Jiangsu Runtai Chemical Co., Ltd. is a professional manufacturer producing environmentally friendly coatings additives. Located in Jiangsu Province, P. R. China, the plant has annual capacity of 100,000 MT.

Runtai Chemical's main products include 2,3,4-trimethyl-1,3-pentanediol monosuberate (C-12 Coalescent Agent), high boiling point solvent DBE and plasticizer Dimethyl Phthalate (DMP).

Runtai warmly welcome global partners cooperation to create a win-win business!
As the Spring Festival is coming, China Coatings witnessed the prosperity of Chinese coatings industry during this Chinese calendar year. Under the guideline of environment protection, energy saving, emission reduction, and innovation driven, our journal demonstrates the exertion of the coatings industry in the practice of “Beautiful China, We are in Action”.

A series of stricter environmental policies and regulations have been issued with the upgraded control on atmospheric pollution. MEP is formulating a systemic improvement plan on the regulation of VOC in the coatings industry, among which, the regulation on VOC emission reduction of the coating in automobile manufacturing and maintenance became one of the key concerns. Therefore, the industry of automobile coatings manufacturing and painting will face fiercer challenges, as the VOC emission reduction, energy-saving and consumption-reducing in automobile painting come into focus. In this and the following issues, to prompt the further improvement and promotion of environmentally friendly painting in the automobile industry, the editors collect the successful cases on sustainable painting, explore the proper way to realize VOC emission reduction and consumption-saving standards, providing the reference for other fields in coatings and painting industry. The successful cases have been demonstrated on a wide range of topics, including the trend of VOC emission reduction control, the relevant domestic and foreign regulations on automobile coatings and painting and the environmental life cycle assessment of car coating, the application of the sophisticated technologies in VOC emission reduction, and the developing trend of Chinese automobile painting industry.

Additionally, this issue offers parts of core polices on VOC, some published standards of China coatings industry, and main activities of CNCIA. The consumption tax interpretation is widely concerned by the whole industry as well.

The year of 2015 comes with the centennial celebration of China coatings industry. At the historical moment, China Coatings would project the national policies from a more precise perspective, convey the immediate information and accurately detect the pulse of the development in coatings industry. China coatings industry will keep up with the pace of global development, and the world is impressed by a brand new look of China coatings industry with quality, efficiency and prosperity in the “new normal”!

Jian Wang
Executive Chief Editor of China Coatings
## CONTENTS

<table>
<thead>
<tr>
<th>Contents</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Policies Relevant to Coatings and Pigments Industries in 2014</td>
<td>P01</td>
</tr>
<tr>
<td>Accurate Interpretation of the Collection of VOC Consumption Tax on Coatings</td>
<td>P19</td>
</tr>
<tr>
<td>Interpretation on Detailed Regulation for Implementation of License for Production of Hazardous Chemicals (Coatings Products)</td>
<td>P26</td>
</tr>
<tr>
<td>Analysis on VOC Emission Reduction in China Coatings and Painting Industry</td>
<td>P33</td>
</tr>
</tbody>
</table>

### Regulations and Standards

- 01 Policies Relevant to Coatings and Pigments Industries in 2014
- 09 Standards Issued Relevant to the Coatings and Pigments Industries
- 14 National Standards (Coatings and Pigments) Issued in 2013

### Review Members

Chengyou Kan, Jie Deng,
Xinhuai Huang, Taijiang Gui,
Fucheng Yan, Hongdong Duan,
Gang Duan, Weixing Wang,
Yue Shen, Mingjun Yang,
Mimi Zhou, Jianlong Zhou,
Qinghui Hao, Yuanyuan Long
16 Industry Standards (Coatings and Pigments) Issued in 2013

**Hot Topics**

19 Accurate Interpretation of the Collection of VOC Consumption Tax on Coatings
   — Accurate Interpretation of “CS [2015] 16”

26 Interpretation on Detailed Regulation for Implementation of License for Production of Hazardous Chemicals (Coatings Products)

**Energy-saving and Emission-reduction**

33 Analysis on VOC Emission Reduction in China Coatings and Painting Industry

39 Development of Relevant Regulations on Automobile Coating Business at Home and Abroad

**CNCIA Update**

44 CNCIA Main Activities (October-December, 2014)

45 News in Brief of CNCIA
   - Art Coatings and Painting Branch of CNCIA was Founded in Beijing
   - The 2nd Session of Peking University Coatings Enterprises Senior Talents Seminar was Held in Beijing

47 Introduction to China Coatings Show 2015

32 Digital World
CHINA COATINGS®
China Coatings (Chinese Version) · China Coatings Newspaper
China Paint and Coatings Industry Annual
China Coatings Business Guide
China Coatings (English Version)
Consumption Tax Collection Policy for Solventborne Coatings

The Ministry of Environmental Protection (MEP), the Ministry of Finance (MOF) and the State Administration of Taxation (SAT) planned to control and reduce VOC in coatings and painting industries through the consumption tax. After communications with MEP, MOF and SAT and the compilation of relevant materials to reflect the industrial appeals, China National Coatings Industry Association (CNCIA) finally influenced the formulation of the consumption tax policy for coatings: the consumption tax will not be levied on all solventborne coatings, i.e., the high solid coatings will be exempted. According to the latest request for comment from MOF, the coatings manufacturers as tax payers should pay the consumption tax at a tax rate of 4% (based on ex-factory price) for all coatings with VOC content at and above 420 g/L. Besides, SAT is working on formulating a specific tax collection plan, including the tax collection methods for OEM, coatings subpackaging, etc..

Formulation of the Pilot Scheme for VOC Emission Charge

MEP and MOF jointly implemented the VOC emission charging pilot project, including petrochemical refining, package & printing and industrial painting. The industrial painting refers to the painting process carried out by industrial manufacturers or operators during the industrial production or maintenance. CNCIA suggested setting up a threshold in such key fields as automobile, container, furniture, ship, coil, etc., to encourage the use of environmentally friendly coatings. Moreover, the VOC definition, as an important basis, has been widely concerned. The temporary definition in the scheme says: all organic
compounds (excluding methane) that has an initial boiling point less than or equal to 260 °C under the standard atmospheric pressure of 101 325 Pa, and is emitted into air in the form of gaseous molecules. It is known that MEP is making an unified VOC definition and the new definition will be adopted in this plan.

The emission charge will be used to set up an environmental fund to encourage environmental management, including the environmental protection pilots in waterborne wood coatings. It has been determined that those “painting enterprises” (wood furniture manufacturers) buying waterborne wood coatings from the environmental protection pilots will be subsidized, in an amount planned to be a certain proportion of the sales price. Originating from the “VOC emission fee” collected by the state, the subsidy will be managed by MOF, governed by MEP and distributed by the local authorities, and CNCIA will also be involved as a project participant in the future.

Study of Features and Prevention & Control Measures of VOC Emitted from Industrial Painting Sources

As studies have shown that VOC emission is closely related to PM$_{2.5}$, VOC control has been one of the key aspects in the prevention and control of air pollution. Industrial source is the most predominant VOC emission source, contributing up to 55.5% of emissions (see Fig. 1). Moreover, coatings and painting industries are key industrial sources and their VOC emission accounts for 21.6% of the whole industrial source and 12% (55.5% × 21.6% = 12%) of the whole VOC source. Therefore, national VOC prevention and control measures focus on the coatings and painting industries.

As shown in Fig. 1, the “technological process with VOC as raw material”, including the coatings production process, contributes only a small percentage of VOC emission. Thus, the Ministry of Environmental Protection has been aware that the VOC of coatings is mainly emitted during painting. The
environmental public welfare program, named as the Executive Plan for Study of Features and Prevention & Control Measures of VOC Emitted from Industrial Painting Pollution Sources, focuses on the main links and aims to force the coatings manufacturers to produce and use low VOC-containing environmentally-friendly coatings, as pushed by painting users in the process of the industrial chain guiding. This program is jointly undertaken by Chinese Academy for Environmental Planning of the Ministry of Environmental Protection, China National Coatings Industry Association, Beijing Municipal Research Institute of Environmental Protection, China-Japan Friendship Environmental Protection Center and the Research Center for Eco-Environmental Sciences of Chinese Academy of Sciences. China National Coatings Industry Association is responsible for the survey on the current state of emission and control and the study on standard for VOC limit values in coating products and takes part in the selection of feasible control technologies and the development of the control plan.

The Project Contains 5 Tasks:

Task 1: Study the VOC emission factors and major component spectrum of Chinese key industrial painting industries

Task 2: Develop a list of VOC emissions in Chinese industrial painting industries.

Task 3: Study the control standards and codes for VOC emission in Chinese industrial painting industries.

Task 4: Select the feasible VOC prevention and control technologies in Chinese industrial painting industries.

Task 5: Study the VOC control road map in Chinese industrial painting industries.

Achievements, Following Documents have been Compiling:

Manual for VOC Emission Factors in Key Industrial Painting Industries (suggestion draft)
VOC Emission Calculation Method in Industrial Painting Industries (suggestion draft)
VOC Emission Standard for Key Industrial Painting Industries (suggestion draft)

Guideline for Feasible VOC Prevention and Control Technologies in Key Industrial Painting Industries (suggestion draft)

Technical Guideline for VOC Emission Control Measures in Industrial Painting Industries (suggestion draft)

Industrial Painting Segments Involved:

Automobile manufacturing, shipbuilding, container manufacturing, furniture manufacturing, engineering machinery, coiled material and steel structure.

National Environmental Welfare Project: Study on VOC Limit for Architectural Coatings and Relevant Control Measures

CNCIA, along with institutions including Beijing Municipal Research Institute of Environmental Protection and Chinese Academy for Environmental Planning, etc., successfully applied for the 2014 National Environmental Welfare Project: Study on VOC Limit for Architectural Coatings and Relevant Control Measures, which involves fields such as interior and exterior walls coatings, floor coatings, waterproof coatings, and fireproof coatings, etc.. Relevant information of the project is as follows:

Objective: Understand the types and application of architectural coatings available in China, set up the VOC detection and analysis methods for relevant products, determine the VOC limit values for various architectural coatings, compile the VOC standards and pollution prevention technique guidelines for architectural coatings, optimize and formulate the environmental labeling standards for the architectural coatings, put forward the management and control systems for architectural coatings, guide the improvement of industrial VOC control concepts and technologies from the perspective of application, and provide references for management and control of other products containing VOC.

Main research contents cover: (1) Conduct industrial and market investigations on the types and applications of current architectural coatings, to understand the pollution features of different architectural coatings; (2) Develop the VOC detection and analysis methods, and organize the VOC detection and analysis for major domestic architectural coatings; (3) Screen the VOC prevention techniques suitable to our country,
and compile the pollution prevention technique guidelines for VOC in architectural coatings; (4) Determine the VOC limit values for architectural coatings based on assessment of the domestic manufacturing process and current technical status of the architectural coatings, compile the VOC standard for architectural coatings, and formulate and revise the environmental labeling standard for architectural coatings; (5) Investigate foreign laws, policies, regulations and standards for VOC-containing products and put forward the management and control systems for the VOC of various architectural coatings.

**Comprehensive Regulation Scheme for VOC in Surface Painting**

Corresponding to the National Public Welfare Project: *Study on VOC Emission Features and Control Countermeasures for Industrial Painting Pollution Sources*, MEP is formulating the comprehensive regulation scheme for VOC emission in the painting and other fields. The scheme aims at solving such prominent problems as backward VOC control technology and equipment for surface painting, low operational efficiency of pollution control facilities, laggard environmental management and monitoring capabilities, serious VOC pollution in some regions, etc.. The VOC pollution regulation has been principally completed in such key industries as automotive manufacture and maintenance, furniture manufacture, etc.; a batch of VOC regulation projects fully completed; the VOC emission situation of surface painting learned clearly; and the control system for VOC emission during surface painting established and improved. As a result, the total VOC emission will decrease, and the regional environmental quality will significantly improve. All local environmental protection sectors should, based on the work target of the scheme, formulate the surface painting VOC emission reduction scheme for all enterprises involving the surface painting in their jurisdictions, especially automotive manufacture and maintenance, furniture manufacture, etc.. Moreover, it is required to give prominence to the key points to realize the task of regulating the surface painting VOC pollution in phases and to establish and improve the surface painting VOC monitoring system, in order to ensure high-efficiency VOC purification and effectively reduce emission.

As a result, all local environmental protection sectors are assigned with larger responsibilities and powers to handle the surface painting VOC in their jurisdictions, which imposes higher environmental protection pressures on the painting enterprises. The policy-making ministries and commissions have noted that the
environmental requirements for coatings manufacturers cannot be easily transmitted to the downstream painting industries, since the coating manufacturers in the industrial chain are in a weak position compared with the painting enterprises. It has become a consensus among all policy-making ministries and commissions to transmit the environmental protection pressures to the coatings manufacturers with the policy measures of strictly managing the painting industry, to accelerate the development of the environmentally friendly coatings.

Request for Comment on the Law of the People’s Republic of China on the Prevention and Control of Atmospheric Pollution

In September 2014, the Legislative Affairs Office of the State Council, printed and distributed the Law of the People’s Republic of China on the Prevention and Control of Atmospheric Pollution (request for comment) to solicit public opinions, which mainly includes:

The competent standardization authority in the State Council, along with the competent environmental protection authority, etc. drawn up the quality standards for VOC-containing products including coatings, to ascertain the environmental protection requirements. Those products which cannot meet the environmental protection requirements are prohibited from being manufactured, sold or imported.

The production and service activities generating waste gas containing VOC shall be conducted in enclosed spaces or equipment, and the pollution prevention facilities shall be installed and used as specified; relevant measures shall be adopted to reduce waste gas emission in case such confinement cannot be achieved.

The industrial painting enterprise shall establish a list recording VOC content in the raw materials, auxiliaries, waste and their emission directions.

The coatings with low VOC content shall be used for the industrial painting. The state encourages buying and using the coatings with low VOC content, through tax preference and other measures.

The competent environmental protection authority, along with the comprehensive economy authority and the industry and informatization authority, in the State Council, released the List for Products with High Pollution and Environmental Risk.

The competent trade authority in the State Council and the General Administration of Customs formulated the Catalogue of Prohibited or Constrained Commodities in Processing Trade; the competent finance and tax authorities in the State Council shall consider the influences of commodities included in the List for Products with High Pollution and Environmental Risk on the atmospheric environment during
their production, processing or usage, when formulating the policies of consumption tax, resource tax and export tax rebate.

**List for Products with High Pollution and Environmental Risk (2014)**

For years, CNCIA has been cooperating with MEP in revising the *Environmental Protection Comprehensive List*. The influence of the *List for Products with High Pollution and Environmental Risk* has been further promoted, as it is an important part of the *Environmental Protection Comprehensive List*. For instance, it has been included in the *Law of the People’s Republic of China on the Prevention and Control of Atmospheric Pollution*, and all ministries and commissions have been regarding it as an important basis regarding environmental protection, when implementing relevant policies. In the 2014 version, three coatings with high pollution and environmental risk were added: high VOC and low solid UV curing coatings, asphaltic ship bottom antifouling coatings and unsaturated polyester coatings containing styrene.

**Request for Comment on the Catalogue for the Guidance of Foreign Investment Industries of the National Development and Reform Commission**

On November 4, 2014, the National Development and Reform Commission issued the request for public comment on the *Catalogue for the Guidance of Foreign Investment Industries*. As proposed by CNCIA, “the production of high performance coatings, high solid coatings, solvent-free coatings, waterborne industrial coatings and related waterborne resin” has been added into the encouraged category.

**Compilation of Relevant Standards Regarding Inorganic Pigments**

CNCIA drafted the standards on the energy consumption per unit product for titanium dioxide and iron oxide pigments, which will respectively specify energy consumption standards for the current, newly-incorporated
and advanced enterprises of titanium dioxide and iron oxide pigments. The preliminary drafts for the two standards have been formed and are to be issued in 2015 after approval.

According to the new standard formulation rules, MEP decided to establish the pollutants emission standards for inorganic pigment production after combining and supplementing the emission standards (under formulation) during the production of titanium dioxide, iron oxide pigments, chromium pigment, lithopone, etc.. The compilation of standards was organized by China Petroleum and Chemical Industry Federation, and was jointly drafted by CNCIA and Qingdao University of Science and Technology. The preliminary draft has been completed and planned to be submitted to MEP in 2015.

The National Development and Reform Commission, the Ministry of Industry and Information Technology and MEP jointly issued an announcement (No. 16 in 2014) including the formulation (revision) plan for the first batch of cleaner production assessment indicator system, and determined to combine the national clean production standards. Therefore, the clean production standards and review guides for titanium dioxide and iron oxide of MEP will be combined with those of the Ministry of Industry and Information Technology into the Assessment Indicator System for Cleaner Inorganic Pigments Production. This system was organized by China Petroleum and Chemical Industry Federation and was compiled by CNCIA.

**Standard for Limit Value of Harmful Substances in Coatings, Drafted in Beijing, Shenzhen and Shanghai**

Local painting emission standards or VOC content standards of coatings are being developed throughout China, covering key fields including building, automobile and carpentry. As an example, Fig. 2 compares the limit of VOC emissions from automobile painting between major domestic cities and EU. It can be seen that main local standards in China are stricter than EU standards, indicating the severe situation in China.

**Fig. 2 Standards for Limit Value of Harmful Substances in Automobile Painting**
Standards Issued in 2014 Relevant to the Coatings and Pigments Industries

VOC Emission Standard for Coatings and Painting in Beijing

In February 2014, the Work Measures (2014) for Clean Air Action Plan 2013-2017 in Beijing were officially issued. It further detailed the 84 key tasks in the Five-year Plan and required that the annual average concentration of PM$_{2.5}$ would decrease by about 5% in the whole city this year, down to 85 μg/m$^3$. It stated that the emission standard for air pollutants in seven major VOC-emitting industries would be established in Beijing in 2014, such as the boiler, packaging & printing, furniture manufacture, automobile manufacture and repair, chemical engineering, industrial painting, etc., and the VOC limit standard in architectural coatings would also be investigated and established.

Technical Requirements for Environmental Labeling Products—Water-based Coatings

In March 2014, the Technical Requirements for Environmental Labeling Product—Water-based Coatings (HJ 2537-2014), which was issued by the Science and Technology Standard Department of the Ministry of Environmental Protection (MEP), and drafted by the Environment Development Center of MEP, was officially implemented on July 1, 2014, and the original standards of HJ/T 201-2005 was abolished at the same time. The new version adjusted the application scope, and the requirements for substances which must not be artificially added and the limit requirements for glycol ether and its ester-derivatives, and tightened the limit requirements for VOC and total limit quantity of benzene, methylbenzene, dimethylbenzene and ethylbenzene.

Architectural Reflective Thermal Insulation Coatings

The Standard was organized by the Institute of Standards, Ministry of Housing and Urban-Rural Development, and published by the Standards Press of China. Proposed by the Research Institute of Standards and Norms of the Ministry
of Housing and Urban-rural Development, the Standard has revised the classification of the products; classified architectural reflective thermal insulation coatings according to the brightness; deleted relevant tags; added the near-infrared reflectance and sunlight reflectance variance ratios after pollution and artificial aging; deleted thermal-insulation temperature difference and its declining; added the method for determination of sunlight reflectance; revised the method for determination of hemispherical emittance; deleted Appendix A: “Boundary Conditions for Heat Engineering Calculation of Architectural Reflective Thermal Insulation Coatings”. The updated standard will significantly promote the development of the domestic architectural coatings market.

Regulations on Harmful Substances in Coatings and Adhesives in Shenzhen

In May 2014, the Limits on Harmful Substances in Architectural Decorating and Refurbishing Coatings and Adhesives (comment draft) was drafted by Shenzhen Academy of Metrology & Quality Inspection. After the procedure of soliciting comments from the public was completed on May 23, 2014, the code was published on December 15 and will be put into effect on March 1, 2015. The requirements for the architectural decorating and refurbishing coatings and adhesives sold and used in Shenzhen are specified in this regulation including the terms and definitions, technical requirements, inspection methods, evaluation rules and packing identification. The regulation covers coating products including exterior wall coatings, wood coatings, anticorrosive coatings, waterproof coatings, floor coatings, putties and various adhesives. The detailed and strict limit requirements for harmful substances and VOC are specified in the specification.

<table>
<thead>
<tr>
<th>Item</th>
<th>Technical indicators</th>
<th>Wall primer</th>
<th>Wood, anticorrosive, waterproof and floor coatings</th>
<th>Putty</th>
<th>Wood (limited to polyurethane wood putty)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total VOC (g/L)</td>
<td>≤ 500</td>
<td>≤ 100</td>
<td>&lt; 250</td>
<td>&lt; 10</td>
<td>≤ 0.4</td>
</tr>
<tr>
<td>Benzene, toluene, dimethylbenzene and ethylbenzene (mg/kg)</td>
<td>≤ 80</td>
<td>&lt; 150</td>
<td>&lt; 500</td>
<td>≤ 0.4</td>
<td>≤ 0.4 (limited to polyurethane wood putty)</td>
</tr>
<tr>
<td>Free formaldehyde (mg/kg)</td>
<td>≤ 80</td>
<td>&lt; 150</td>
<td>&lt; 500</td>
<td>≤ 0.4</td>
<td>≤ 0.4</td>
</tr>
<tr>
<td>HCHO (according to methylene chloride) (mg/kg)</td>
<td>≤ 100</td>
<td>&lt; 250</td>
<td>&lt; 500</td>
<td>≤ 0.4</td>
<td>≤ 0.4</td>
</tr>
<tr>
<td>Total free formaldehyde (TDI, HDI) (%)</td>
<td>&lt; 0.4</td>
<td>&lt; 0.4</td>
<td>&lt; 0.4</td>
<td>&lt; 0.4</td>
<td>&lt; 0.4</td>
</tr>
<tr>
<td>Glycol ethers and other esters (ethylene glycol monomethyl ether, ethylene glycol monomethyl ether acetate, diethylene glycol monobutyl ether acetate, (mg/kg)</td>
<td>&lt; 100</td>
<td>&lt; 250</td>
<td>&lt; 500</td>
<td>≤ 0.4</td>
<td>≤ 0.4</td>
</tr>
<tr>
<td>Lead</td>
<td>≥ 75</td>
<td>≥ 60</td>
<td>≤ 90</td>
<td>&lt; 90</td>
<td>&lt; 90</td>
</tr>
<tr>
<td>Cadmium</td>
<td>≥ 60</td>
<td>≥ 60</td>
<td>≤ 90</td>
<td>&lt; 90</td>
<td>&lt; 90</td>
</tr>
<tr>
<td>Chromium</td>
<td>≥ 60</td>
<td>≥ 60</td>
<td>≤ 90</td>
<td>&lt; 90</td>
<td>&lt; 90</td>
</tr>
<tr>
<td>Hydrogen</td>
<td>≥ 60</td>
<td>≥ 60</td>
<td>≤ 90</td>
<td>&lt; 90</td>
<td>&lt; 90</td>
</tr>
</tbody>
</table>
Table 2  Requirements for Harmful Substances Limits in Architectural Decorative Coatings (before Jul. 1, 2015)

<table>
<thead>
<tr>
<th>Item</th>
<th>Technical Indicators</th>
<th>Interior surfacer</th>
<th>Exterior surfacer</th>
<th>Wall primer</th>
<th>Wood, anticorrosive, waterproof and floor coatings</th>
<th>Putty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total VOC (g/L)</td>
<td></td>
<td>Luster (60°) ≤ 10</td>
<td>Luster (60°) &gt; 10</td>
<td>≤ 100</td>
<td>Interior primer</td>
<td>Exterior primer</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Benzene, toluene, dimethylbenzene and ethylbenzene (mg/kg)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Free formaldehyde (mg/kg)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Halohydrocarbon (according to methylene chloride)/(mg/kg)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total free disocyanate (TDI, HDI)/%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glycol ethers and ether esters (ethylene glycol monomethyl ether, ethylene glycol monomethyl ether acetate, ethylene glycol monoethyl ether acetate, diethylene glycol monobutyl ether acetate)/(mg/kg)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Soluble heavy metal (mg/kg)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lead</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cadmium</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chromium</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hydrargyrum</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

The VOC Comprehensive Emission Standard in Tianjin was Released

On August 1, 2014, the VOC Emission Control Standard for Industrial Enterprises (DB 12/524-2014) was officially issued and implemented in Tianjin. This is the first comprehensive standard regarding VOC emission of the industrial enterprises in Tianjin. As the first comprehensive standard in China, this standard is significant for the VOC control and total emission reduction in the industrial enterprises. The implementation of this standard in Tianjin is a significant step in the control of VOC emissions and the improvement of ambient air quality. The standard specifies the requirements for VOC emission concentration and speed limit, unorganized leakage and fugitive pollution control, concentration limit of factory monitory points and administrative regulations and monitoring points. The standard also specifies the requirements for standardized technology organizations to complete the formulation and revision of the standards for industries including chemical engineering, metal smelting, ferrous metal smelting, printing and packaging, and furniture manufacturing. The standards are relevant to coatings industry and the materials used in these industries, including polyurethane, polyurethane wood putty, polyurethane waterproof coatings, primer, and putty for polyurethane waterproofing. The standards aim to reduce VOC emissions and improve the quality of indoor air in Tianjin.
4 Requirements for Pollutant Emission Control

4.1 Limits for organized VOC emission

4.1.1 From the executive date of the Standard to December 31, 2015, all existing enterprises shall follow the pollutant emission limits specified in Table 1. From January 1, 2016, they shall observe the pollutant emission limits specified in Table 2.

4.1.2 From the executive date of the Standard, new enterprises shall observe the pollutant emission limits specified in Table 2.

<table>
<thead>
<tr>
<th>Industry</th>
<th>Process facilities</th>
<th>Pollutants</th>
<th>Emission concentration (max)/(mg/m³)</th>
<th>Emission speed(max)/(kg/h)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>15 m</td>
<td>20 m</td>
</tr>
<tr>
<td>Manufacture of coatings and printing ink</td>
<td>Production of resins/emulsions, blending, distribution and grinding of raw materials, and other processes</td>
<td>Benzene</td>
<td>5</td>
<td>0.25</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total of methylbenzene and dimethylbenzene</td>
<td>40</td>
<td>1.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>VOC</td>
<td>100</td>
<td>2.5</td>
</tr>
<tr>
<td>Surface painting</td>
<td>Mixing and spraying processes</td>
<td>Benzene</td>
<td>1</td>
<td>0.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total of methylbenzene and dimethylbenzene</td>
<td>40</td>
<td>1.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>VOC</td>
<td>90</td>
<td>2.5</td>
</tr>
<tr>
<td></td>
<td>Baking process</td>
<td>Benzene</td>
<td>1</td>
<td>0.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total of methylbenzene and dimethylbenzene</td>
<td>40</td>
<td>1.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>VOC</td>
<td>80</td>
<td>2.5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Industry</th>
<th>Process facilities</th>
<th>Pollutants</th>
<th>Emission concentration (max)/(mg/m³)</th>
<th>Emission speed(max)/(kg/h)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>15 m</td>
<td>20 m</td>
</tr>
<tr>
<td>Manufacturing of coatings and printing ink</td>
<td>Production of resins/emulsions, blending, distribution and grinding of raw materials, and other processes</td>
<td>Benzene</td>
<td>5</td>
<td>0.25</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total of methylbenzene and dimethylbenzene</td>
<td>30</td>
<td>1.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>VOC</td>
<td>80</td>
<td>2.0</td>
</tr>
<tr>
<td>Surface painting</td>
<td>Mixing and spraying processes</td>
<td>Benzene</td>
<td>1</td>
<td>0.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total of methylbenzene and dimethylbenzene</td>
<td>20</td>
<td>0.6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>VOC</td>
<td>60</td>
<td>1.5</td>
</tr>
<tr>
<td></td>
<td>Baking process</td>
<td>Benzene</td>
<td>1</td>
<td>0.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total of methylbenzene and dimethylbenzene</td>
<td>20</td>
<td>0.6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>VOC</td>
<td>50</td>
<td>1.5</td>
</tr>
</tbody>
</table>
China National Coatings Industry Association (CNCIA) Issued the Standard - Plastic Coatings for Motorcycles

The standard - Plastic Coatings for Motorcycles, drafted by CNCIA, was issued on October 23, 2014, and implemented on January 1, 2015. The standard provides the basis for regulating the application of plastic coatings for motorcycles, improving technical performance of relevant products, promoting the healthy development of plastic coatings for motorcycles and improving the product quality.

Beijing Printed and Distributed the Notification on the Catalogue of Adjusted and Eliminated Production Processes and Eliminated Equipment in Industrial Pollution Industries in Beijing (2014 Edition)

On October 23, 2014, the General Office of the People’s Government of Beijing Municipality printed and distributed the notification on the Catalogue of Adjusted and Eliminated Production Processes and Eliminated Equipment in Industrial Pollution Industries in Beijing (2014 Edition), which was formulated by Beijing Municipal Commission of Economy and Information Technology and Beijing Municipal Environmental Protection Bureau. The Catalogue involves 105 high pollution and energy consumption industries and manufacturing technologies, as well as 50 kinds of backward equipment commanded to be obsoleted. For the coatings industry, the modified starch coatings, organotin-contained antifouling coatings, tributyltin and lead tetraoxide contained coatings, dichlorodiphenyl trichloroethane contained coatings, triglycidyl isocyanurate (TGIC) contained powder coatings, toy coatings which cannot meet the Limit of Harmful Substances in Coatings for Toys, automotive coatings which cannot meet the Limit of Harmful Substances in Automotive Coatings, interior wall coatings which cannot meet the Limit of Harmful Substances in Interior Wall Coatings of Indoor Decorating and Refurbishing Materials (GB 18582) and paint strippers containing benzene, phenol, benzaldehyde, dichloromethane and trichloromethane must be withdrawn immediately; the production of titanium dioxide must be shut down by the end of 2015, and the organic solvent-based coatings, which currently have the largest market scale, must be withdrawn by the end of 2016. The Catalogue has significant effects on Beijing coatings industry, the coatings manufacturing enterprises must be shut down, withdrawn or transformed from pollution enterprises to high-end manufacturing, service providing and high-tech industry after changing their business licenses and dismantling their pollution production equipment.
# National Standards (Coatings and Pigments) Issued in 2013

<table>
<thead>
<tr>
<th>S/N</th>
<th>No.</th>
<th>Description</th>
<th>Replaced standard</th>
<th>Scope</th>
<th>Date of issue</th>
<th>Date of implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>GB/T 29499-2013</td>
<td>Synthetic Resin Curtain-wall-imitation Coating on Buildings</td>
<td>GB/T 4893.4-1985</td>
<td>The Standard specifies the terms and definitions, product classification, basic structure, materials, requirements, testing methods, inspection rules, marks, package and storage of the synthetic resin coating for imitating curtain walls of buildings, and is applicable for the requirements and tests of the architectural coating, which are composed of putty, primer and coatings and have the visual appearance of curtain walls.</td>
<td>2013-05-07</td>
<td>2013-12-01</td>
</tr>
<tr>
<td>2</td>
<td>GB/T 19250-2013</td>
<td>Polyurethane Waterproof Coatings</td>
<td>GB/T 19250-2003</td>
<td>The Standard specifies the classification, general requirements, technical requirements, testing methods, inspection rules, marks, package, transportation and storage of polyurethane (PU) waterproof coatings and is applicable to the PU waterproof coatings for waterproofing projects.</td>
<td>2013-09-27</td>
<td>2014-08-01</td>
</tr>
<tr>
<td>3</td>
<td>GB/T 4893.4-2013</td>
<td>Test of Surface Coatings of Furniture—Part 4: Determination of Adhesion—Cross Cut</td>
<td>GB/T 4893.4-1985</td>
<td>This part of GB/T 4893 is applicable to determine the adhesion of surface films of wood furniture components. The testing method is not applicable to the paint films with thickness of 250 μm or above or uneven films.</td>
<td>2013-10-10</td>
<td>2014-05-01</td>
</tr>
<tr>
<td>4</td>
<td>GB/T 4893.5-2013</td>
<td>Test of Surface Coatings of Furniture—Part 5: Determination of Thickness</td>
<td>GB/T 4893.5-1985</td>
<td>This part of GB/T 4893 specifies the methods for testing paint film thickness on surfaces of wood furniture components. It is applicable to the measurement of paint films on the surfaces of wood furniture components.</td>
<td>2013-10-10</td>
<td>2014-05-01</td>
</tr>
<tr>
<td>5</td>
<td>GB/T 4893.6-2013</td>
<td>Test of Surface Coatings of Furniture—Part 6: Determination of Gloss Value</td>
<td>GB/T 4893.6-1985</td>
<td>This part specifies the methods for testing paint film gloss on the surfaces of wood furniture components. It is applicable to the determination of paint film gloss on the surfaces of wood furniture components. However, it is not applicable to the determination of the gloss of colored paint films containing metallic pigments.</td>
<td>2013-10-10</td>
<td>2014-05-01</td>
</tr>
<tr>
<td>S/N</td>
<td>No.</td>
<td>Description</td>
<td>Replaced standard</td>
<td>Scope</td>
<td>Date of issue</td>
<td>Date of implementation</td>
</tr>
<tr>
<td>-----</td>
<td>-------------</td>
<td>--------------------------------------------------</td>
<td>-------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------</td>
<td>---------------</td>
<td>------------------------</td>
</tr>
<tr>
<td>6</td>
<td>GB/T 4893.7-2013</td>
<td>Test of Surface Coatings of Furniture—Part 7: Determination of Surface Resistance to Alternation of Heat and Cold</td>
<td>GB/T 4893.7-1985</td>
<td>This part specifies the methods for testing the resistance to alternation of heat and cold of paint films on the surfaces of wood furniture components. It is applicable to the assessment of the resistance to alternation of heat and cold of the paint films on wood furniture components</td>
<td>2013-10-10</td>
<td>2014-05-01</td>
</tr>
<tr>
<td>7</td>
<td>GB/T 4893.8-2013</td>
<td>Test of Surface Coatings of Furniture—Part 8: Determination of Wearability</td>
<td>GB/T 4893.8-1985</td>
<td>This part of GB/T 4893 specifies the method for testing the wear resistance of paint films on the surfaces of wood furniture components. It is applicable to determination of the wear resistance of paint films on the surfaces of wood furniture components</td>
<td>2013-10-10</td>
<td>2014-05-01</td>
</tr>
<tr>
<td>8</td>
<td>GB/T 4893.9-2013</td>
<td>Test of Surface Coatings of Furniture—Part 9: Determination of Resistance to Impact</td>
<td>GB/T 4893.9-1992</td>
<td>This part specifies the method for testing the impact resistance of paint films on the surfaces of wood furniture components and is applicable to assess the impact resistance thereof</td>
<td>2013-10-10</td>
<td>2014-05-01</td>
</tr>
</tbody>
</table>
## Industry Standards (Coatings and Pigments) Issued in 2013

<table>
<thead>
<tr>
<th>S/N</th>
<th>Description</th>
<th>Replaced standard</th>
<th>Main contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Heavy Calcium Carbonate for Paint and Coating Industrial Use</td>
<td>HG/T 3249.2-2008</td>
<td>The Standard specifies the classification, typing, requirements, test methods, inspection indications, marks, package, transportation and storage of the heavy calcium carbonates for coatings industry. It is applicable to the heavy calcium carbonates for common coatings industry, which are made by grinding raw materials of calcite, marble or limestones, and by white to be used as extenders in the coatings industry. The products are used as extenders in the coatings industry.</td>
</tr>
<tr>
<td>2</td>
<td>Test Method for Anti-condensation Coatings</td>
<td>HG/T 4560-2013</td>
<td>The Standard specifies the terms and definitions, principles, sample preparation, test conditions, test devices and test results of the test methods for anti-condensation coatings. It is applicable to the coating with the coating surface treatment. The products are used as extenders in the coatings industry.</td>
</tr>
<tr>
<td>3</td>
<td>Unsaturated Polyester Putty</td>
<td>HG/T 4561-2013</td>
<td>The Standard specifies the production grade, requirements, test methods, inspection indications, marks, package, storage and transportation of the unsaturated polyester putty products. It is applicable to the two-component putty, which is composed of the base, unsaturated polyester resin, pigment, filler, additives and so on and used as filling, covering, and other decorative surface painting of the products and so on.</td>
</tr>
<tr>
<td>4</td>
<td>Irreversible Temperature Indicating Coatings</td>
<td>HG/T 4562-2013</td>
<td>The Standard specifies the classification, requirements, testing methods, inspection rules and marks, package, storage and transportation of the irreversible temperature indicator coatings. It is applicable to the irreversible temperature indicator coatings, prepared with heat resistant resins, pigment and fillers, additives and organic solvents and is mainly used for temperature indication in quick warm-up and cooling environments of aeroplanes, gas turbines, and industrial pipelines and so on.</td>
</tr>
<tr>
<td>5</td>
<td>Nonstick Coatings</td>
<td>HG/T 4563-2013</td>
<td>The Standard specifies the classification, requirements, testing methods, inspection rules and marks, package, storage and transportation of the nonstick coatings with low surface treatment tolerance. It is applicable to the epoxy coatings with low surface treatment tolerance, which can maintain preferable performance when being used on non-ideal surfaces (including old paint films and other surfaces, which cannot be thoroughly treated by dusting, hydraulic spray, abrasive blasting, surface treatment).</td>
</tr>
<tr>
<td>6</td>
<td>Low Surface Treatment Tolerant Epoxy Coatings</td>
<td>HG/T 4564-2013</td>
<td>The Standard specifies the classification, requirements, testing methods, inspection rules and marks, package, storage and transportation of the low surface treatment tolerant epoxy coatings. It is applicable to the epoxy coatings with low surface treatment tolerance, which can maintain preferable performance when being used on non-ideal surfaces (including old paint films and other surfaces, which cannot be thoroughly treated by dusting, hydraulic spray, abrasive blasting, surface treatment).</td>
</tr>
<tr>
<td>S/N</td>
<td>No.</td>
<td>Description</td>
<td>Replaced standard</td>
</tr>
<tr>
<td>-----</td>
<td>--------------</td>
<td>--------------------------------------------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td>7</td>
<td>HG/T 4565-2013</td>
<td>High-temperature Resistant Coatings for Boilers and Auxiliary Equipments</td>
<td>HG/T 4565-2013</td>
</tr>
<tr>
<td>8</td>
<td>HG/T 4566-2013</td>
<td>Epoxy Resin Primer</td>
<td>HG/T 4566-2013</td>
</tr>
<tr>
<td>9</td>
<td>HG/T 4567-2013</td>
<td>Elastomeric Middle Coatings for Architecture</td>
<td>HG/T 4567-2013</td>
</tr>
<tr>
<td>10</td>
<td>HG/T 2456.1-2013</td>
<td>Aluminum Pigment for Paints – Part 1: Aluminum Paste</td>
<td>HG/T 2456-1993</td>
</tr>
<tr>
<td>11</td>
<td>HG/T 4568-2013</td>
<td>Chlorinated Ether Anticorrosive Coatings</td>
<td>HG/T 4568-2013</td>
</tr>
<tr>
<td>S/N</td>
<td>No.</td>
<td>Description</td>
<td>Replaced standard</td>
</tr>
<tr>
<td>-----</td>
<td>-----------</td>
<td>--------------------------------------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>12</td>
<td>HG/T 4569-2013</td>
<td>Petroleum and Petroleum Products Storage and Transportation Equipment Antistatic Coatings</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>HG/T 4570-2013</td>
<td>Waterborne Automotive Coatings</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>HG/T 3347-2013</td>
<td>Vinyl Phosphating Primer (Two-component)</td>
<td>HG/T 3347-1987</td>
</tr>
<tr>
<td>15</td>
<td>CB/T 4340-2013</td>
<td>Glass Flake Coatings Used in Ocean Engineering Construction</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>CB/T 4231-2013</td>
<td>Specification for Painting of Ships</td>
<td>CB/T 231-1998</td>
</tr>
</tbody>
</table>
Accurate Interpretation of the Collection of VOC Consumption Tax on Coatings

—— Accurate Interpretation of “CS [2015] 16”

China National Coatings Industry Association

On January 26, 2015, CS [2015] 16 (see Annex) was officially announced. After that, CNCIA has answered numerous consulting calls from coatings enterprises and testing organizations. As CNCIA has been cooperating with related government organs in developing polices on the VOC consumption tax on coatings and completely understood the content of this notice, CNCIA will provide an accurate interpretation for this notice for the reference.

1 Purpose

It aims to promote energy conservation and environmental protection. The collection of VOC consumption tax on coatings is proposed by the Department of Policies, Laws and Regulations of the Ministry of Environmental Protection (MEP). For years, MEP has been implementing environmental economic policies, including green taxation. As the haze is related to VOC, the coatings contains VOC and the Catalogue for Guidance of Industrial Restructuring issued by the National Development and Reform Commission specifies the “restriction on production of solventborne coatings”, the Department of Policies, Laws and Regulations, MEP, suggests the MOF
Department of Taxation and the SAT to collect the consumption tax on solventborne coatings, with the waterborne coatings exempted from taxation.

2 Legal Effect

The State Council approves that the coatings should be included in the collection scope of the consumption tax.

3 Levying Time

The collection of consumption tax for coatings will start from February 1, 2015. On one hand, in the second half of 2013, the first meeting related to the consumption tax on coatings was jointly held by MEP, MOF and SAT, proposing that the consumption tax for solventborne coatings shall be collected by the end of 2014. However, due to issues around dilution in application, OEM, curing agent, threshold, etc., the collection proposal has been repeatedly discussed and modified and the starting time is postponed to February 1, 2015, which is still determined hastily. On the other hand, before or after February 1, 2015, coatings enterprise can follow the requirements of local taxation department to send their products to qualified third-party inspection institutions, which have been certified by the state (China National Accreditation Service for Conformity Assessment), for the inspection and the issuance of inspection reports. The taxation department determines which products surpass the threshold and shall be imposed with the consumption tax as per the inspection report. If products are sent for inspection after February 1, the consumption tax will be collected from January after the testing result has been confirmed, and the enterprises will make up or be asked to make up the consumption tax. Then, the annual type test report of the enterprise is considered valid.

4 Collection Scope

Coatings are defined as liquid or solid materials, which can be applied on the surfaces of objects to form a protective, decorative or special-purpose solid film. The coatings are composed of major and secondary film-forming materials, etc. According to the major film-forming materials, the coatings can be divided into grease type, natural resin type, phenolic resin type, asphalt type, alkyd resin type, amino resin type, nitro type, PVC resin type, alkene resin type, acrylate resin type, polyester resin type, epoxy resin type, polyurethane resin type, organic element type, rubber type, cellulose type and other film-forming material type coatings.

Individual resin, curing agent and thinner are exempted from taxation, and so are secondary film-forming materials mentioned above. This is because resin and curing agent are involved in many
other industries and the consumption tax of the solvent oil and product oil used in thinners have been collected. Therefore, the consumption tax on VOC only focuses on the coatings products, so that the taxation is not collected repeatedly. However, if enterprises add the resin, curing agent and thinner to the compound components of coatings, the consumption tax should be calculated and collected. Film-forming materials other than above 17 types are exempted from taxation, e. g. inorganic siloxane coatings, extremely high zinc-rich coatings (e. g. Zinga), etc.. Other film-forming materials have not been well defined by the taxation department and are still unclear. In the specific taxation circumstance, it is necessary to consult industrial organizations and experts.

5 Taxation Objects

Collect the consumption tax at the stage of production and OEM or import. The taxation objects are mainly the coatings manufacturing enterprises, including the consigned processing enterprises. The consumption tax is exempted at the stage of coatings circulation and application. In other words, marketing, transporting, painting and manufacturing enterprises of the raw materials for coatings are exempted from consumption tax. Foreign coatings manufacturing enterprises will be imposed on the consumption tax if their products in the same brands are imported to China. It is necessary to clarify the following questions from the government: I) How to distinguish the consigned processing, for which only the processing fee is charged, from the OEM, which makes processing with incoming materials? Whether are both levied without exception? II) In the domestic production stage, whether are the subpackaging (from large barrels to small barrels) enterprises levied? Whether are changing the trademark and unchanging the trademark distinguished during subpackaging? III) As the import duty has been collected at the stage of import, whether is the collection of consumption tax deemed as the repetitive taxation?

If the taxation objects are determined in this way, the coatings industry will be subject to a huge change: the sales value will flow to the circulating stage. Instead of the imported coatings, foreign enterprises will import resin, colorant and Component B.
6 Applicable Tax Rate

The applicable tax rate is 4%. It is interpreted that the taxation department will levy the consumption tax equivalent to 4% of the factory sales amount of the coatings manufacture enterprise. After the suitable scope of collection for VOC in products is determined, the sales amount is subject to the amount on the tax-excluded sales invoice issued by the enterprise. It is unclear how MOF defines the applicable tax rate. It may be determined with reference to the sales amount, average price and average profit rate of the coatings industry in 2013, or for the purpose of adapting to the battery industry or others, or on the basis of the calculated total industrial tax amount. For example, if the annual sale value in the coatings industry is RMB 400 billion, the annual consumption tax amount of the coatings industry is RMB 16 billion; and if the collection percentage is 60%, RMB 10 billion can be collected.

7 VOC

(1) VOC definition. The VOC definition in the coatings industry is adopted: it refers to any organic compound with the initial boiling point lower than or equivalent to 250 °C under the standard pressure (101.3 kPa). This concept is only temporarily used by MEP when MEP has not determined a unified standard. Moreover, the VOC concept varies a lot in other industries, some requiring the critical temperature to be 260 °C, or the photochemical reaction to be involved, or saturated vapor pressure to be used or the carbide to be contained. MEP is planning to develop a unified standard, and ministries and commissions believe that the VOC concept in the coatings industry is outdated. According to the concept involving the critical temperature of 250 °C, it is safe for the public to use alcohol ester, the alcohol and acetone are not included in the exemption scope, the toxicity has no influence on the collection limit, MIR is irrelative to the ozone concentration in the air, alcohol and benzene are equivalent in terms of the consumption tax and the haze is not tightly related to the taxation.

(2) Application status. It is impossible to treat VOC under the application status and in the pails in the same way, for VOC can be easily controlled for packaged coatings but no effective control measure is available for coatings during the application. Although it is possible to establish standards, laws and regulations at the national level, to require coatings manufacture enterprise to indicate the VOC content
on the coatings package and the dilution rate during application, which can be used as one of references for taxation and testing. However, there is still a long way to go before the implementation of these standards, laws and regulations.

(3) Threshold. Coatings with the VOC content lower than 420 g/L (including) is exempted from the consumption tax. At the beginning, the Department of Policies, Laws and Regulations of MEP suggested that all solventborne coatings should be imposed on the consumption tax and all waterborne coatings exempted from the consumption tax. CNCIA proposed that it went against the original intention of “encouragement for the high solid coatings” in the Guidance Catalogue for Industrial Structure Adjustment. Therefore, MEP, MOF and SAT have held the industrial expert symposium, on which some experts enumerated foreign situations. One of enumerations was that the Clean Air Act (1990) and its amendments specified the VOC (diluted) limit was 420 g/L (excluding water). MOF adopted this advice, and reported it to the State Council. Then, the State Council approved this advice. This leads to such issues as the VOC content from the dilution to the application, the collection of consumption tax for waterborne coatings, and the water exclusion when the VOC content in the waterborne coatings is tested. Moreover, subsequent suggestions on the gradient tax rate (420 g/L, 3%, 500 g/L, 5%, 600 g/L, 7%, etc.), gradient VOC and annual progress (2% in 2015, 3% in 2020, 4% in 2025, and the upper limit of no more than 4%) are not adopted.

(4) Test methods for VOC. The sample is tested with the gas chromatographic method. If the organic compound with the boiling point over 250 °C is not detected, the tested volatile matter content is the VOC content in the product; and if the organic compound with the boiling point over 250 °C is detected, the qualitative identification and quantitative analysis is made for the organic compound with the boiling point over 250 °C in the sample, and the VOC content in the product should be the tested volatile matter content minus the content of organic compound with the boiling point over 250 °C in the sample. This testing method is characterized in bigger detection error and poorer reproducibility. It needs to be improved.

(5) VOC and solid content. According to the existing standards, VOC indicator is not available for coatings, but the solid content or corresponding indicator is available. According to the result of testing report, VOC content can be calculated by the solid content and density.
8 Testing Organizations

Coatings testing organizations which have lab licenses approved by provincial quality technology supervision departments can issue valid testing reports to decide if consumption tax is applicable for the relevant products. Testing organizations include but not limited to:

- State Building Material Test Center
- National Center for Quality Supervision and Test of Building Engineering
- Marine Coatings Quality Test and Supervision Center of Chemical Industry
- Heilongjiang Quality Supervision and Testing Institute
- Shanxi Product Quality Supervision and Testing Institute
- Chongqing Measuring and Quality Testing Institute
- Hebei Product Quality Supervision and Testing Institute
- China National Quality Supervision and Testing Center of Hazardous Chemicals
- Jiangsu Supervision and Inspection Institute for Product Quality
- Quality Supervision and Testing Center of Latex Products in Chemical Industry
- Beijing Construction Material Quality Supervision and Inspection Station
- Quality Supervision and Inspection Center of Synthetic Material Ageing
- Nanjing Product Quality Supervision and Testing Institute
- National Building and Decoration Material Quality Supervision and Inspection Center
- Shanghai Institute of Quality Inspection and Technical Research
- Fujian Inspection and Research Institute for Product Quality
- Anhui Institute of Product Quality and Inspection and Technical Research
- Tianjin Institute of Product Quality and Inspection and Technical Research
- National Coatings Quality Supervision and Testing Center
- Zhejiang Province Quality Inspection Institute of Science and Technology
- Guangdong Testing Institute of Product Quality Supervision
- Industry Elastomer-Plastic and Chemical Products Quality Inspection Center (Beijing)
- Shanghai Research Institute of Paint and Coatings
Annex

Notice on Collection of Consumption Tax on Batteries and Coatings
(Coatings Part)

CS [2015] 16

Finance departments (bureaus) of all provinces, autonomous regions, municipalities and cities directly under state planning, the State Administration of Taxation and the Finance Bureau of Xinjiang Production and Construction Corps:

In order to promote energy conservation and environmental protection, it has been approved by the State Council to collect consumption tax on batteries and coatings from February 1, 2015. The related matters are hereby notified as follows:

I. Include the batteries and coatings into the collection scope of consumption tax (see the attachment for remarks of specific tax items), and collect the consumption tax at the stage of production and OEM and import, of which the applicable tax rate is 4% without exception.

II. Mercury-free primary batteries, metallic hydride nickel accumulators (also known as “hydrogen-nickel accumulators” or “nickel-hydrogen accumulators”), lithium primary batteries, lithium ion batteries, solar batteries, fuel batteries and vanadium redox flow batteries are exempted from taxation.

For lead batteries, the consumption tax shall be exempted before December 31, 2015, but collected according to 4% tax rate since January 1, 2016.

The coatings containing less than 420 g/L (inclusive) of volatile organic compounds (VOC) during application shall be exempted from taxation.

III. Besides, other issues related to collection management of consumption tax on batteries and coatings shall be executed according to relevant provisions in the Interim Regulations of the People’s Republic of China on Consumption Tax, the Detailed Rules for the Implementation of the Interim Regulation of the People’s Republic of China on Consumption Taxes, etc..

Attachment 1: Remarks on Collection Scope of Tax Items on Batteries
Attachment 2: Remarks on Collection Scope of Tax Items on Coatings

The Ministry of Finance and the State Administration of Taxation
January 26, 2015

Attachment 2:
Remarks on Collection Scope of Tax Items on Coatings

Coatings refer to a collection of liquid or solid materials, which can be applied on the surfaces of objects to form a protective, decorative or special-purpose solid film.

The coatings are composed of major and secondary film-forming materials, etc.. According to the major film-forming materials, the coatings can be divided into grease type, natural resin type, phenolic resin type, asphalt type, alkyd resin type, amino resin type, nitrocellulose type, perchlorovinyl resin type, vinyl resin type, acrylate resin type, polyester resin type, epoxy resin type, polyurethane resin type, elemento-organic compound type, rubber type, cellulose type and other film-forming material type coatings.
Interpretation on Detailed Regulation for Implementation of License for Production of Hazardous Chemicals (Coatings Products)

Shifang Feng
(National Quality Supervision Testing Center for Paint, Changzhou 213016, Jiangsu, China)

Abstract: This paper interprets partial contents of the newly-issued Detailed Regulation for Implementation of License for Production of Hazardous Chemicals (13) (Coatings Products) and briefly describes the main differences compared with the previous version.

Keywords: Hazardous chemicals, Coatings, License, Detailed regulation, Difference

0 Introduction

The new version of Detailed Regulation for Implementation of License for Production of Hazardous Chemicals was effective from May 1, 2013. This paper briefly interprets partial contents of the Detailed Regulation, as well as the main differences between the new and previous editions.

1 Scope of Application

1.1 Applicable Products

Clause 1.2 of the Detailed Regulation specifies “coatings listed in hazardous chemicals are divided into three product units and 30 product varieties (see Table 1). The Detailed Regulation are applicable to the administration of production license for coatings (flashing point ≤ 60 °C, including production and...
subpackaging) containing flammable solvent."

1.1.1 Product Unit

Coating products are mainly divided into 3 product units, namely the clearcoat, color paint and auxiliary materials. Two factors are mainly considered for product unit classification including:

(1) Product Classification Method 2 in the *Classification and Nomenclature for Coatings Products* (GB/T 2705-2003). According to it, coatings products are divided into architectural coatings, other coatings and auxiliary materials. Therefore, auxiliary materials are classified as one unit.

(2) Coatings composition, production technology and equipment requirement. For example, the major difference between the color paint and the clearcoat is that the color paint contains pigments and clearcoat does not include pigments. The grinding equipments are unnecessary for clearcoat production. As for color paint production grinding process is necessary. Therefore, color paint and clearcoat are separately classified into different units.

1.1.2 Product Variety

The production license was only issued for 28 coatings products, when the administration of production license for coatings containing hazardous chemicals was officially launched in 2008. The differences between the two versions in the aspects of coatings varieties include:

(1) Removed varieties: raw lacquer.

(2) Added varieties: nitrocellulose clearcoat, alkyd clearcoat, acrylic color paint and alkyd color paint; it is clearly specified that nitrocellulose clearcoat, alkyd clearcoat, nitrocellulose color paint and alkyd color paint do not cover 3C-certificated products.

(3) Incorporated varieties: Perchlorvinyl coatings, which are composed of zinc yellow and iron oxide red vinyl perchloride primer and various color vinyl perchloride coatings.

(4) Varieties with expanded scope: Phenolic clearcoat (used to be F01-1 phenolic clearcoat); phenolic color paint (used to be various color nitrocellulose exterior enamel); amino alkyd
color paint (used to be A16-51 various color amino baking hammer paint); nitrocellulose color paint (used to be various color nitrocellulose exterior enamel); vinyl perchloride anticorrosion paint (used to be G52-31 various color vinyl perchloride anticorrosion paint), etc.

(5) Varieties with paint removers related to industrial policy. The paint remover, which contains benzene, phenol, benzaldehyde, dichloromethane and trichloromethane, has been listed in the eliminated items according to relevant national regulations (Clause 3.7.1 of Detailed Regulation). And they are not allowed to apply for license.

1.1.3 Production Mode
All enterprises, which produce and subpackage coatings containing hazardous chemicals listed in Table 1 of the Detailed Regulation, shall apply for the production license. The Note 2 of Table 1 explains two production modes (production and subpackaging), namely, the production refers to the production mode involving proportioning, dispersing and grinding processes, etc.; and subpackaging refers to the production mode that large-packaged products are directly subpackaged into small-packaged products.

1.1.4 Scope of Product
In consideration of the current situation that two modes are followed in the formulation of standards for the existing coating products, namely that one standard is formulated according to the classification of major film forming material of the products and the other standard according to the specific purpose of products, coatings manufacturers and users have the rights to select the product standards, which they will perform, according to the specific application of products. Therefore, if a product manufactured by an enterprise is a general product and meets the requirements of relevant product standards of the license, the enterprise shall apply for the license. If a product is manufactured for a specific purpose, but the product standards in respect to that purpose have not been issued in the industry, the enterprise can apply for the license, as well. If a product is manufactured for a specific purpose and specific customers, the product standards for that specific purpose have been issued in the industry or the enterprise has signed a technical
agreement with specific customers but cannot organize production according to relevant product standards of the license, namely, the product performance cannot meet the requirements of the product standards of the license, this situation means the product standard of the license is inapplicable to that product, the noncompliance with the standard disqualifies the enterprise to apply for license, and the enterprise cannot apply for the license. In this case, it is suggested that the name of enterprise’s product should not be the same with the corresponding product variety name in Table 1 for fear of problems caused by the licensed supervision.

1.2 Applicable Standards

Clause 1.4 of the Detailed Regulation specifies “once the national and industrial standards and national industrial polices of relevant products are revised during the implementation of the Detailed Regulation, enterprises shall implement timely, and the Detailed Regulation will be dynamically revised according to the relevant adjustments”. This clause means that once the product standards are issued and implemented after being revised, enterprises shall execute the new standards, irrespective of whether the Detailed Regulation is revised or not, including the configuration for the instruments and equipment for testing, and the ex-work, regular and type inspections for the products, as well as timely upgrading of executive standards in the product identification, according to new standards. The on-site and product inspections shall be carried out by production licensed enterprises according to new standards.

2 Basic Conditions for Enterprises to Apply for Production License

The basic conditions to be possessed by the enterprises applying for the production license of coatings products are specified in Clause 3 of the Detailed Regulation. More attention shall be paid to Clause 3.1: “The enterprise shall have a business license and the applied products shall be covered in its scope of business” and Clause 3.7.2: “The enterprise producing the products listed in Table 1 shall obtain the license for safe production (the subpackaging enterprise shall obtain the business license for hazardous
Hot Topics

chemicals) issued by safe production supervision and management departments”. If the applied products are not covered in the business scope of the enterprise business license and the permitted scope of the license for safe production, the local technical supervision bureau will not accept the enterprise’s application.

Table 1 Standards to be Executed by the Enterprises Producing Hazardous Chemicals (Coatings Products)

<table>
<thead>
<tr>
<th>S/N</th>
<th>Product variety</th>
<th>Standard number</th>
<th>Standard name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Phenolic varnish</td>
<td>GB/T 25253-2010</td>
<td>Phenolic resin coatings</td>
</tr>
<tr>
<td>2</td>
<td>Alkyd baking insulating varnish</td>
<td>HG/T 3372-2012</td>
<td>Alkyd baking insulating varnish</td>
</tr>
<tr>
<td>3</td>
<td>Amino-alkyd varnish</td>
<td>GB/T 2549-2010</td>
<td>Amino-alkyd resin coatings</td>
</tr>
<tr>
<td>4</td>
<td>Amino baking insulating coatings</td>
<td>HG/T 3371-2012</td>
<td>Amino baking insulating coatings</td>
</tr>
<tr>
<td>5</td>
<td>Acrylic varnish</td>
<td>GB/T 25264-2010</td>
<td>Solventborne acrylic resin coatings</td>
</tr>
<tr>
<td>6</td>
<td>Nitrocellulose coatings</td>
<td>GB/T 25271-2010</td>
<td>Nitrocellulose coatings</td>
</tr>
<tr>
<td>7</td>
<td>Alkyd varnish</td>
<td>GB/T 25251-2010</td>
<td>Alkyd resin coatings</td>
</tr>
<tr>
<td>8</td>
<td>Phenolic color paint</td>
<td>GB/T 25253-2010</td>
<td>Phenolic resin coatings</td>
</tr>
<tr>
<td>9</td>
<td>Phenolic resin anti-rust coatings</td>
<td>GB/T 25252-2010</td>
<td>Phenolic resin anti-rust coatings</td>
</tr>
<tr>
<td>10</td>
<td>Amino alkyd color paint</td>
<td>GB/T 25249-2010</td>
<td>Amino alkyd resin coatings</td>
</tr>
<tr>
<td>11</td>
<td>Nitrocellulose color paint</td>
<td>GB/T 25271-2010</td>
<td>Nitrocellulose coatings</td>
</tr>
<tr>
<td>12</td>
<td>Various color nitrocellulose putty</td>
<td>HG/T 3356-2003</td>
<td>Various color nitrocellulose putty</td>
</tr>
<tr>
<td>13</td>
<td>Various color nitrocellulose pencil coatings</td>
<td>HG/T 2245-2012</td>
<td>Various color nitrocellulose pencil coatings</td>
</tr>
<tr>
<td>14</td>
<td>Various color nitrocellulose pencil primer</td>
<td>HG/T 2245-2012</td>
<td>Various color nitrocellulose pencil primer</td>
</tr>
<tr>
<td>15</td>
<td>X06-1 ethylene phosphatizing primer</td>
<td>HG/T 3347-1987</td>
<td>X061 ethylene phosphatizing primer (sub-pack)</td>
</tr>
<tr>
<td>16</td>
<td>Perchlorovinyl resin coatings</td>
<td>GB/T 25259-2010</td>
<td>Perchlorovinyl resin coatings</td>
</tr>
<tr>
<td>17</td>
<td>Perchlorovinyl resin anticorrosion coatings</td>
<td>GB/T 25258-2010</td>
<td>Perchlorovinyl resin anticorrosion coatings</td>
</tr>
<tr>
<td>18</td>
<td>Various color epoxy ester putty</td>
<td>HG/T 3354-2003</td>
<td>Various color epoxy ester putty</td>
</tr>
<tr>
<td>19</td>
<td>Tar epoxy anticorrosion coatings</td>
<td>GB/T 27806-2011</td>
<td>Tar epoxy pitch anticorrosion coatings</td>
</tr>
<tr>
<td>20</td>
<td>Zinc-rich primer</td>
<td>HG/T 3668-2009</td>
<td>Zinc-rich primer</td>
</tr>
<tr>
<td>21</td>
<td>Chlorinated rubber anticorrosion coatings</td>
<td>GB/T 25263-2010</td>
<td>Chlorinated rubber anticorrosion coatings</td>
</tr>
<tr>
<td>22</td>
<td>Acrylic color paint</td>
<td>GB/T 25264-2010</td>
<td>Solvent-based acrylic resin coatings</td>
</tr>
<tr>
<td>23</td>
<td>Alkyd color paint</td>
<td>GB/T 25251-2010</td>
<td>Alkyd resin coatings</td>
</tr>
<tr>
<td>24</td>
<td>Amino paint thinner</td>
<td>HG/T 3380-2003</td>
<td>Amino paint thinner</td>
</tr>
<tr>
<td>25</td>
<td>Nitrocellulose lacquer thinner</td>
<td>HG/T 3378-2003</td>
<td>Nitrocellulose lacquer thinner</td>
</tr>
<tr>
<td>26</td>
<td>Thinner for perchlorvinyl paint</td>
<td>HG/T 3379-2003</td>
<td>Thinner for perchlorvinyl paint</td>
</tr>
<tr>
<td>27</td>
<td>Moisture-proof agents for nitrocellulose coatings</td>
<td>GB/T 25272-2010</td>
<td>Moisture-proof agents for nitrocellulose coatings</td>
</tr>
<tr>
<td>28</td>
<td>Rare earth driers for coatings</td>
<td>HG/T 2247-2012</td>
<td>Rare earth driers for coatings</td>
</tr>
<tr>
<td>29</td>
<td>Paint remover</td>
<td>HG/T 3381-2003</td>
<td>Paint remover</td>
</tr>
<tr>
<td>30</td>
<td>Aluminum paste</td>
<td>HG/T 2456.1-2013</td>
<td>Aluminium pigments for paints—Part1:Aluminium paste</td>
</tr>
</tbody>
</table>

3 Executive Standards for Licensed Products

Five product standards for alkyd baking insulating coatings, amino baking insulating
coatings, various color nitrocellulose pencil coatings, various-color nitrocellulose pencil primer and rare earth driers for coatings, as listed in Table 2, have been revised. The above Table 2 has listed the currently valid standards and all listed standards have come into effect on March 1, 2013.

<table>
<thead>
<tr>
<th>S/N</th>
<th>Variety</th>
<th>Standards</th>
<th>Items not required</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Vinyl chloride anticorrosion coatings</td>
<td>GB/T 25258-2010</td>
<td>Acid resistance</td>
</tr>
<tr>
<td>2</td>
<td>Zinc-rich primer</td>
<td>HG/T 3668-2009</td>
<td>Type I and Class 1 Type II salt spray resistance</td>
</tr>
<tr>
<td>3</td>
<td>Chlorinated rubber anticorrosive coatings</td>
<td>GB/T 25263-2010</td>
<td>Salt spray resistance</td>
</tr>
</tbody>
</table>

4 Inspection Rules for Licensed Products

4.1 Inspection Items

Clause 5.7.2.1 of the Detailed Regulation specifies “all items shall be inspected according to the items and methods specified for relevant products in the national or industrial standards listed in Table 8 wherein, and special items (see Table 9) in the standards are not required to be inspected”. See Table 2 for the contents of Table 9 of the Detailed Regulation. Except two inspection items (acid resistance and salt spray resistance) of the three products listed in Table 2 are not inspected due to their long inspection cycles, other products shall be inspected in accordance with relevant standards.

4.2 Evaluating Principles for the Inspection Results

Clause 5.7.2.2 specifies “The evaluation for the inspection results shall be subject to the requirements of national or industrial standards for the products listed in Table 8. If the inspection results of all items (see Table 8) of the selected samples are qualified, samples shall be evaluated to be qualified; if the inspection result of one item is unqualified, samples shall be evaluated to be unqualified”. In other words, except the two items of 3 products listed in Table 3 are inspected,
samples shall be evaluated to be unqualified as long as one inspection result of inspection items of all other products is unqualified; and despite the fact that the result of on-site qualification by an enterprise is qualified, the enterprise still cannot obtain the production license for that product variety if the inspection quality of one product variety is unqualified.

5 Validity Period of the License

Clause 6.1.2 of the Detailed Regulation specifies “The validity period of the production license is 5 years. If the license expires, the enterprise shall apply to the local provincial level quality and technology supervision bureau for renewing the production license no later than 6 months prior to the expiration date of the production license.” Enterprises must pay attention to this clause and timely apply for renewing the production license.

6 Conclusion

Compared with the previous version, the content of the new one has changed a lot, due to the revision of the inspection standards for most licensed coatings products, especially the expansion for scope of product varieties required to be licensed. At the same time, the defining principles of the variety range, delivery inspection items, necessary inspection equipment of enterprises, etc. for partial products covered by the Detailed Regulation have changed greatly due to the revision of the standards. Enterprises shall timely accurately understand the main contents of the new version and they can make relevant preparations for license renewal in advance and obtain the license smoothly.

In 2014, China Coatings Output Amounted to 16.48 mt, and the Income from Main Business Reached RMB 386.76 bn

The latest statistical data from the State Statistical Bureau show that the accumulated national coatings output in 2014 was 16.48 million tons (based on 1,344 enterprises with annual revenue of RMB 20 million or more, up by 7.9%, including 1.39 million tons, up by 12.7%, in North China; 0.78 million tons, up by 2.3%, in Northeast China; 6.76 million tons, up by 6.8%, in East China; 6.09 million tons, up by 11.0%, in Central South; 1.20 million tons, down by 4.1%, in Southwest China; 0.25 million tons, up by 23.3%, in Northwest China. The top three accumulated outputs realized by Guangdong, Shanghai and Jiangsu were 3.34 million tons, 1.87 million tons and 1.82 million tons, up by 6.9%, 10.5% and 5.4%, respectively.

The latest statistical data also indicate that, based on 1,970 enterprises with annual revenue of RMB 20 million or more nationwide, the coatings industry has realized total asset: RMB 248.22 billion, up by 15.0%; the income from main business: RMB 386.76 billion, up by 11.9%; gross profit: RMB 27.63 billion, up by 12.9%; cost of main business: RMB 316.53 billion, up by 11.9%. In 2014, the top three incomes from main business, realized by Jiangsu, Guangdong and Shanghai, were RMB 96.59 billion, RMB 74.64 billion and RMB 35.73 billion, up by 14.0%, 14.1% and 5.5%, respectively.

The latest data from Chinese customs show that, in 2014, the coatings industry has achieved the accumulated import volume: 0.19 million tons, up by 2.2%; the import amount: $1.06 billion, up by 2.2%; the accumulated export volume: 0.20 million tons, up by 10.9%; and the export amount: $0.72 billion, up by 18.0%. Also in last year, the pigment industry has achieved the accumulated import volume: 0.42 million tons, up by 6.8%; the import amount: $2.18 billion, up by 4.7%; the accumulated export volume: $1.46 million tons, up by 15.9%; and the export amount: $3.66 billion, up by 14.4%.
Analysis on VOC Emission Reduction in China Coatings and Painting Industry

Yuande Yang
(China National Coatings Industry Association, Beijing 100079, China)

Abstract: VOC emission is widely concerned by public and government in China. Particular and toxic pollutants represented by VOC have been the focus of the air pollution prevention and control. This article analyzes the situation of VOC emission reduction in coatings and painting industry, introduces the present air pollution regulations in China, and summarizes the technical measures to reduce VOC emission. Suggestions are made to reduce VOC emission in coatings and painting industries.

Keywords: VOC, Air pollution prevention and control, Coatings and painting industry, Technical measures

1 VOC Emission Reduction in Coatings and Painting Industry

As one of the most prevalent air pollutants, VOC is toxic in itself and can result in photochemical smog and haze, and it has been the important precursor and component for regional composite atmospheric pollution in China in recent years. Therefore, some regulations were made to control VOC emission, for example, in the Notice on Guiding Opinions on Facilitating Joint Prevention and Control of Air Pollution and Improving Regional Air Quality, prevention and control of VOC was listed, and in the Action Plan for Air Pollution Prevention and Control, VOC emission control was stipulated from the production,
transportation, use and other aspects. Therefore, particular and toxic pollutants represented by VOC have been the focus of the air pollution prevention and control.

The coatings and painting industry is one of the largest VOC emission sources in China. However, the current environmental policies mainly focus on the VOC pollution control during the application process of coatings, rather than in the coatings formula design and production, which are actually crucial and decisive for VOC emission. No clear control ideas and concepts have been formed in these aspects. At present, solventborne coatings with high VOC content have higher percentage compared with waterborne coatings. The coatings products are typically classified into architectural coatings, wood coatings, automotive coatings, and anticorrosive coatings (ship and steel structure) in China. Except that there is a relatively high percent for architectural coatings as waterborne type (especially interior wall coatings), other coatings are mainly solventborne. In 2012, the output of coatings in China was about 12.72 million tons, of which the solventborne coatings accounted for about 60%, others are waterborne, powder, UV and other low-pollution coatings. In the same year, solventborne coatings accounted for 40% in America, 35%-40% in Japan and only 30% in Germany. The limit value of VOC content for coatings in China is much higher than that in developed countries, for example, the limit value of VOC content for solventborne coatings in Europe and the United States is 10%-20% lower than that in China. Furthermore, the VOC categories in coatings industry are various and the toxicity of solvents is different. The VOC contents vary greatly in raw materials among different types of coatings, manufacturing processes and formulas. For example, the solvent is xylene or solvent oil for the alkyd resin coatings; butyl alcohol or xylene for the epoxy resin coatings; ethyl acetate, xylene or cyclohexane mixture for the acrylic and polyurethane coatings. It can be seen that the benzene series with strong toxicity are one of VOC in coatings manufacturing and their emission
can be reduced by improving the production formula of coatings in the production and application processes. Finally, the usage control and formula improvement at the sources are critical for VOC emission reduction in the coating industry due to the following problems such as large emission volume in application process, scattered emission sources, incomplete pollution control technologies, difficult pollution control and difficult and costly environmental monitoring in the coating industry. As the exterior walls of buildings, vessels and steel structures must be coated in open space, VOC emission is unorganized without effective monitoring. In addition, the policies on VOC emission reduction in the coatings industry, which emphasize the painting rather than coatings and focus on the end-use control rather than the source consumption reduction, are of high administrative costs and poor monitoring effects. Therefore, the most effective measures for VOC emission reduction in the coatings industry are to directly control VOC content in products or use waterborne coatings and to develop integrated strategies for VOC emission reduction from perspectives of purpose control, formula design, toxicity replacement, usage supervision, etc..

2 Environmental Protection (Air Cleaning) Regulations in China

The original Integrated Emission Standard of Air Pollutants (GB 16297-1996) in China only stipulates the limits on solvents such as benzene, toluene, and xylene, etc. On August 15, 2006, the State Environmental Protection Administration promulgated the Cleaner Production Standard - Automobile Manufacturing (Painting) HJ/T 293-2006, which was implemented on December 1, 2006 and firstly stipulated the specific require-ments for VOC emission value in the domestic industrial painting. The VOC emission limit value of automobile painting in some regions has been set at 20 g/m².

3 Technical Measures for VOC Emission Reduction

To realize the cleaner manufacturing in coatings and painting industries, the VOC emission must be lower than the VOC limit stipulated in cleaner production standard. The specific technical measures are as follows:

(1) Replace traditional solventborne coatings with the low-VOC or VOC-free environmentally friendly coatings (high solid coatings, waterborne coatings, powder coatings, etc.). It will be the efficient measure to solve the air pollution caused by VOC emission. The environmentally friendly coatings such as high solid coatings can be used with slightly change of the painting processes and equipments and can greatly reduce VOC emission. For example, in automobile painting,

![Image](https://example.com/image.png)
the VOC emission may decrease by 30%-40% by increasing the solid content of primer and topcoat by 10%-15% under the same applicable viscosity of automobile coatings. However, it is by no means as easy as reducing the dosage of organic solvent in terms of coatings. In order to maintain almost invariable good application property such as application viscosity, it is necessary to design new formula with new resins and organic pigments with less oil absorption. If waterborne and powder coatings are used to replace solventborne coatings, the painting processes and equipment need to be changed greatly. Therefore, it is better to use waterborne and powder coatings in the newly-built painting lines.

(2) Produce coatings in the continuous, confined and integrated mode. Strengthen the management during production including feeding, mixing, dispersing, tinting and packaging etc.. Reduce the dosage of solvent during color tinting and color matching.

(3) Increase the painting efficiency, especially in the spray application process. Carry out the manual air spray under low pressure and static mode (replace the ordinary spray guns with air static spray guns); overcome interference of the human factors (different skills, responsibilities and health conditions may lead to different spraying quality and utilization rate of coatings); replace manual spray with automatic static spray; replace the reciprocating automatic cup-type spray with robot automatic cup type static spray; take measures to rationalize, control and intellectualize the painting condition to reduce over spray and increase spray efficiency.

(4) Strengthen solvent management to reduce the dosage of organic solvent. Strengthen the on-site solvent management, such as recycling solvent used to clean guns; make grouping, arrangement and unification of the colors to reduce the times of color tinting, namely, reduce the gun cleaning frequency and the loss of solvent for cleaning guns; and cover paints and solvent container. Improve and optimize the equipment; reduce the dosage of diluents; configure solvent-recyclable devices; and shorten coatings management line. In the automobile
static spray process, selection of the magazine-typed rotary cup paint supply system can reduce the loss of coatings and solvent on the color tinting process by 93%. The adjustment of wind speed in painting room can also reduce the VOC emission.

(5) Strengthen the downstream control of VOC emission. Arrange exhaust gas treatment devices in the coating production and painting workshops to reduce the emission of VOC that pollutes the atmosphere. As VOC is usually flammable or combustible organic chemical compound, the exhaust gas can be treated by methods such as the direct combustion, catalytic combustion or adsorption. Under the condition that gas and fuel oil are used as the heat source of the drying chamber, the exhaust gas from the drying chamber is generally burnt directly and the heat is recycled for comprehensive utilization. It is usually difficult to treat the exhaust gas in the painting room because of its large emission amount and low VOC concentration. At present, treatment devices are available for integrating the absorption and combustion methods.

4 Suggestions for VOC Emission Reduction in Painting Industry

(1) With reference to the foreign experience of relevant VOC laws, regulations and standards, it is suggested to make clear the types and categories of VOC-contained solvents in Chinese painting industry, systematically identify and assess their environmental hazards, sort out and summarize the shortages of existing technologies, standards and the policy systems for the coatings and painting industries, and develop integrated control strategies, technical systems and policy systems for purpose control - formula design - painting process on the basis of the experience of pollution control strategies and policies in the international coatings and painting industries and the current development situation and pollution
control requirements in Chinese coatings and painting industries, so as to effectively reduce VOC load, use and emission in the coatings and painting industries and reduce the VOC emissions of the industrial sources nationwide.

(2) Strengthen the propaganda of environmental protection and the enforcement of cleaner production regulations.

(3) Promulgate relevant incentives and preferential economic policies, such as environmental and economic policies, tax policies, price policies, emission-right trading policies, etc.; reward and praise the enterprises to adopt cleaner production and the enterprises with the international level standards; and reward contributive scientific achievements and personnel. These policies will constitute important contents for the performance assessment of regional officials. In addition, the accountability system and one-vote veto system should be strictly implemented.

(4) Environmentally friendly products and cleaner production are encouraged to reduce VOC emission. It is the technical trend to gradually replace present traditional solventborne coatings with the introduction and development of environmentally friendly coatings to meet the VOC emission requirements.
Development of Relevant Regulations on Automobile Coating Business at Home and Abroad

Fucheng Yan
(Axalta Coating Systems)

1 Relevant laws and Regulations on Domestic Automotive Coating

Ever since the introduction of the first edition for HJ/T 293-2006 Cleaner Production Standard-Automobile Manufacturing (Painting) by the Ministry of Environmental Protection (MEP) in 2006, related laws and regulations have been established one after another. For example, in November 2011, the Ministry of Industry and Information Technology enacted the Administrative Rules for the Access of Passenger Vehicle Manufacturers and the Products and put it into effect since January 1, 2012. In September of the year, the State Council also approved the 12th Five-year Plan on the Prevention and Control of Air Pollution in Major Regions. According to these national standards and regulations, the technical routes for new vehicle manufacturing and coating production should be adopted to closed and automatic coating lines. Besides, the primer and topcoat used in the process should be waterborne paint; the percentage of low VOC coatings such as waterborne paint should be no less than 80% of the overall usage; and the emission of VOC per unit coating area of light passenger vehicles should not exceed 35 g/m².

In addition, GB 24409-2009 Limit of Harmful Substances of Automobile Coating, a national standard promulgated by the Administration of Quality Supervision, Inspection and Quarantine and the Standardization Administration of PRC...
In September 2009, expressly stipulated the maximum content of VOC in the application of coating materials as well as the limit of four heavy metals ($\text{Pb, Cr}^{6+}, \text{Cd, Hg}$) and health-risky solvents. Moreover, GB 19578-2004 *Limits of Fuel Consumption for Passenger Cars* and GB 20997-2007 *Limits of Fuel Consumption for Light Commercial Cars* strictly stipulated the fuel consumption limits. The *Provisions for the Limits on the Harmful Substances Usage in Automobile Products and Recycle Rate*, which are executed soon, also stipulated the limits for lead and chrome usage.

With the successive enactment of many stringent local regulations, the implementation of anti-pollution measures even gets strengthened. On October 22, 2010, the government of Guangdong Province established DB 44/816-2010 *the Emission Standard of VOC for Surface Coating (Automobile Manufacturing Industry)*. Turning into its second phase on January 1, 2013, the standard now regulates that the emission of VOC per unit coating area of both existing coating lines and newly built ones should be lower than 20 g/m$^2$. Besides, Tianjin Municipality also issued a local standard on July 31, 2014, namely DB 12/524-2014 *the Emission Control Standard of VOC for Industrial Enterprises*, and put it into effect on the next day. According to the standard, the emission of VOC per unit coating area of light passenger vehicles for existing automobile coating lines should be lower than 45 g/m$^2$ from January 1, 2016. Since the implementation of the new standard, the VOC emission limit for new enterprises shall be lower than 35 g/m$^2$.

Meanwhile, Shanghai Municipality has published a directory for common VOC in April, 2014, which contains 289 organics and glycol ethers in key industries. The *Emission Standard of Air Pollutants for Surface Coating of Automobile Manufacturing Industry*, drafted by Shanghai Environmental Protection Bureau and Shanghai Quality and Technical Supervision, is also under review and will be issued soon. Furthermore, the *Emission Standard of VOC for Surface Coating of Automobile Manufacturing Industry* in Shanghai, Chongqing and Beijing are also expected to be executed soon.

Meanwhile, many related industry regulations, which regulates a broad area ranging from the detailed technical specification of materials to the requirement for the content of VOC, have also been enacted intensively. In September 2013, the Ministry of Industry and Information Technology

2 Brief Introduction to Relevant Laws and Regulations on Oversea Automobile Coatings

**European Union:** According to DIRECTIVE 1996/61/EC, an instruction consisting of comprehensive measures for pollution prevention and control issued by the Union in 1996, those bodyshops whose VOC consumption surpasses 200 tons annually should adopt optimal processes and technologies. Three years later, EU promulgated DIRECTIVE 1999/13/E, another instruction that made specific requirements on solvent emission for different vehicle models and production lines. For those existing production lines whose solvent consumption surpasses 200 tons, their VOC emission should be limited at 60 g/m² in a unit coating area. As for those newly-built coating lines, the very standard should be kept at 45 g/m². In terms of those light vehicles whose annual usage of solvent surpasses 15 tons, the VOC emission in a unit coating area should be lower than 35 g/m² in 2007, no matter being present lines or newly built ones. In 2001, the national standards of VOC emission for a unit coating area is regulated at 35 g/m² by many European countries such as Germany, Austria, Czech Republic, Finland, Slovakia, Sweden, etc.. The same year also witnessed many enterprises accepting the above standard as an optimal technical standard for emission rate including Volkswagen Group, BMW, Mercedes-Benz, Opel/Saab, Toyota, Volvo, etc.. In 2011, automobile enterprises such as Ford, Fiat, Peugeot/Citroen and Renault defined their own emission rate as 60 g/m² for existing sources. In the control technology document for optimal processes updated in 2007, the level of emission targets was described as 10-35 g/m². Three years later, the optimal processes aforementioned was approved in a directive for industrial emission. In
In terms of vehicle maintenance and refinish, DIRECTIVE 2004/42/EC by EU also raised limits for VOC emission based on different coatings and product categories. The limit is regulated for those organic solvents in paints and clearcoat that used for refinning vehicles.

**US:** The Clean Air Act (version 1990) established by EPA introduced different policies for different discharge rate: for those operation sites whose VOC emission surpasses 10 tons, they should adopt reasonably available control technology with an emission rate of 50 g/m². For those new and large-scale operation sites whose emission load of one of the six common pollutants (NOₓ, SO₂, CO, VOC and PM) surpasses 100 tons, they should introduce the best available control technology with the emission rate for VOC at 42 g/m². For those new and large-scale operation sites whose emission load of one of the five common pollutants (NOₓ, SO₂, CO, VOC and PM) surpasses 100 tons, they should accept the lowest achievable emission rate with the emission limit for VOC being 35 g/m². According to the 2008 national ambient air quality standards, the upper limit for ozone value should be set at 150 µg/m³ (8 hours). And those areas which higher values would be defined as non-attainment areas and perform related management plan for ambient air quality.

**Japan:** With reference to the emission standard of VOC in Germany, Japanese government started to construct and rebuild its domestic automobile coating lines from 2000. In 2005, it promulgated Decree 188 and 189, ordered that limit the concentration of VOC discharged from the exhaust fans in automobile coating lines to 700 ppmc with newly built ones maintaining 400 ppmc (ppmc is the unit for carbon intensity).
Originally set at 25 g/m², the VOC emission rate of Toyota Motor Corporation actually performed better at less than 10 g/m² with the help of waterborne 3C1B coating process.

**Korea:** According to the *Korean Protection Law for Atmospheric Environment* revised in 1995, the emission rate of VOC should be decreased by 50% in five years.

### 3 Conclusion

When compared the environmental protection laws and regulations for automobile paints and coating at home and abroad, we could find out that the policy trends of all relevant national are quite alike, since both of them have proposed more rigorous emission restrictions on air pollutants, much lower emission level of VOC, and more stringent requirements towards coating businesses. As for differences, we also noticed that those oversea laws and regulations paid more attention to standards and limitations by clarifying the varieties of HAPs and offering best available technology instead of confining technological routes, measures and innovations. However, here in China, related regulations only emphasized practice level details, and sometimes they even forced related businesses to use specific technical routes and processes instead of encouraging them to develop new technologies and make innovations so as to reduce the emission of VOC. Since these laws and regulations are concerned about the varieties and lists of VOC, there appeared many testing methods and different explanations to one standard. So far, national regulations only specify limits on hazardous substances in automotive coatings.
CNCIA Main Activities (October-December 2014)

October

Oct. 11-19 Germany
CNCIA Delegation Attended the European Architectural Coatings Forum

Oct. 30 Yantai
The 8th Session of the 7th Standing Council of CNCIA

November

Nov. 4-6 Beijing
Inaugural Meeting of Art Coatings and Painting Branch and the 7th China Wall Art Forum

Nov. 13 Shunde
Annual Meeting (2014) of Architectural Coatings Branch

Nov. 28 Langfang
Central Purchasing Symposium on the Strategic Cooperation between Real Estate and Coatings Industries

Nov. 29 Panzhihua
Annual Meeting (2014) of Titanium Dioxide Branch

December

Dec. 19 Beijing
Waterborne Wood Coatings Industrial Technology Alliance visited Beijing Qumei Furniture Group Co., Ltd.

Dec. 20 Beijing
Inaugural Meeting of Military Coatings and Painting Professional Council of CNCIA

Dec. 23 Beijing
The 2nd Session of Peking University Coatings Enterprises Senior Talents Seminar
Art Coatings and Painting Branch of CNCIA was Founded in Beijing

On November 4th-6th, 2014, the Inaugural Meeting of Art Coatings and Painting Branch and the 7th China Wall Art Forum has been launched in Beijing, with representatives from 60 domestic enterprises in Art Coatings and Painting industry. Lianying Sun (President of CNCIA), Yuande Yang (Secretary General of CNCIA), Ren Zhang (Secretary General of China Architectural Decoration Association) and Shangyuan Jiang (Executive Director of International Design Association) attended the Meeting.

Lianying Sun, President of CNCIA, proposed to improve the art coatings branch from four aspects: to improve the technical training of painting workman for the advancement of technology and the modernization and specialization of management; to promote the industrial development, regulate the market order, standardize the industrial behavior and protect the legal rights of enterprises; to speed up the development of environmentally friendly products in accordance with the national environmental policies; to catch up with international Art Coatings and Painting market. Meanwhile, the first Council of Art Coatings and Painting Branch of CNCIA has been elected.
The 2nd Session of Peking University Coatings Enterprises Senior Talents Seminar was Held in Beijing

On December 23rd, the 2nd session of Peking University Coatings Enterprises Senior Talents Seminar, which was jointly hosted by CNCIA and Guanghua School of Management at Peking University and co-organized by Wanhua Chemical Group Co., Ltd., completed satisfactorily. In the seminar, the number of the trainees surged to over 70. And the courses involved the 16th Peking University Guanghua School New Year Forum, Symposium of Coatings industry, and courses lectured by famous professors.

On December 21st, the trainees attended the 16th Peking University Guanghua School New Year Forum on Cultural Reshaping and Economic Transformation. This Forum focused on the soft and hard power of China’s economic development, and explored to remodel the culture advantage by innovative and entrepreneurial spirit, to guide structure upgrading by the smooth economic transition, to release the dual powers, to innovate the renewal and to realize the Chinese dream.

During the seminar, Dr. Weiqi Hua, the Senior Vice President and Chief Technology Officer in Wanhua Chemical Group Corp., Ltd., presented the Chemical Industry Trend and Wanhua Strategy. In the opening ceremony of the class, Lianying Sun, President of CNCIA, claimed that in retrospect of 2014, the China coatings industry overcoming the pressure of economic downturn had leveled off with better indicators than 2013. And she emphasized that with the further reasonable product structure, the industry would transform from the rapid growth in previous years to balanced growth in the future. Later, the renowned professors Qi Li, Changhui Zhou and Jianjun Zhang from Guanghua School lectured respectively on the topics of China’s Economy and Society, Enterprises Transformation and Upgrading and Art of Leadership with Combination of Chinese and Western Styles.

This workshop constructed a platform that could function positively to assist the coatings enterprises to detect the economic trend, upgrade the management and cultivate talents in the coatings industry. Thus facing the sophisticated economic environment, the coatings industry would secure a prosperous future in the economic New Normal!
Introduction to China Coatings Show 2015

Background

China Coatings Show is a major international exhibition in coatings fields, which is co-organized by China National Coatings Industry Association (CNCIA) and Beijing Tubo International Exhibition Co., Ltd. It is one of the important activities.

CNCIA will organize a series of activities in the Year of China International Coatings, taking the theme of "progress of 30 years in the journey of 100 years, chasing the dream of a powerful coatings nation". China Coatings Year 2015 includes a series of activities: the Centennial Celebration of Modern China Coatings Industry, the 30th Anniversary Celebration of CNCIA, and the serial activities of "For Beautiful China, Coatings Industry is in Action", China Coatings Show 2015, the APIC meeting etc..

Exhibition venue: Shanghai New International Expo Center, E4 Hall;
Exhibition area: 20 000 square meters;
Set-up and layout time: June 28-29, 2015;
Show time: June 30 to July 2, 2015;
Move-out time for exhibitors: after PM 14:00 on July 2, 2015;
The exhibition theme: Science and Technology Innovation, Model Innovation and Service Innovation;
The organization of the exhibition: three sub-exhibitions including coatings products, raw materials products and coating equipments; eight exhibition areas including waterborne coatings area, industrial coatings area, special coatings area, resin/emulsion area, pigment and fillers, additive area, coatings equipment area, painting equipment area.

Concurrent Activities

Annual Coatings Information Meeting 2015
APIC Meeting
Waterborne Wood Coatings and Painting Solution Plan Training
Waterborne Anticorrosion Coatings Seminar
Thermal Insulation Coatings Seminar
Scale Manufacturer Distributor Meeting
Coatings Engineers Salon

Scope of Exhibits

Raw Materials and Additives, etc.
Including: natural, synthetic resin and intermediates; pigment, filler, filler and dye; solvents and plasticizer, functional additives; functional materials; functional coatings and printing ink; nanometer materials and so on.

Production/Packaging Equipment and Devices, etc.
Production equipment and devices; blender/mixer and high-speed dispersion machine; handing and packaging; charging and mixing/color matching system; automation and internal management; filters, pumps, meters/weighing device; grinding machine and its accessories; packaging and labeling machine; filling equipment; spraying equipment; coating equipment, etc..

Quality Control and Lab Instruments, etc.
Color and other visual characteristics; measuring and testing; dry film and mechanical properties (including durability); chemical properties; coating characteristics (viscosity, rheological property, wettability, etc.); surface analysis; experimental materials; analysis instrument and so on.

Safety, Health, Environment and Other Services
Daily workshop management; waste processing and treatment; packaging and waste reduction; environment protection and safety equipment; technical information; recovery/recycling; healthy and easy clean surface; environmental protection technology; consulting and so on.

Coatings
Architectural coatings (including external coatings, waterproof coatings, fire retardant coatings and floor coatings, etc.), road traffic coatings, coil coatings, wood coatings, automotive coatings, shipping/marine paint, container paint, engineering machinery coating anticorrosive coatings, high speed rail bridge coatings, wind/nuclear power/solar energy coatings, light industry coatings, plastic coatings, metal coatings, UV curing coatings, powder coatings, special functional coatings and related environmentally friendly coatings.