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Tyre Testing

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As tyre is one of important industrial products, global tyre industry is on rapid development along with the boom of auto industry in the world. China, the global manufacturing center, is the largest country for tyre manufacture and export. However, there are more challenges for tyre businesses in China on export when awareness for environmental protection is constantly strengthened and regulations from various countries are issued, especially after Sino-US Tyre Special Safeguard Case.

According to REACH, responsibilities and obligations of tyre focus on two aspects:

REACH, i.e., "Registration, Evaluation, Authorisation and Restriction of Chemicals", is an European Union regulation on preventative management for all chemicals to be placed in its market. The regulation officially took into force on 1 June 2007 and was implemented on 1 June 2008.

• Information Communication in SVHC Supply Chain

Before tyres are placed in the EU market, SVHC contained therein shall be specified by suppliers and such information shall also be given to downstream importers according to REACH Regulation. When SVHC is present in the products above a concentration of 0.1% by weight, the suppliers shall provide their downstream importers with sufficient information, or provide sufficient information to them for free within 45 days at the request of customers.

Solution

Components of tyres are complicated, among which basic raw chemical materials such as rubber oil, carbon black, rubber ingredient and etc. may lead to great risks. So it is advisable that tyre producers should cooperate with their upstream suppliers to confirm SVHC content of the products and communicate relevant information with their downstream importers in a timely manner.

• Hazardous Substance Testing of PAHs

PAHs usually exist in petrochemical, rubber, plastics, lubricant, antirust oil and organic compounds of incomplete combustion. Partial PAHs remain in the products due to its application in manufacturing process such as that of plastics, dyes and pesticides. There may also be PAHs in rubber and plastic parts, as well as paint and coating of electricals & electronics, toys and childcare products.

REACH Annex XVII has placed a restriction (refer to Table 1) on 8 PAHs in tyres, their spare parts, retreads, treads and extender oil. Products cannot be placed in the EU market if they fail to comply with the standards.

Table 1: Restriction on PAHs in Tyres and Extender Oil in REACH Annex XVII

Standard	Products shall not be exported if sum of 8 PAHs exceeds the limit stipulated in REACH Annex XVII
BENZO[a]PYRENE(BaP)	1 mg/kg
Sum of 8 PAHs	10 mg/kg

In addition, there are different test methods for products in REACH Annex XVII:

- IP346:2004 is used for measurement of PAHs in extender oil, but it will go invalid upon 23 September 2016 according to the amendment of (EU)2015/326;
- EN 16143 will formally supersede IP 346 from 23 September 2016;
- Nuclear magnetic resonance (NMR) method is applied to measure the content of PAHs in vulcanized rubber according to ISO 21461.



Solution

There is great risk for materials such as rubber oil, carbon black, chemical additive and reclaimed rubber, especially when qualities of raw materials are uneven. Enterprises shall pay heed to controlling total PAHs in tyres (finished products) while monitoring PAHs in raw materials by cooperating with suppliers and conducting regular inspection and re-testing to ensure that the content conforms to regulations.

Requirements of GS Mark Certification in Germany

In August 2014, the German Committee' Technische Arbeitsmittel und Verbraucherprodukte (AtAV)' published new regulatory requirements on PAHs for GS Mark certification. The new standard AfPS GS 2014:01 PAK will replace the previous ZEK 01.4-08 since 1 July 2015.



Table 2: List for GS MARK PAHs (PAHs Comparison between EU REACH Annex XVII and US EPA)

Compound	CAS NO	REACH Annex XVII	US EPA	GS MARK PAHs
NAPHTHALENE	91-20-3		V	V
ACENAPHTHYLENE	208-96-8		V	V
ACENAPHTHENE	83-32-9		V	V
FLUORENE	86-73-7		V	V
PHENANTHRENE	85-1-8		V	V
ANTHRACENE	120-12-7		V	V
FLUORANTHENE	206-44-0		V	V
PYRENE	129-00-0		V	V
BENZO(a)ANTHRACENE	56-55-3	V	V	V
CHRYSENE	218-01-9	V	V	V
BENZO(b)FLUORANTHENE	205-99-2	V	V	V
BENZO(k)FLUORANTHENE	207-08-9	V	V	V
BENZO(a)PYRENE	50-32-8	V	V	V
DIBENZO(a,h)ANTHRACENE	53-70-3	V	V	V
INDENO(1,2,3-cd)PYRENE	193-39-5		V	V
BENZO(g,h,i) PYRENE	191-24-2		V	V
BENZO[j] FLUORANTHENE	205-82-3	V		V
BENZO[e] PYRENE	192-97-2	V		V

Limit and Transitional Period

To comply with new requirements on PAHs, the German Committee' Technische Arbeitsmittel und Verbraucherprodukte (AtAV)' published AfPS GS 2014:01 PAK to supersede ZEK 01.4-08 with the transitional period from the publishing date to 1 July 2015. The requirements are as the following:

- (1)The limits of PAHs in consumer products shall be subject to new requirements;
- (2)Toys shall be subject to the new requirements on PAHs limits as otherwise stipulated;
- (3)GS Mark certificate of products that issued after 1 July 2015 shall comply with the stipulation of the new standard AfPS GS 2014:01 PAK.



Table 3 The limits on PAHs for GS MARK shall comply with the following table according to AfPS GS 2014:01 PAK:

Parameter	Category 1	Category 2		Category 3	
	Materials intended to be put in the mouth, or materials of toys with intended long-term skin contact (longer than 30s)	Materials not covered by Category 1, with foreseeable skin contact for longer than 30 seconds (long-term skin contact) or repeated short-term contact		Materials not covered by Category 1 or 2 with foreseeable skin contact up to 30 seconds (short-term skin contact)	
		Toys in the scope of 2009/48/EC	Other products	Toys in the scope of 2009/48/EC	Other products
ACENAPHTHYLENE, ACENAPHTHENE, FLUORENE, PHENANTHRENE, PYRENE, ANTHRACENE, FLUORANTHENE	<1mg/kg	<5mg/kg	<10mg/kg	<20mg/kg	<50mg/kg
NAPHTHALENE	< 1mg/kg	< 2mg/kg		< 10mg/kg	
Respective limits of other 10 PAHs	< 0.2mg/kg	< 0.2mg/kg	< 0.5mg/kg	< 0.5mg/kg	< 1mg/kg
Total of 18 PAHs	< 1mg/kg	< 5mg/kg	< 10mg/kg	< 20mg/kg	< 50mg/kg

Our Testing for PAHs

8 PAHs of EU REACH

18 PAHs of GS Mark certification in Germany

16 PAHs of US EPA

C&K Testing hereby reminds enterprises that REACH regulates tyres of sedans, light trucks, engineering machinery, motors and etc. We can ensure the good performance of obligations for regulation and safeguard the safety of trade only when requirements for SVHC and PAHs are fulfilled at the same time.

Attentive Services

C&K Testing also renders five extra services while providing strong technical support:

- Special offers for testing on a regular basis;
- Management and integration of suppliers for free;
- Sharing of the latest technical news;
- Door-to-door training and orientation for suppliers;
- Customised solutions.

About Us

C&K Testing is a leading testing company to render you specialised solutions concerning green and sustainable development of products. Established in 2008, we've helped thousands of customers to minimise the risks of their products to human health and the environment through our testing services.

Contact Us

Hangzhou

Address: 1/F, No.4 Building, Huaye Hi-Tech Industrial Park, No.1180, Bin'an Road, Binjiang District, Hangzhou, Zhejiang, China
Tel: +86-571-87206587
Fax: +86-571-89900719
Email: test@cirs-group.com

Ireland

Address: Singleton House, Laurence Street, Drogheda, Co. Louth, Ireland
Tel: +353-41-9806916
Fax: +353-41-9806999
Email: louise@cirs.ie