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# 中国防爆安全技术与管理体制

## The Explosion Protection Infrastructure in China

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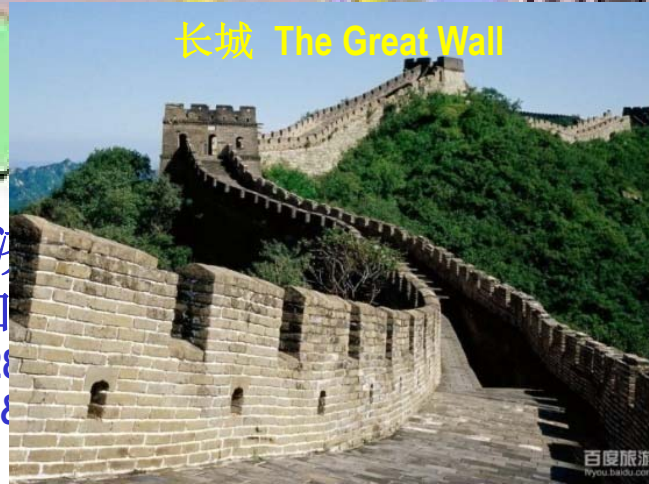
# 中国概况介绍

Brief introduction to the PR of China

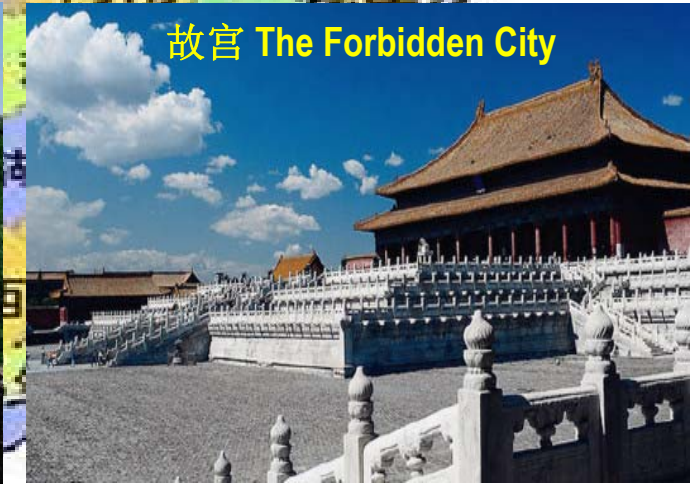
**中国**是统一的多民族国家，共56个民族，13.6亿人口，国土面积约960万平方公里 - a unified, multi-national country, with 56 ethnic groups, a population of 1.36782 billion, land area 9.634 mil.km<sup>2</sup>



天安门 The Tiananmen Square



长城 The Great Wall



故宫 The Forbidden City

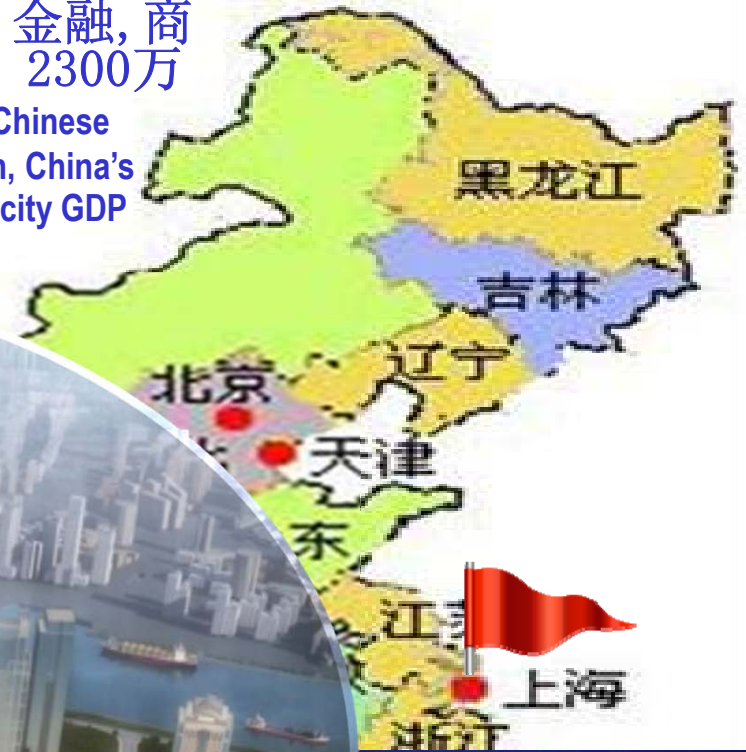




# 中国概况介绍

Brief introduction to the PR of China

**上海**位于长江入海口，是中国经济，金融，商业中心，GDP位居全国城市之首，2300万人口- **Shanghai**, located in the Mouth of Chinese Yangtze River, with population of 23 million, China's economic, financial & business Center, city GDP ranks first in China



上海电视塔  
Shanghai TV Tower

上海外滩  
The Bund of Shanghai

632米上海中心大厦 Shanghai Tower 632 m high!





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# 防爆工业无处不在 Ex-related industries - everywhere

伴随着中国经济快速发展，防爆相关工业无处不在！  
With rapid development of Chinese economy, Ex-related industry is everywhere !

- 石油、天然气开采 oil and gas tankers, drilling ship and FPSO
- 炼油、化工企业 oil refineries, Chemical processing plants
- 燃油/燃气充装站 refuelling stations or petrol stations
- 制药业 pharmaceutical industry
- 运输、气体管线和输配站 transportation, gas pipelines and distribution centres
- 分析实验室 analysis laboratory
- 表面喷涂工业 surface coating industries
- 印刷工业 printing industries

- 电子器件制造业 electronic component industry
- 地下煤矿工业 underground coal mines
- 污水处理厂 sewerage treatment plants
- 医院手术室 hospital operating theatres
- 制糖业 sugar refineries
- 纸业和纺织业 paper and textiles
- 木材加工区 woodworking areas
- 粮食处理和储存 grain handling and storage
- 金属表面研磨，特别是铝粉和粒子 metal surface grinding, especially aluminium dusts and particles.

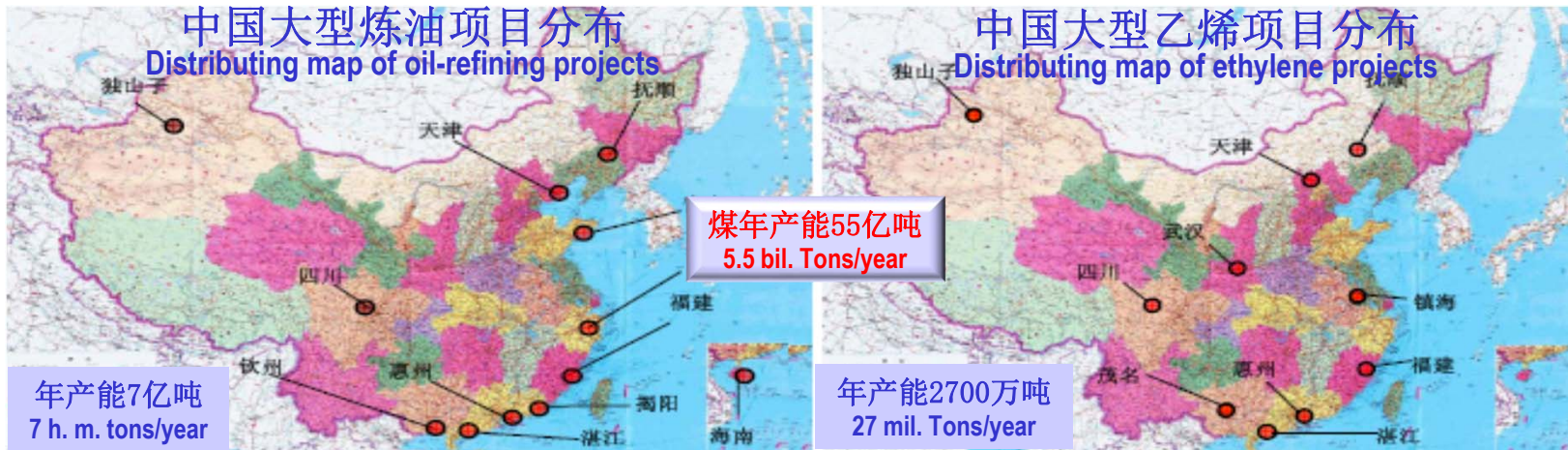
气体  
Gas

粉尘  
Dust



# 防爆工业发展迅速 The booming Ex-industries in China

- 作为世界第二大经济体，中国在“十二五”末石化产能已是世界第一，是世界第二大石油消费市场、第一大原油进口国、第一大原油消耗增长国。As the world's second largest economy, by the end of 12<sup>th</sup> Five-Year, the production capability of petrochemical products in China is the largest one in the world, the 2<sup>nd</sup> oil consumption market, 1<sup>st</sup> oil importing country and 1<sup>st</sup> oil consumption growth country in the world.



- 按“十三五”规划，就石化工业中国将稳产石油天然气、优化升级传统化工工业、大力发展化工新材料、现代煤化工和生物化工。According to 13<sup>th</sup> Five-Year, the petrochemical industry in China will steadily produce gas & oil, optimally upgrade traditional chemical industry, vigorously develop new chemical materials, modern coal chemical industry and biochemical engineering.
- 加上新能源和清洁能源广泛利用，中国无疑是防爆产品和服务需求最具潜力的市场。With extensive utilizing new and green energy sources, China will be the most potential market of Ex equipment and service demand.



# 危险有害因素 dangerous and hazardous factors

火灾 fire

爆炸 explosion 灾难性 serious disaster、毁灭性 absolutely destroyed

中毒 poisoning

灼伤 burn

触电 e



噪声 noise



高



harm



# 事故调查 Survey on significant incidents

- 调查数据显示，特大爆炸事故呈现明显增长态势。 Survey indicates that the number of explosion/burns is increasing.
  - 昆山中荣8.2金属粉尘爆炸事故：死伤237(146+91)人，直接损失30.51亿元 – Metal dust explosion in Kunshan China in 2014, 237(146+91) casualties, direct lost of 3.051billion Yuans..
  - 台湾新北6.27粉尘燃爆事故：死伤510(12+498)人 – Dust explosion in Taiwan in 2015, 510(12+498) casualties.
  - 天津瑞海危化品仓库爆炸事故：死伤963(165+798)人，直接损失68.88亿元 – Chemical warehouse explosion in Tianjin China in 2015, 963(165+798) casualties, direct lost of 6.888 billion Yuans.
- 事故原因主要有三大因素： Three major factors of accidents:
  - 物的因素（直接原因） - Facilities (immediate reason)
  - 人的因素（间接原因） - Human (indirect reason)
  - 管理的因素（间接原因） - Management (indirect reason)
- 为确保安全发展，中国安全主管部门正强化安全生产责任落实，加大产业安全监管力度。 For safety development, Chinese safety department is strengthening safety responsibility, make efforts to increase industrial safety supervision.





# 爆炸可以防治 Explosion can be prevented!

**基本理念：置换、控制、缓解**  
**Basic idea: Substitution, Control, Mitigation**

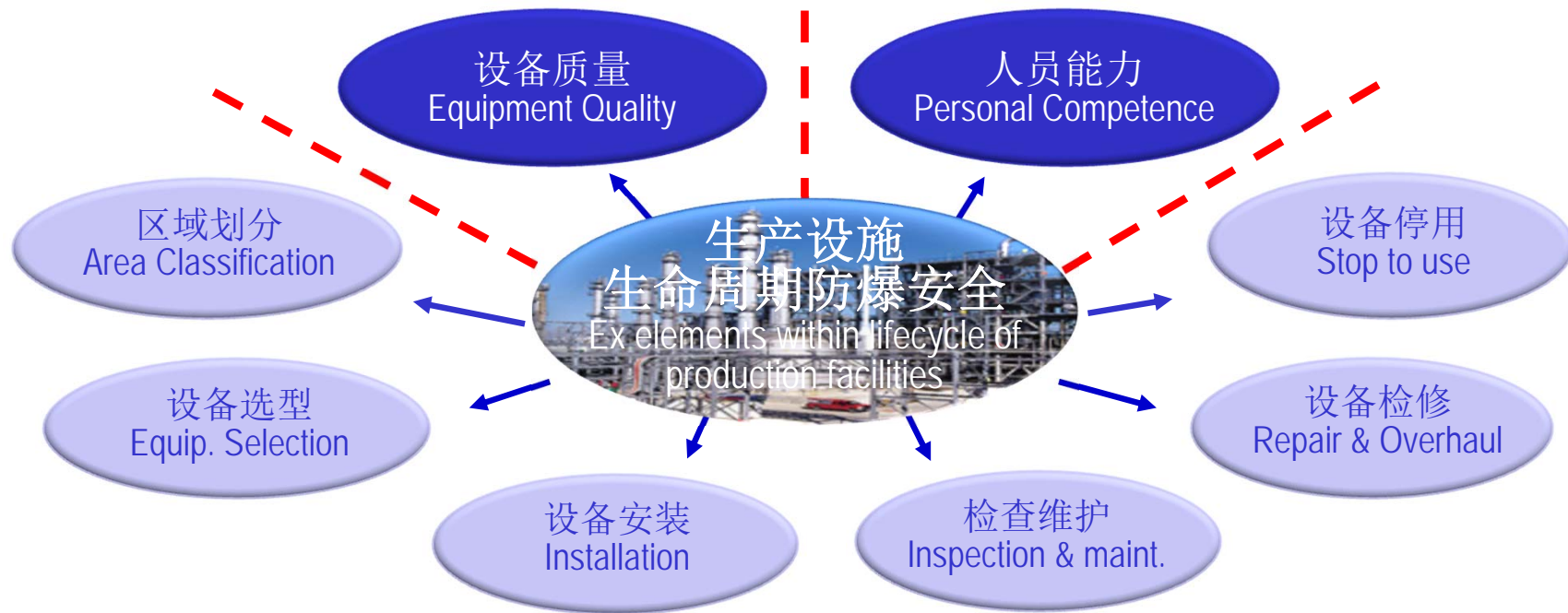


**基本要求：合格的（设备+服务+人员）**  
**Solution: using qualified equipment, service and persons**



# 防爆安全要素 key elements for Ex safety

合格设备 + 合格服务 + 合格人员 = 整体防爆安全  
Qualified (equipment + services + persons) = Entity Explosion Protection



- 为此，中国从标准化入手持续完善并构建包括技术标准、监管体系、产品市场准入、使用监督和人员管理相关的防爆安全基础体系。China continues to strengthen the construction of Ex infrastructure, including **standardization**, regulatory system, product market access and usage monitoring and key operational personnel management and etc.



# 中国标准化历史 China Ex standardization history

- 上世纪30年代开始涉及煤矿防爆安全技术研究。 - China began its R&D of Ex technologies for safety of mining in 1930's.
- 60年代初仅有少量防爆产品可供煤矿使用。 - It was not until 1960's that limited kinds of Ex apparatus were available.
- 1957年加入IEC组织，并于70年代初成为IECTC31的积极成员。 - China participated in IEC in 1957, and being as an active member of IEC TC31 in 1970's.
- 1977年中国第一部防爆标准GB1336《防爆电气设备制造检验规程》颁布。 - In 1977, the first standard GB 1336 "Regulation of manufacturing and testing of electrical apparatus for explosive atmospheres" was officially published.
- 1983年，成立全国防爆电气设备标准化技术委员会，并于同年颁布了GB3836.1~4系列标准。 - In 1983, a national committee on explosion protection was established, and GB3836 series standards, including general requirements, Exd, Exe and Exi were issued in the same year.
- 持续倡导国家标准化原则：优先采用国际或区域标准。 - Continue to advocate the principle of National Standardization: priority to adopt int'l and regional standards.





# 标准化成果 Standardization achievements

- 得益于IEC等国际标准化的贡献，中国建立了覆盖气体和粉尘防爆、电气和非电气设备，可满足设备全生命周期防爆安全技术标准体系，包括：  
Thanks to the contributions of IEC Standardization, China has developed its own series national technical standards covering whole lifecycle Ex safety requirements for electrical and non-electrical equipment for explosive gas and dust , includes:
  - **基础标准**（如，MESG、MIC、AIT试验方法、物质分类等） – Fundamental standards, e.g., MESG, MIC, AIT test methods, and hazardous material classification
  - **制造标准**（如，各类防爆技术标准或具体产品防爆标准） Manufacturing standards, e.g., various protection types and specific products
  - **应用标准**（如，场所分类、装置设计、设备选型、安装、检查、维护、修理标准等） – Application standards, e.g., area classification, design, selection, installation, inspection, maintenance & repair





# 中国防爆标准体系 Ex standard systems in China

**GB 25285 series: Basic concepts & methodology (I, II) 基本概念和方法**

**GB 12476 series for dust 粉尘**

- DIP A/B(tD) 外壳保护型
- iD 本质安全型
- mD 浇封型
- pD 正压型

**GB 3836 series for gas 气体**

- General 通用要求
- Ex d 隔爆型
- Ex e 增安型
- Ex i 本质安全型
- Ex p 正压型
- Ex o 充油型
- Ex q 充砂型
- Ex n 型
- Ex m 浇封型
- IS system 本安系统
- FISCO
- EPL Ga



包括including:

- 气体和粉尘  
Gas & dust
- 电气和非电气  
Electrical & non-electrical

**GB 25286 series for non-electrical 非电气系列标准:**

- General 通用要求
- Ex fr 限制流速型
- Ex d 隔爆型
- Ex c 结构安全型
- Ex b 控制点燃源型
- Ex k 浸没型



# 接受的防爆技术 Ex concepts accepted in China

- 依据中国防爆技术标准体系，中国接受的主要防爆型式有： - According to the published technical standard systems, the following Ex concepts were accepted in China:
  - 爆炸性气体环境 For explosive gas
    - 1. 隔爆型 flameproof Ex d
    - 2. 本安型 intrinsic safety Ex ia/ib/ic
    - 3. 增安型 increased safety Ex e
    - 4. 正压型 pressurization Ex px/py/pz
    - 5. 充油型 oil immersion Ex o
    - 6. 充砂型 powder filling Ex q
    - 7. “n”型 non-sparking Ex nA,nC,nL,nR,nZ
    - 8. 浇封型 encapsulation Ex ma, mb, mc
    - .....
  - 爆炸性粉尘环境 for combustible dust
    - 1. 外壳保护型 by enclosure DIP A/B (tD)
    - 2. 本安型 by intrinsic safety iaD/ibD
    - 3. 浇封型 by encapsulation maD/mbD
    - 4. 正压型 by pressurization pD
- ☞ 此外，还有非电气设备防爆技术，如Ex fr, d, c, b, k。 - In addition, China accepts all the concepts for non-electrical equipment, e.g. Ex fr, d, c, b, k.





# 系列防爆标准举例 Examples of series Ex standards

■ GB 3836 爆炸性气体环境系列标准举例 - Examples of GB 3836 series standards for Gas

中国GB标准 China GB standards	标准名称 Standard Name/Subject	采用国际标准情况 Adoption of int'l standards
GB 3836.1-2010	General requirements	mod IEC 60079-0:2007
GB 3836.2-2010	Flameproof "d"	mod IEC 60079-1:2007
GB 3836.3-2010	Increased safety "e"	idt IEC 60079-7:2006
GB 3836.4-2010	Intrinsic safety "i"	mod IEC 60079-11:2006
GB 3836.5-2004	Pressurization "p"	mod IEC 60079-2:2001
GB 3836.6-2004	Oil immersion "o"	idt IEC 60079-6:1995
GB 3836.7-2004	Powder filling "q"	idt IEC 60079-5:1997
GB 3836.8-2003	Non-sparking "n"	mod IEC 60079-15:2001
GB 3836.9-2006	Encapsulation "m"	idt IEC 60079-18:2004
GB 3836.18-2010	Intrinsically safe system	idt IEC 60079-25:2003
GB 3836.19-2010	FISCO	idt IEC 60079-27:2008
GB 3836.20-2010	EPL Ga	idt IEC 60079-26:2006



# 系列防爆标准举例 Examples of Ex standards (con't)

## ■ GB 12476爆炸性粉尘环境系列标准举例 - Examples of GB 12476 series standards for Dust

中国GB标准 China GB standards	标准名称 Standard Name/Subject	采用国际标准情况 Adoption of int'l standards
GB 12476.1-2013	General requirements	mod IEC 61241-0:2004
GB 12476.4-2010	Protection by intrinsic safety "iD"	idt IEC 61241-11:2005
GB 12476.5-2013	Protection by enclosure "tD"	idt IEC 61241-1:2004
GB 12476.6-2010	Protection by encapsulation "mD"	idt IEC 61241-18:2004
GB 12476.7-2010	Protection by pressurization "pD"	idt IEC 61241-4:2001

## ■ GB 25286非电气设备系列标准 - Examples of GB 25286 series standards for Non-Electrical

中国GB标准 China GB standards	标准名称 Standard Name/Subject	采用国际标准情况 Adoption of int'l standards
GB 25286.1-2010	Basic method and requirements	mod EN 13463-1:2001
GB 25286.2-2010	Protection by flow restricting enclosure "fr"	mod EN 13463-2:2004
GB 25286.3-2010	Protection by flameproof enclosure "d"	mod EN 13463-3:2005
GB 25286.5-2010	Protection by constructional safety "c"	mod EN 13463-5:2003
GB 25286.6-2010	Protection by control of ignition source "b"	mod EN 13463-6:2003
GB 25286.8-2010	Protection by liquid immersion "k"	mod EN 13463-8:2003



# 系列防爆标准举例 Examples of Ex standards (con't)

此外，中国还颁布了以下标准： In addition, following standards also available in China:

- 电气产品标准： Standards for electrical products:
  - 可燃气体系列标准 gas detectors (GB 20936/IEC 61779)
  - 伴热带 heating trace (GB 19518/IEC 62086)
  - 加油机 gasoline dispenser (GB 22380/EN 13617)
  - 安全帽灯 caplights (GB 7957/IEC 62013)
  - 往复式内燃机 reciprocating internal combustion engines (GB 20800/EN 1834)
  - 工业叉车 Industries truck (GB 19854/EN 1755), .....
- 基础应用标准 Standards for fundamentals and application of Ex equipment:
  - 基础标准, fundamental (MESG, AIT, MIE), area classification, selection, installation, inspection, maintenance, overhaul and repair
  - 工程设计、验收规范 Rules and/or regulations on design and acceptance of Ex engineering projects

[共计60余项防爆相关标准和规范 [about 60 Ex standards/regulations in total](#)]





# 标准差异 Deviations from IEC/EN standards

- 总体而言，大多数中国现行防爆标准在技术内容上是与IEC和EN标准等同或等效，但采用的版本稍迟后于IEC/EN现行版本。 In general, majority of the current CN Ex standards are idt. or eqv. to IEC/EN standards, but the edition of CN standards later than the current edition of IEC/EN's.
- 详细的标准差异可通过IECEX网站查阅IECEX公报。 Detailed deviations from IEC standards available in IECEx Bulletin at IECEx website.
- 例如 Example - GB3836.1-2010 vs IEC 60079:2007:
  - 附录C增加I类电气设备的特殊要求 Annex C supplement additional requirement for group I;
  - 增加I类手持式或支架式电钻、携带式仪器仪表和灯具外壳的要求 Supplement requirements for enclosure of group I electrical drill, portable instr. & luminaire;
  - 增加对金属制I类设备接线腔内表面涂漆要求 Supplement requirements for the internal painting of group I metallic enclosure
  - 对开关、熔断器和灯具补充规定中增设“警告标志”的相关条款不适用于I类设备的规定 The warning for switch, fuse and luminaire is not applicable for group I equipment;
  - 规定了“耐热试验”和“耐寒试验”间的时间间隔 Specify the interval between thermal endurance to heat and to cold;
  - 增加有关防爆取证程序的附录 D Annex D describe the procedure for certification of Ex equipment, indicating .....
- 值得一提的是所有的防爆基本概念与IEC和EN标准完全相同。 It is worth mentioning that the Ex fundamentals on grouping, classification of materials, hazardous location and Ex equipment, as well as the Ex marking and equipment selection are same as those in IEC and European standards.



# 一致的基础概念 Coincident fundamentals

## ■ 爆炸性物质分类、分级 Grouping / Sub-grouping of gas and dust

中国、IEC、欧洲 China / IEC / EN		典型气体 Representative gas/dust	北美国家 North America	
Group I mine methane I类 - 煤矿甲烷	-	甲烷 Methane	D	Class I (gas)
	Group II explosive gas II类 - 爆炸性气体	IIA		
IIB		乙烯 Ethylene	C	
IIC		氢气 Hydrogen	B	
	乙炔 Acetylene	A		
Group III dust & fiber III类 - 粉尘和纤维	IIIA	可燃性纤维 Combustible Fibers	-	Class III (fiber)
	IIIB	非导电粉尘 non-conductive dust	G (粮食粉尘) F (炭粉) E (金属粉尘)	Class II (dust)
	IIIC	导电粉尘 Conductive dust		

☞ 对于气体，基于最大试验安全间隙和最小点燃电流比分级 Gas grouping is based on the MESG and MICR of materials

☞ 对于粉尘/纤维，基于物质可燃性、导电性、尺寸等特性分级 Dust grouping is based on materials' combustibility, size, conductivity and etc.



# 一致的基础概念 Coincident fundamentals (con't)

- 爆炸性物质分组(T Classes): 基于爆炸性气体/粉尘最小引燃温度。  
Temperature classes: Based on MIT of explosive gas / dust

中国、IEC、EN China / IEC / EN	引燃温度, AIT °C	北美国家 North America	引燃温度, AIT °C
T1	$t > 450$	T1	$t > 450$
T2	$300 < t \leq 450$	T2	$300 < t \leq 450$
-	-	T2A	$280 < t \leq 300$
-	-	T2B	$260 < t \leq 280$
-	-	T2C	$230 < t \leq 260$
-	-	T2D	$215 < t \leq 230$
T3	$200 < t \leq 300$	T3	$200 < t \leq 215$
-	-	T3A	$180 < t \leq 200$
-	-	T3B	$165 < t \leq 180$
-	-	T3C	$160 < t \leq 165$
T4	$135 < t \leq 200$	T4	$135 < t \leq 160$
-	-	T4A	$120 < t \leq 135$
T5	$100 < t \leq 135$	T5	$100 < t \leq 120$
T6	$85 < t \leq 100$	T6	$85 < t \leq 100$



# 一致的基础概念 Coincident fundamentals (con't)

- 区域划分：基于爆炸性物质出现的频繁程度和持续时间。  
Area classification: Based on duration and probability of occurrence of explosive substances

危险区域定义 Hazloc definition	中国/IEC/EN标准- Zone		北美标准-Division		危险程度 Degree of Hazard
	气体 gas	粉尘 dust	气体 gas	粉尘dust	
正常情况连续出现 Continuous Hazard	0	20	Division 1		高high
正常情况间断出现 Intermittent Hazard	1	21			中middle
仅在异常时出现 Hazard under abnormal conditions	2	22	Division 2		低low

- GB50058 爆炸危险环境电力装置设计规范 Electrical installations design code for explosive atmospheres
- GB3836.14 (idt)爆炸性气体环境用电气设备 第14部分 危险场所分类 Electrical apparatus for explosive gas atmospheres – Part 14: Classification of hazardous area
- GB12476.3(idt)可燃性粉尘环境用电气设备 第3部分 存在或可能存在可燃性粉尘的场所分类 Electrical apparatus for use in the presence of combustible dust- Part 3: Classification of areas where combustible dusts are or may be present





# 一致的基础概念 Coincident fundamentals (con't)

- 设备分类分级分组 grouping and classification of Ex equipment

中国/EN/IEC标准 – China/EN/IEC standards				适用区域 Applied Zones	欧洲 EU Cat.
设备分类 (Group)	设备分级 (Sub-grouping)	设备分组 T-class	设备保护级别 (EPL)		
I类 - 矿井用 (Mining)	---	---	Ma - 很高 Mb - 高	---	M1 M2
II类 - 工厂用 (Gas)	IIA、IIB、IIC	T1~T6	Ga - 很高 Gb - 高 Gc - 增强	0 1 2	1G 2G 3G
III类 粉尘或纤维环境用 (Dust)	IIIA、IIIB、IIIC	T1~T6	Da - 很高 Db - 高 Dc - 增强	20 21 22	1D 2D 3D



# 一致的基础概念 Coincident fundamentals (con't)

## ■ 设备选型 Selection of Ex equipment (如, 气体环境用设备 - Examples for gas)

防爆型式 Type of Protection	防爆型式符号 Ex Symbol	允许使用的区域 Applied zone
本质安全型 – Intrinsically safe ‘ia’ 浇封型 – Encapsulation ‘ma’ 为0区设计的特殊型 – special type for Zone 0	Ex ia Ex ma Ex sa	0区 - Zone 0
适合于0区的防爆型式 – all types for Zone 0 隔爆型 – Flameproof 本质安全型 - Intrinsically safe ‘ib’ 增安型 – Increased safety (Note 1) 正压型 – Pressurization 油浸型 – Oil immersion 充砂型 – Powder filling 浇封型 – Encapsulation ‘mb’ 为1区设计的特殊型 – special type for Zone 1	Ex d Ex ib Ex e Ex px, Ex py Ex o Ex q Ex mb Ex sb	1区 - Zone 1
适合于0、1区的防爆型式 – all types for Zone 0 & 1 “n”型 – non-sparking 正压型 – Pressurization 本质安全型 - Intrinsically safe ‘ic’ 浇封型 – Encapsulation ‘mc’ 为1区设计的特殊型 – special type for Zone 1	Ex nA,nC,nR,nL Ex pz Ex ic Ex mc Ex sc	2区 - Zone 2

**Note 1:** 并非所有的Exe产品可用于1区。 - Not all the Exe equip. are permitted in Zone 1 in China.

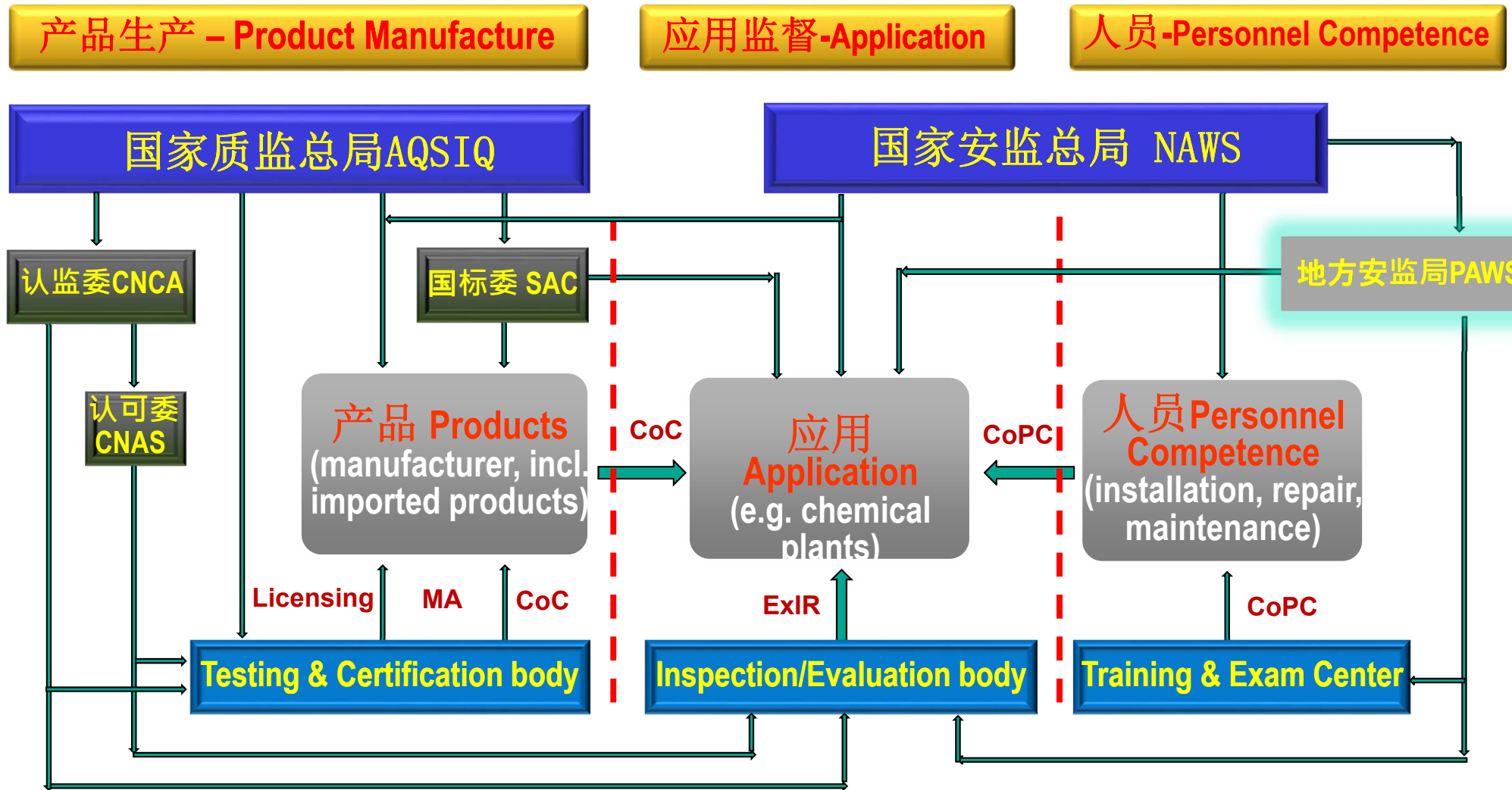


# 监督管理体系 Ex regulatory management systems

- 总体而言，中国依据国际惯例，对防爆安全实行强制监督管理。 - Generally, as int'l practice China implements mandatory supervision and management to Explosion Protection.
- 中国人民共和国标准化法/中华人民共和国标准化法实施条例（标准、产品）  
Standardization Law of PRC, Regulations for the implementation of standardization Law of PRC
  - 将国家技术标准分为强制 (GB)、推荐 (GB/T)、指导 (GB/Z) 三种。中国防爆标准 GB3836/12476/25285 为强制性标准。 - China's technical standards are divided as compulsory, recommendatory and instructional. All the Ex standards are compulsory.
  - 强制性标准必须执行。不符合强制性标准的产品，禁止生产、销售和进口。 - As specified by the law, compulsory standards must be complied with, and it is forbidden to produce, sell or import products that are not up to the compulsory standards.
- 中华人民共和国产品质量法 Product Quality Law of PRC
  - 可能危及人身、财产安全的工业产品，须符合相关国家强制性标准。 - Industrial products relating to the safety of person and property must comply with national mandatory standards.
- 中华人民共和国安全生产法 Production Safety Law of PRC（应用监督、人员管理）
  - 安全设备(产品)的设计制造、安装、使用、检测、维修和改造，应当符合国家标准。 - The design, manufacture, installation, usage, maintenance and rebuild of safety equipments/ products should comply with national standards.
  - 特种作业人员须持证上岗。 - Special operation person must hold personnel competence certificate (PCP)



# 组织管理体系 Organization management systems



- **AQSIQ:** General Administration of Quality supervision Inspection and Quarantine of PRC
- **CNCA:** Certification and Accreditation Administration of PRC
- **SAC:** Standardization Administration of PRC

- **CNAS:** China National Accreditation Services for CA
- **NAWS:** National Administration of Work Safety



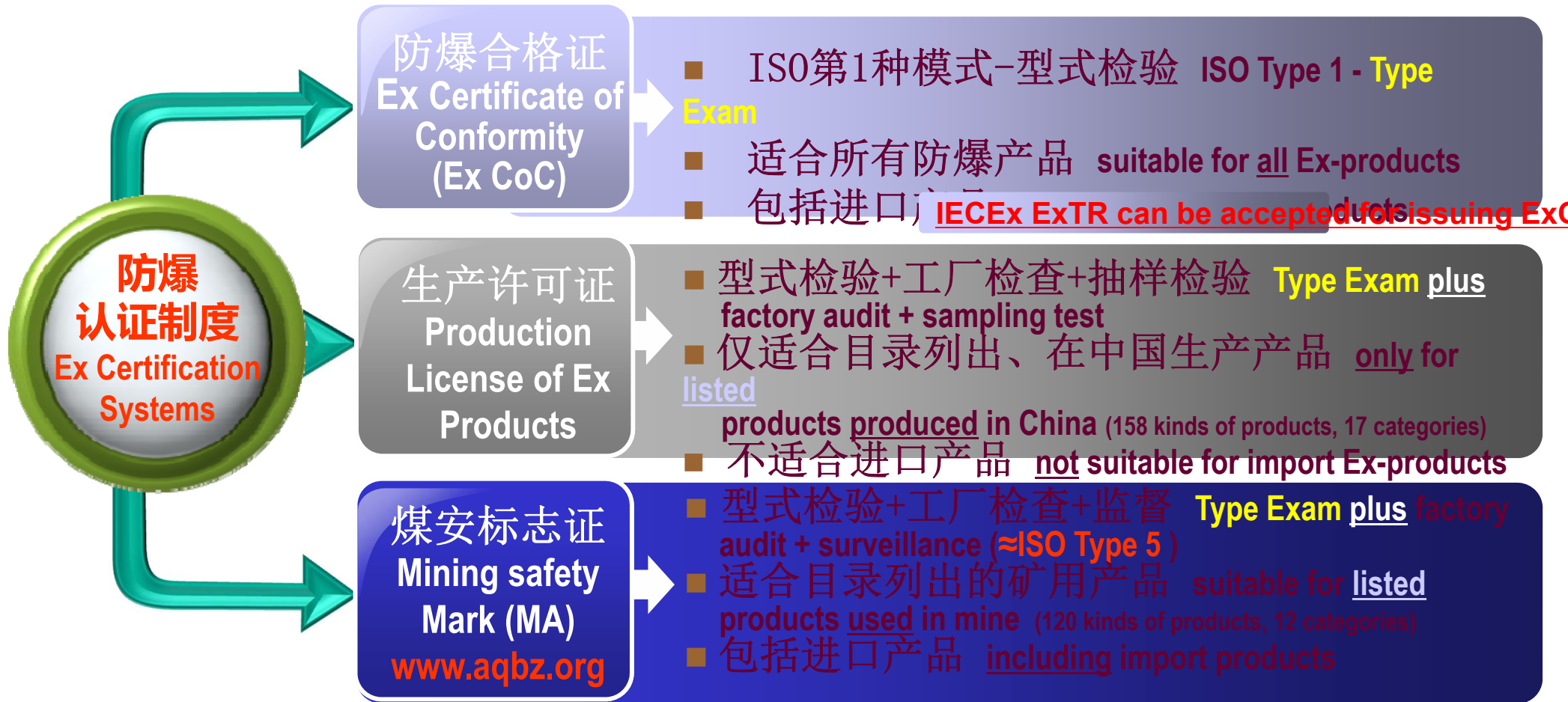


# 对产品要求 Requirements for Ex products

- GB3836.1-2010 爆炸性环境 第1部分：设备 通用要求（附录D） - Explosive atmospheres – Part 1: Equipment – General requirements (Annex D)
- GB12476.1-2013 可燃性粉尘环境用电气设备 第1部分：通用要求（附录A） - Electrical apparatus for use in presence of combustible dust - Part 1: General requirements (Annex A)
- GB25286.1-2010 爆炸性环境用非电气设备 第1部分 基本方法和要求（附录E） - Non-electrical equipment for explosive atmospheres – Part 1: Basic method and requirements (Annex E)
  - 👉 程序规定：所有防爆产品必须取得国家授权检验机构的检验并取得防爆合格证 (Ex CoC)。 - all Ex products must be certificated by the state authorized testing and certification organizations for obtaining Ex Certificate of Conformity, ExCoC.
- 《中华人民共和国工业产品生产许可证管理条例》及其实施规则 - The Regulation on administration of production licensing of industrial products and its implementation rules
  - 👉 相应目录列出的防爆产品须取得生产许可证。 - The Ex products listed in the Catalogue must obtain the Production License
- 《煤矿安全监察条例》《煤矿矿用产品安全标志管理暂行办法》 - Supervision Regulation on coal mine safety and the Regulation on administration of coal mine safety mark
  - 👉 目录列出的防爆产品须取得煤安标志认证。 - The Ex products listed in the Catalogue must obtain the MA certificate



# 防爆产品认证制度 Ex-product Certification Systems



☞ 持证防爆产品按《产品质量法》可能周期性被监督抽查 - certified and licensed Ex product may be subject to periodical supervision and spot checks according to the Law on product quality.



# 产品认证过程 Certification Processes of Ex products

## 产品认证过程 Certification Processes

### Ex Certificate of Conformity

#### PROCESSES

- App & contract (eg. NEPSI)
- Documentation review
- Sample check and type testing
- Issuing ExTR and ExCoC

Notes: 1. without factory audit  
2. CoC valid for 5 years

#### APPLICATION DOCUMENTS

- detailed list of all products
- technical description on Ex
- Ex related key drawings;
- instruction manual
- previous cert. documents
- copy of ISO9001 or QAR

### 防爆合格证

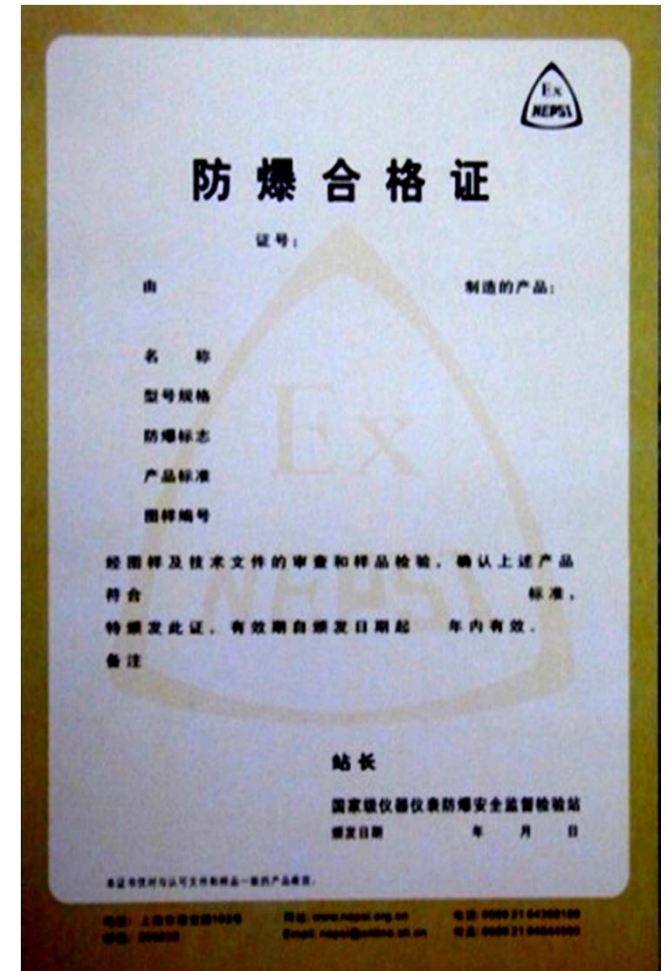
#### 流 程

- 申请和签约 (eg. NEPSI)
- 文件审查
- 样机检查和型式试验
- 签发试验报告和证书

注: 1. 没有工厂检查  
2. 证书有效期5年

#### 申请文件

- 申请产品清单 (含标志)
- 防爆技术描述文件
- 防爆相关的关键图纸
- 产品说明书
- 如有, 先前的认证文件
- ISO9001证书或QAR复印件







# 产品认证过程 Certification Processes of Ex products (con't)

## 产品认证过程 Certification Processes

### Production License of Ex Products

#### PROCESSES

- Application to local gov. office
- Doc. review and acceptance
- site audit & sampling organized by assessment office
- sample test & reporting by ExTL
- summarizing doc for approval
- Issuing license by AQSIQ office

Notes: license valid for 5 years

#### APPLICATION DOCUMENTS

- completed application form
- business license
- copy of Ex CoC
- copy of license when relevant
- necessary explanation

### 防爆产品生产许可证

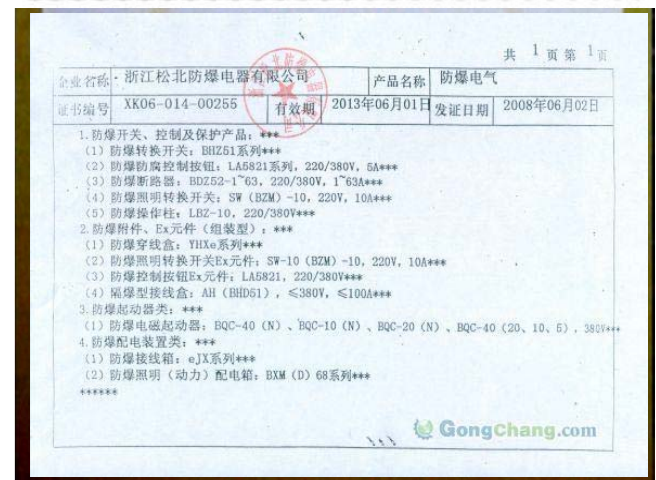
#### 流 程

- 向地方许可证办提交申请
- 文件初审核受理
- 审查部组织现场评审核抽样
- 抽样试验并出具报告
- 审查部汇总文件
- 全许办颁发许可证

注: 许可证有效期5年

#### 申请文件

- 完整的申请表
- 营业执照
- 防爆合格证书复印件
- 相关许可文件, 如有
- 必要的说明文件







# 产品认证过程 Certification Processes of Ex products (con't)

## 产品认证过程 Certification Processes

### Mining Safety Mark (MA)

#### PROCESSES

- App. & contract (MA center)
- Tech. review, type test by ExTL
- site assessment –not for batch
- final document review
- Issuing MA certificate, or with series numbers for batch

Notes: Certificate valid for 5 years

#### APPLICATION DOCUMENTS

- completed application form
- business license
- tech. description to product
- all technical documents
- self-assessment report on production resources, compliance to standards
- necessary explanation (series)

### 煤安标志认证 (MA)

#### 流 程

- 申请和签约 (安标中心)
- 实验室技术审查和型式试验
- 现场评审 (批检无此项)
- 文件终审
- 签发安标证书

注: 证书有效期5年

#### 申请文件

- 完整的申请表
- 营业执照
- 产品技术描述文件
- 全部技术文件
- 生产能力和标准符合性自评报告
- 必要的说明文件 (如, 系列规格说明)





# 与其它制度关系 Relationship with other cert. systems

## ■ 计量器具型式批准(含进口) China Pattern Approval (CPA) for Measuring Devices (including imported), used for trade settlement , safety protection and etc.



– 由质量管理部门（进口产品由国家质监总局）组织实施  
o operated by quality administration department, but for imported measuring devices operated by AQSIQ (<http://jls.aqsiq.gov.cn/>)

– 依据中华人民共和国计量法和进口计量器具管理办法等，计量器具须按计量检定规范（JJG）由授权的型式评价机构进行型式试验。 mandated by the Metrology Law of China, and management regulation on imported measuring devices, a type test to national metrological verification regulation (JJG) required by authorized organization.

– 目录列出了75类220种计量器具。 75 categories 220 kinds of measuring devices, e.g, level meter, flow meter, load scale/cell, dispenser, pressure instrument, gas detectors and etc. listed in the Catalogue.

– 所有列出的计量器具，如同时是防爆产品，除应取得防爆合格证外，尚需取得中国型式批准（CPA）证书。 for all the listed instruments, once used for hazardous locations in China, additional CPA is required with exception of Chinese Ex CoC.

– NEPSI/SITIIAS是授权的型式评价机构，可提供必要的协助NEPSI/SITIIAS is authorized organization, assistance available from





# 与其它制度关系

Relationship with other cert. systems (con't)

## 中国强制性产品认证（含进口） - China Compulsory Certification (CCC)

- 由国家质监总局和国家认监委组织实施。  
Operated by AQSIQ and CNCA ([www.CNCA.gov.cn](http://www.CNCA.gov.cn))
- 依据中华人民共和国认证认可条例和强制性产品认证管理办法等，按具体的实施规则由授权的认证机构和试验室进行检测、认证。 mandated by the Regulations on Certification and Accreditation, and Provisions on the administration of CCC, testing and certification to specific implementing rule carried out by authorized organization.
- 目录列出了22类153种产品。 22 categories 153 kinds of products listed in the Catalogue.
- 列出的CCC产品如是防爆产品，且拟进口用于爆炸危险场所的，仅须取得防爆合格证书，无需CCC认证。  
For CCC-listed products with Ex functions and imported for use in hazardous location, no need to apply for CCC certificate, only China Ex CoC is required.
- NEPSI/SITIIAS是授权的CCC试验机构，可提供必要的协助。 NEPSI/SITIIAS is authorized CCC testing laboratory, assistance available from NEPSI/SITIIAS.







# 对工程要求 Requirements for Ex Engineering projects

- GB50058-2014 爆炸危险环境电力装置设计规范 - Electrical installations design code for explosive atmospheres
- GB50257-2014 电气装置安装工程 爆炸和火灾危险环境电气装置施工及验收规范 - Code for construction and acceptance of electrical devices for explosion atmospheres and fire hazard in electrical equipment installation engineering
- GB3836.15-2000 爆炸性气体环境用电气设备 第15部分 危险场所电气安装（煤矿除外） - Electrical apparatus for explosive gas atmospheres – Part 15: Electrical installations in hazardous areas (other than mines)
- GB3836.16-2006 爆炸性气体环境用电气设备 第16部分 电气装置的检查和维护（煤矿除外） - Electrical apparatus for explosive gas atmospheres – Part 16: Inspection and maintenance of electrical installation (other than mines)
- GB3836.13-2013 爆炸性环境 第13部分：设备的修理、检修、修复和改造 Explosive atmospheres – Part 13: Equipment repair, overhaul and reclamation
- ☞ 这些规范(标准)均属强制性。 - All these regulations (standards) are compulsory.
- ☞ 要求所有防爆产品必须取得国家指定防爆检验机构的认证，并在产品上予以标识。 - Ex products must be certificated by the state authorized explosion protection inspection and certification organizations. Certification information shall be marked on the nameplate.
- ☞ 防爆工程项目设计、防爆产品选型、安装、维护和验收等应符合上述规范规定的安全要求。 - The design of Ex engineering projects and the selection, installation, maintenance and acceptance of Ex products shall satisfy the safety requirements specified in these regulations.





# 使用监督规则

## Regulatory rules for application of Ex products

### ● 防爆产品使用监督依据 Regulatory rules:

- 中华人民共和国安全生产法 Production Safety Law of PRC, 2002/201
- 安全生产许可证条例 Rules for safety production license, 2004

👉 规定：对危险化学品生产、储存和使用企业**实施安全生产许可证制度，未取得许可证禁止投产。** - A safety production license is required for the enterprises manufacturing, storing and using hazardous chemicals by rules. Without the license, it is forbidden to put into production

👉 涉及爆炸危险的工程项目，要求接受专业防爆检查机构的**防爆安全评价与验收。** - Every engineering project with explosion hazards is required to be assessed and accepted for explosion protection and safety by a state authorized inspection bodies.

### 👉 项目建立过程 - Project establishment processes

- 项目可行性研究报告 - project feasibility study report
- 规划主管部门或上级公司批复 - approve by planning department or parent company
- 安全评价报告并经评审 - Safety assessment report developed and reviewed by third party

**注1：核心是分析项目环境条件和生产工艺，辨识危险有害因素，提出安全对策措施。涉爆工**

**程项目**需包括防爆对策措施。 - The core: analyze environmental conditions and production processes; identify dangerous





# 使用监督规则 Regulation rules for app. of Ex products (con't)

## 👉 项目建立过程（续） – Project establishment processes (con't)

- 安全生产主管部门对项目设立批准 – project construction approved by safety department
- 由有资质的施工单位进行项目建设 – carry out project construction by qualified company
- 由授权机构进行安全设施验收评价 – conduct a in-site safety facilities acceptance evaluation by

**注2:** 涉爆工程项目, 要求接受专业防爆检查机构防爆安全验收评价。 - Every engineering project with Ex hazards is required to be assessed and accepted for explosion protection and safety by a state authorized inspection body (e.g., NEPSI).

**注3:** 重点验证工程项目中选用设备的适宜性、设备防爆合格证有效性、检查产品防爆符合性、核查设备安装正确性和人员能力符合性, 最终确认整个工程项目是否符合“整体防爆”。 - To verify the suitability of equipment selected, the validity of Ex CoC, check the conformity of products to standards, the correctness of installation and qualification of personnel competence. Finally, to confirm the compliance of “Entity Explosion Protection”.

- 安全生产主管部门组织项目现场专家审查会, 颁发安全生产许可证。 - in-site expert review meeting organized by safety department, and issue safety production license
- 项目正式投产; 业主按标准进行日常检查和维护 – legally put into production, and the project owner conducts daily inspection and maintenance for continuous safety
- **注4:** 涉及爆工程项目, 也要求每3年由专业防爆检查机构进行再检查。 - for Ex-related project, it is also required to be re-inspected every three years by an authorized inspection body, e.g., NEPSI.



# 对从业人员要求 Requirements for Ex personnel

- GB3836.15-2000 爆炸性气体环境用电气设备 第15部分 危险场所电气**安装**（煤矿除外） - Electrical apparatus for explosive gas atmospheres – Part 15: Electrical installations in hazardous areas (other than mines)
- GB3836.16-2006 爆炸性气体环境用电气设备 第16部分 电气装置的**检查和维护**（煤矿除外） - Electrical apparatus for explosive gas atmospheres – Part 16: Inspection and maintenance of electrical installation (other than mines)
- GB3836.13-2013 爆炸性环境 第13部分：设备的**修理**、检修、修复和改造  
Explosive atmospheres – Part 13: Equipment repair, overhaul and reclamation
- 👉 强制性标准规定：涉及安装、维护、修理等人员应具有相应的知识、能力和上岗资质，并定期接受继续教育培训。 -The installation, maintenance and repair persons should have enough Ex knowledge and skills, being qualified with periodical training.
- 《中华人民共和国安全生产法》 - Production Safety Law of PRC
- 《特种作业人员安全技术培训考核管理规定》（总局30号令） - Provisions on the administration of training and assessment of special operations personnel safety technology
- 👉 防爆设备安装、维护和修理作业是安全生产特种作业，须授权机构经培训、持证上岗。 - The installation, maintenance and repair activities are defined as special operation, the relevant persons must be trained and certified by authorized organization, holding Personnel Competence Certificate (ExPCC)
- 👉 持证人员需3年一次的复训和考试来保持证书有效性。 - Every 3 years, re-training and examination is required for maintaining the certificate.







# 防爆技术机构 Ex technical organization in China

- 中国共有14个国家认可和授权的防爆技术机构，其中7个机构加入了IECEX体系。 - There are 14 organizations serving for Ex testing and certification, accredited and authorized by Chinese government, 7 in IECEx system as ExCB or ExTL
- **NEPSI/SITIIS**是国家级检测、校准实验室和检查、认证机构，是可颁发防爆合格证书的认证机构、工程项目防爆检查机构之一。 - NEPSI/SITIIS in Shanghai, is accredited and authorized as a national testing, calibration, inspection and certification organization, one of notified organizations issuing national Ex CoC and conducting Ex inspection for engineering.
  - 有100余人，具有50多年历史 with 100 employees, 50 year history, and 31 years experience in Ex testing and certification
  - 拥有18个国际伙伴 18 mutual partners in the world
  - 业务遍及20多个国家和地区，在德国PTB设有办事处 Ex business extended to 20 countries & regions, with an business office at PTB
  - 是国家防爆人员能力培训考试机构 training and examination center
  - 也是IECEX实验室、培训机构 operating as an IECEx TL & RTP



👉 中国是IECEX体系创始国，IECEX认证可帮助产品和服务快速进入中国市场。 China is one of IECEx founding countries, IECEx certification can help Ex products & services quickly access into Chinese market!





## 结语 Conclusions

- 中国作为世界第二大经济体和最具潜力的市场，其防爆相关工业发展迅速，防爆相关的产品和服务需求将持续保持增长。 - As the world's second largest economy and the most promising marketplace, Ex industries in China grow rapidly, the demand of Ex products will be continuously increasing in next few years.
- 基于安全发展，中国建立有较为完善的防爆技术标准体系、产品认证体系、产品应用监管体系和防爆相关服务人员管理制度。 - For safe development, China has established complete Ex technical standard system, product certification system, Ex product application supervision system and qualification requirement of Ex personnel.
- 中国的防爆技术标准在技术与IEC和EN标准等同或等效。 - Chinese Ex standards are identical or equivalent to IEC and EN standards in general.
- 根据中华人民共和国标准化法，全部防爆标准为强制性标准，必须强制执行。 - All the Ex-related standards are compulsory standards, must be carried out according to standardization law of the PRC.
- 中国对防爆产品实施强制认证，在中国使用的防爆产品(含进口)必须经国家指定的防爆检验机构认证。 Cert. of Ex products is mandatory in China, all the Ex products, including imported products, used in China must be certified by an authorized Chinese testing and certification body.



## 结语 Conclusions (con't)

- 中国防爆合格证书基于ISO第一种认证模式，不必进行工厂检查。而矿用防爆产品的煤安认证基于ISO第五种认证模式。防爆产品生产许可证不适合于进口防爆产品。 - A Chinese national ExCoC is issued based on ISO Type 1, and factory audit is not necessary; but MA certification for mining products is based on Type 5. The production license of Ex products is not suitable for imported Ex products.
- 根据安全生产法，涉及生产、储存、运输和使用危险化学品的企业，其设施须每3年经国家授权的检查机构防爆检查合格，并取得安全生产许可证。 - Ex related facilities manufacturing, storing, transporting and using hazardous chemicals are required to be inspected against Ex safety every 3 years by authorized IB for receiving a Production Safety License.
- 从事防爆设备的安装、维护和修理的作业人员必须持有防爆电气作业操作证。 - People serving for installation, maintenance and repair on Ex equipment need to hold Chinese Ex CoPC Certificate (PCC) based on training and examination.
- 作为中国防爆技术机构之一，NEPSI在防爆领域具有“一站式”综合服务能力。 - As one of Chinese leading Ex organization, NEPSI can provide one-stop shopping services incl. Ex testing, certification, inspection, as well as Ex personnel training, examination, qualification.
- 中国是IECE<sub>x</sub>积极成员，IECE<sub>x</sub>认证可帮助防爆产品快速进入中国市场。 - As an active member of IECEx, IECEx can assist Ex-products quick access into Chinese market.



UNITED NATIONS  
ECONOMIC COMMISSION FOR EUROPE

2017 IECEX International Conference  
Shanghai, China 11 - 12 April 2017

2017 IECEX 国际研讨会

谢 谢!

**Many thanks for your attention!**

*For further information, please visit:*

[www.nepsi.org.cn](http://www.nepsi.org.cn) or [www.sitias.com.cn](http://www.sitias.com.cn)