Recent Regulatory Developments in Plastics Additives in China

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In Western Europe, the environmental effects of some plastics additives – in particular, halogenated flame retardants and phthalates used as plasticizers – have been discussed for more than a decade. After intensive studies and assessments, the use of several of these compounds has been restricted.

In European studies, four phthalates – di(2-ethylhexyl)phthalate (DEHP), dibutyl phthalate (DBP), diisobutyl phthalate (DIBP), and n-butyl benzyl phthalate (BBP) – were found to have adverse endocrine-related effects in laboratory animal studies. The use of two of them, DIBP and BBP, is now prohibited in REACH-related applications. The other two, DEHP and DBP, are categorized as "damaging fertility and the unborn child", and their use is restricted in some applications such as toys.

The EU directive known as RoHS2, which restricts the use of certain hazardous substances in electrical and electronic equipment, gives upper limits for the use of polybrominated biphenyls (PBB) and polybrominated diphenyl ethers (PBDE) of 0.1% as flame retardant in homogenous materials, therefore also shifting demand away from these materials to non-halogenated materials.

With regard to environmental protection, China has in the past generally been somewhat behind Western European standards. For example, the level of European fuel standard Euro V (implemented in 2009) will approximately be reached by the standard China V, which will be phased in during 2017. So how is the situation for plastics additives, both the specific cases mentioned above and in general? What other regulations may producers of plastics additives face in the Chinese market?

Generally speaking, environmental issues have certainly become more and more important in China. Some problems such as air and water pollution have become very obvious and drawn the attention of both ordinary citizens and the government. As a consequence, the most recent Five-Year Plan (the 13th, for the period from 2016 to 2020) has environmental protection as one of the five core themes. This theme trickles down to the plans for the individual areas, such as the plan for the chemical and petrochemical industry. A number of measures in this plan will certainly also have an impact on the producers and users of plastics additives. Here are a few examples:

* The 13th Five-Year Plan strongly promotes moving chemical production into dedicated chemical parks, where currently only about 45% of plants are located. Individual provinces have even set fixed targets for the proportion of plants to be moved into chemical parks. This regulation may strongly affect all those producers of plastics additives which currently operate outside of chemical parks. However, it may also cause disruption in the raw materials supply for plastics additives and possibly also on the demand side.

* The plan also has a number of general environmental targets, such as the substantial reduction of water consumption, energy consumption and carbon dioxide emission per unit of GDP. The targeted 30% reduction of volatile organic compound emissions for key industries including chemicals by 2020 may force some producers of plastics additives to upgrade their emission treatment technology, or to reduce production.

* For New Chemical Materials, which by the Chinese definition includes engineering plastics, the plan sets a target for self-sufficiency – this is to rise from 63% in 2015 to 82% in 2020. This is an example for regulation which may actually positively affect the demand for plastics additives

in China. An increased share of domestic production of engineering plastics rather than a reliance on imports will go along with a larger domestic demand for the relevant plastics additives.

How about the areas which have caught the most attention in Europe – the phthalates and the halogenated flame retardants?

Start with the phthalates. In 2016, China enacted the Toy Safety National Standard GB6675-2014, which limits the content of 6 phthalates in toys to 0.1% (the same limit is given in an earlier regulation, "Limit of Harmful Substances of Coatings for Toys, GB 24613-2009). This regulation seems to be modelled after the European regulation as it sets the same limits. In addition, further restrictions for the use of phthalate plasticizers are under discussion in the area of plastics packaging. To facilitate recycling of such packaging, a draft regulation on this topic prohibits the use of phthalates in plastics packaging along with other substances that may make recycling more difficult. Currently this is only a draft, with no clear implementation date set. However, a number of foreign companies including Lanxess and Sabic already promote their phthalate-free alternatives in China.

In addition, the 13th Five-Year Plan for the chemical industry specifically mentions the substitution of phthalates by bio-based plasticizers, presumably in an attempt to pursue two goals simultaneously, increased sustainability via use of a renewable resource and greater environmental protection.

For halogenated flame retardants, so far there is no regulation targeting plastics applications in China. As a consequence, the use of flame retardants in plastics tended to be much lower than in Western markets, and a large share of domestically produced flame retardants is exported. However, recently some of the domestic producers have been adapting their products to comply with regulations in other regions, such as REACH, ROHS, etc. And China has enacted its own regulation for electronic products, which so far not restricts the use of materials such as PBB and PPDE, but mandates that these substances are already to be indicated, possibly hinting at a later prohibition. Stricter building codes in China will likely also increase the overall domestic demand for flame retardants.

Global producers of non-halogenated flame retardants have taken note. In 2016, Budenheim announced that they will strongly increase their capacity for ammonium polyphosphate, a non-halogenated flame retardant, at their Chinese production site as a consequence of the strong growth in Asia. BASF in China has started promoting a polymeric flame retardant in expandable polystyrene, PolyFR, which replaces the flame retardant hexabromo cyclododecane (HBCD).

However, the most important and relevant change for plastics additives producers related to regulation may be a tightened implementation of existing regulation. A number of factors have led to this development.

One of them is the series of explosions in chemicals warehouses in Tianjin in 2015, which caused about 180 deaths and billions of dollars of damages. The severity of the explosions was largely caused by non-compliance with existing Chinese regulation rather than a lack of regulation in the first place. This is aligned with the opinion of industry experts that in general local implementation of existing regulation is the weakest link in China's environmental protection and safety efforts.

Second, the pressure on chemical companies to comply with existing regulation has increased substantially. In many chemical segments, there have been reports about factory closures or capacity reductions due to noncompliance with environmental regulation. The government has also started to punish wrongdoers much more severely.

Certainly, the stricter implementation of environmental regulation will increase for those producers of plastics additives which did not comply with regulation in the past. Potentially this may lead to a market consolidation as generally, smaller producers tend to be less compliant and also have less resource to upgrade their production equipment to meet higher emission standards.

Finally, it should be pointed out that the growth rate of China's economy will also have major impact on the market for plastics additives. The government has set a target of an annual GDP growth of at least 6.5% to 2020. For the chemical industry, the comparable value has been set at 8%. However, the government aims to focus this growth in the area of higher-value chemicals at the expense of commodities. For example, the government forecast for annual PVC growth to 2020 is only 4.6%. So, for certain plastics additives such as PVC plasticizers, demand growth may end up being well below GDP growth. ■