive (PPD 2004/42) rather than those of the Californian Air Regulation Board (CARB 1151).

During our cooperative discussions with the Hong Kong EPD, we also received expressions of concern from motor body repair end users which supported our preference for Europe PPD type VOC regulations.

The major reasons of this preference area as follows:

More effective enviromental protection and better air quality

- PPG suggests that European PPD VOC regulations delivers better air quality compared to CARB regulations.

- European PPD regulations drive the use of waterborne basecoat as a replacment for solvent borne basecoat which is the critical component of the refinish paint system that affects VOC emissions.

- Waterbone basecoats are generally higher in solids and pigment content resulting in lower paint usage with a corresponding significant reduction in paint usage and solvent emission.

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- Using the calculations included as attached sheets 1 & 2, a strong case can be made that the MIR calculated ozone levels for a PPD compliant system are lower than for a CARB compliant paint system.

- High levels of relatively expensive exempt solvent contained in a paint formulation designed to meet CARB regulations may be offset by higher levels cheaper hydrocarbon solvent that have correspondingly higher MIR values.

- PPD regulations for primers, clearcoats and single stage topcoats drives the adoption of high solids solvent borne coatings technology with a corresponding significant reduction in paint usage and solvent emissions.

- CARB regulations do not necessarily drive the use of high solids products. Existing low solids solvent borne paint types can be made CARB compliant by the addition of exempt solvents which therefore give no benefit in reduced paint usage and total solvent emmsions.

- Higher solids solvent borne paints designed to meet PPD regulations are generally formulated with high levels of oxygenated solvents such as keones and esters with relatively low MIR values.

Safety

- PPD regualtions signifcantly reduce total solvent usage and emissions. The adverse health effects on workers in vehicle body repair shops caused by exposure to solvents are therefore greatly reduced.

- CARB compliant paint systems generally contain high levels of acetone used as an exempt solvent. Acetone has a very low flashpoint therefore increasing the risk of fire and explosion.

Popularization

- The European PPD regulations were introduced in April 2004 and implemented from Jan 2007. With the expansion of the EU, this legislation is in place in 27 countries and is proven on a very large scale. CARB legislation applies to the State of California, and was implemented at ‘Air District’ level – so far 4 districts have already adopted the legislation, 2 more in July 09 and 1 in Oct 09 - others are still considering. As such, this legislation is not yet fully proven to deliver the best air quality on a large scale.

Enforcement difficulties

It is difficult to measure the VOC of CARB regualted products because sophisticated test methods are required to distinguish exempt and non exempt solvents. This makes enforcement difficult and costly compared to PPD regulated products.

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Acceptance of products by end users

History

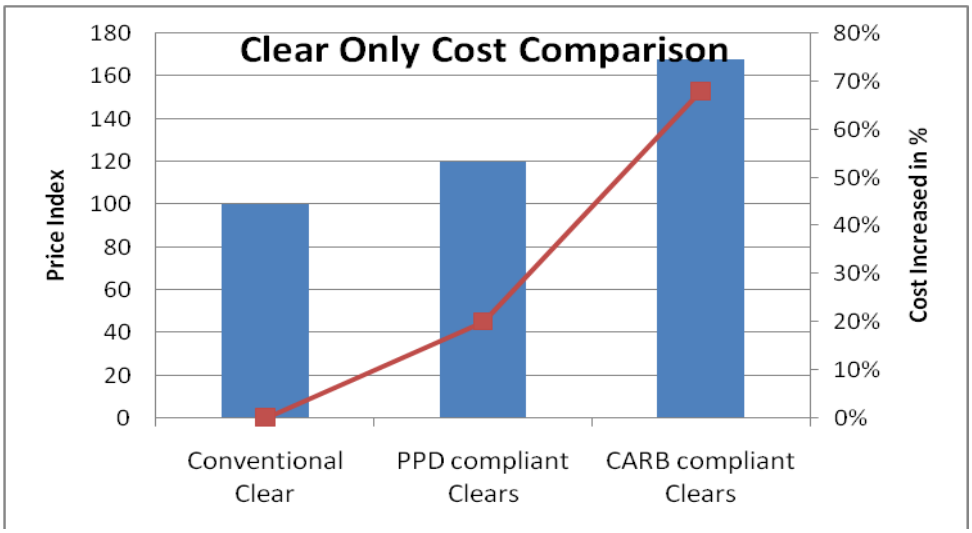
- Asia Pacific (including Hong Kong and China) has historically adopted similar automotive refinsihing products and technolgy to Europe. There are already PPD compliant products well established in the market place therefore making it easier and less costly for end users to comply with PPD type regulations.

Material Cost

- Both PPD and CARB compliant paint systems are higher in cost compared to conventional coatings.

- However, due to the high cost of expensive exempt solvents and relatively lower solid contents, CARB compliant coatings will add extra cost to the end user.

  Please refer to the two charts below showing the cost difference for the final paint user. The clearcoat can account for up to 50% of total paint consumption during a normal vehicle repair.



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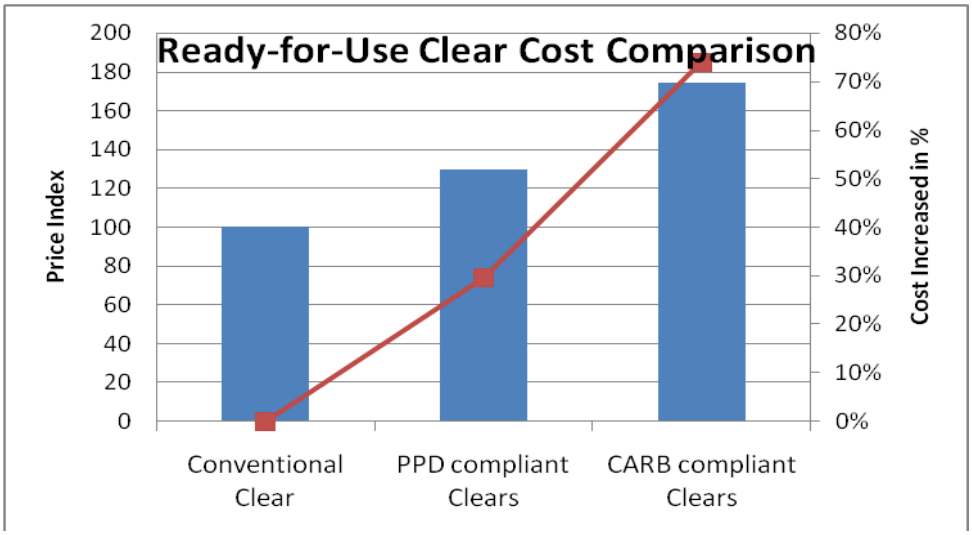

Less dependance on exempt solvent supply thus more stable supply

- The total amount of exempt solvent produced globally is significantly lower and dominated by few major suppliers. This means higher cost and high potential risk of material shortages to manufacturers of CARB compliant coatings. These increased costs would therefore be passed on to the end users.

The above statement is based on PPG's best knowledge and is provided in good faith. Based on information on hand, we see quite an amount of related industry organizations favoured the PPD legislation and had raised their opinion in different ways, i.e. International Paint Association (IPPIC).

PPG is committed to working with the Hong Kong government to achieve the best balance between improved air quality & work place environment and cost to the automotive refinishing industry.

We would therefore like to request your favorable consideration on the above proposal. Should you require further information or assistance, please do not hesitate to contact us.

With best regards,

Pauline Yuen

General Manager – Automotive Refinish, Architectural Coatings & Light Industrial Coatings

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Attachment 1 – **Enviromental effect comparison at basecoat level**

2K Basecoats			
Technology	**Standard SB Basecoat**	**CARB Solventborne Basecoat**	**PPD or CARB Waterborne Basecoat**
RFU Basecoat 1 litre (mls)	1,000	1,000	1,000
Contains Water?	No	No	Yes
Contains Exempt solvents?	No	Yes	No
VOC g/L (excluding water and exempt solvents)	810	420	420
Density of VOC in RFU paint	0.90	0.90	0.90
Density of Exempt solvent in RFU paint	-	1.07	-
Volume solids at RFU (% vol/vol)	10.00	20.00	16.00
Volume of solids at RFU (MLS)	100	200	160
Volume of VOC at RFU (MLS)	900	175	140
Volume of Exempt at RFU (MLS)	-	625	-
Volume of water (MLS)	-	-	700
Volume total solvent (VOC plus exempt) at RFU (mls)	900	800	140
Grams of Solids at RFU	115	230	184
Grams VOC solvent at RFU	810	158	126
Grams of Exempt Solvent at RFU	-	669	-
Grams of Water at RFU	-	-	700
Typical VOC Solvents	N-butyl acetate: xylene 1:1	N-butyl acetate: xylene 1:1	2-butoxy ethanol
Typical Exempt Solvents		acetone/parachloro benzotrifluoride 1:1	
MIR for VOC solvents excluding exempts	3.83	3.83	2.88
MIR for Exempt Solvents		0.27	
MIR Calctd GMS Ozone for VOCs Per Litre of RFU product (Excluding Exempts)	3,102	603	363
MIR Calctd GMS Ozone for Exempts Solvents Only Per Litre of RFU product	-	181	-
Total MIR calculated gms Ozone per 1L of RFU paint	3,102	784	363
RFU product (KL)	2,000		
Equivalent amount of low VOC RFU product (KL)		1,000	1,250
Tonnes VOC Solvent Emitted.	1,620	158	158
Tonnes Exempt Solvent Emitted.		669	
Total tonnes of Organic Solvent Emitted	**1,620**	**826**	**158**
Tonnes of MIR Calculated Ozone for Each Technology	**6,205**	**784**	**454**

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Attachment 2 – **Enviromental effect comparison at clearcoat level**

2K Clearcoat			
Technology	**Standard Solventborne 2K Clearcoat**	**CARB Solventborne 2K Clearcoat**	**PPD High Solids Solventborne 2K Clearcoat**
RFU Clearcoat 1 litre (mls)	1,000	1,000	1,000
Contains Water?	No	No	No
Contains Exempt solvents?	No	Yes	No
VOC g/L (excluding water and exempt solvents)	576	250	420
Density of VOC in RFU paint	0.90	0.90	0.90
Density of Exempt solvent in RFU paint	-	1.07	0.90
Volume solids at RFU (% vol/vol)	36.00	36.00	52.00
Volume of solids at RFU (MLS)	360	360	520
Volume of VOC at RFU (MLS)	640	138	455
Volume of Exempt at RFU (MLS)	-	502	-
Volume of water (MLS)	-	-	-
Volume total solvent (VOC plus exempt) at RFU (mls)	640	640	455
Grams of Solids at RFU	414	414	598
Grams VOC solvent at RFU	576	125	410
Grams of Exempt Solvent at RFU	-	537	-
Grams of Water at RFU	-	-	-
Typical VOC Solvents	N-butyl acetate: xylene 1:1	N-butyl acetate: xylene 1:2	N-butyl acetate: xylene 3:1
Typical Exempt Solvents		acetone/parachloro benzotrifluoride 1:1	
MIR for VOC solvents excluding exempts	3.83	4.81	2.36
MIR for Exempt Solvents		0.27	
MIR Calctd GMS Ozone for VOCs Per Litre of RFU Product (Excluding Exempts)	2,206	599	966
MIR Calctd GMS Ozone for Exempts Solvents Only Per Litre of RFU Product	-	145	-
Total MIR calculated gms Ozone per 1L of RFU product	2,206	744	966
RFU product (KL)	1,000		
Equivalent amount of low VOC RFU product (KL)		1,000	692
Tonnes VOC Solvent Emitted.	576	125	284
Tonnes Exempt Solvent Emitted.		537	
Total tonnes of Organic Solvent Emitted	**576**	**661**	**284**
Tonnes of MIR Calculated Ozone for Each Technology	**2,206**	**744**	**669**

Assumption:

- VOCs have an average density of 0.9
- Exempts are made up of 50:50 acetone: Oxsol with an average density of 1.07
- MIRs: NBA 0.88, xylene 6.78, acetone 0.43, Oxsol 0.11, butoxy ethanol 2.88