

验证报告

编号: SZXEC25001163002

日期: 2025 年 04 月 18 日

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客户名称: 深圳博柯安电机有限公司

客户地址: 深圳市光明区公明街道李松荫社区第二工业区域德轩科技园 C 栋厂房 301, 401

样品名称: 步进电机

测试基本型号: BKA30

以上样品及信息由客户提供。

SGS 工作编号: SZP25-016816

样品接收时间: 2025 年 04 月 09 日

验证周期: 2025 年 04 月 09 日 ~ 2025 年 04 月 18 日

验证要求: 参考欧盟 RoHS 指令 2011/65/EU 的修正指令(EU) 2015/863。

验证方法: 见后续页。

验证程序和结果: 见后续页。

检测结果总结:

检测项目	结论
欧盟 RoHS 指令 2011/65/EU 附录 II 的修正指令(EU) 2015/863-铅、汞、镉、六价铬、多溴联苯 (PBB)、多溴二苯醚 (PBDE)、邻苯二甲酸二(2-乙基己基)酯 (DEHP)、邻苯二甲酸丁苄酯 (BBP)、邻苯二甲酸二丁酯 (DBP)和邻苯二甲酸二异丁酯 (DIBP)	符合

通标标准技术服务有限公司深圳分公司
授权签名

石常福

Ford Shi 石常福
批准签署人

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样品照片



验证方法:

1. 参考 IEC 62321-2:2021, 拆分申请者提供的成品。
2. 参考 IEC 62321-1:2013, 仅对本报告照片中标识的样品进行了下列测试分析。
 - (1) 参考 IEC 62321-3-1: 2013, 用能量色散型 X 射线荧光分析仪器进行筛选。
 - (2) 湿法化学检测方法: 参考 IEC 62321-4:2013+A1:2017, IEC 62321-5:2013, IEC 62321-7-1:2015, IEC 62321-7-2:2017, IEC 62321-12:2023, IEC 62321-6:2015 和 IEC 62321-8:2017, 采用 ICP-OES, UV-Vis 和 GC-MS 进行分析。



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验证部件外观描述：

样品序号	样品编号	SGS 样品 ID	样品描述
SN1	A1	SZX25-0011630-0001.C001	黑色塑胶壳
SN2	A2	SZX25-0011630-0001.C002	暗银色金属螺丝
SN3	A3	SZX25-0011630-0001.C003	银色金属轴
SN4	A4	SZX25-0011630-0001.C004	黑色塑胶壳
SN5	A5	SZX25-0011630-0001.C005	银色金属片
SN6	A6	SZX25-0011630-0001.C006	白色塑胶齿轮
SN7	A7	SZX25-0011630-0001.C007	白色透明塑胶齿轮
SN8	A8	SZX25-0011630-0001.C008	白色塑胶齿轮
SN9	A9	SZX25-0011630-0001.C009	银色金属轴
SN10	A10	SZX25-0011630-0001.C010	铜色金属件
SN11	A11	SZX25-0011630-0001.C011	银色金属针脚
SN12	A12	SZX25-0011630-0001.C012	银色金属件
SN13	A13	SZX25-0011630-0001.C013	白色塑胶件
SN14	A14	SZX25-0011630-0001.C014	铜色漆包线
SN15	A15	SZX25-0011630-0001.C015	黑色塑胶件
SN16	A16	SZX25-0011630-0001.C016	银色磁铁



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验证结果:

根据物料风险评估的结果, 验证送测样品中的以下材料。(除特别标注, 单位均为: mg/kg)

检测项目	A1	A2	A3	A4	A5	A6	A7	A8
Pb	BL	BL	BL	BL	BL	BL	BL	BL
Hg	BL	BL	BL	BL	BL	BL	BL	BL
Cd	BL	BL	BL	BL	BL	BL	BL	BL
Cr(VI)▼	BL	BL	ND	BL	BL	BL	BL	BL
PBB	BL	---	---	BL	---	BL	BL	BL
PBDE	BL	---	---	BL	---	BL	BL	BL
DEHP	BL	---	---	BL	---	BL	BL	BL
BBP	BL	---	---	BL	---	BL	BL	BL
DBP	BL	---	---	BL	---	BL	BL	BL
DIBP	BL	---	---	BL	---	BL	BL	BL
结论	符合	符合	符合	符合	符合	符合	符合	符合

检测项目	A9	A10	A11	A12	A13	A14	A15	A16
Pb	BL	BL	BL	BL	BL	BL	BL	BL
Hg	BL	BL	BL	BL	BL	BL	BL	BL
Cd	BL	BL	BL	BL	BL	BL	BL	BL
Cr(VI)▼	ND	BL	BL	BL	BL	BL	BL	BL
PBB	---	---	---	---	BL	BL	BL	BL
PBDE	---	---	---	---	BL	BL	BL	BL
DEHP	---	---	---	---	BL	BL	BL	BL
BBP	---	---	---	---	BL	BL	BL	BL
DBP	---	---	---	---	BL	BL	BL	BL
DIBP	---	---	---	---	BL	BL	BL	BL
结论	符合	符合	符合	符合	符合	符合	符合	符合

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备注:

(1) X 射线荧光光谱法(XRF)筛选结果说明:

(a) 下表为 IEC62321-3-1: 2013 附录 A 不同基体材料中以 mg/kg 表示的筛选元素限值:

元素	聚合物	金属	复合材料
Cd	$BL \leq (70-3\sigma) < X < (130+3\sigma) \leq OL$	$BL \leq (70-3\sigma) < X < (130+3\sigma) \leq OL$	$LOD < X < (150+3\sigma) \leq OL$
Pb	$BL \leq (700-3\sigma) < X < (1300+3\sigma) \leq OL$	$BL \leq (700-3\sigma) < X < (1300+3\sigma) \leq OL$	$BL \leq (500-3\sigma) < X < (1500+3\sigma) \leq OL$
Hg	$BL \leq (700-3\sigma) < X < (1300+3\sigma) \leq OL$	$BL \leq (700-3\sigma) < X < (1300+3\sigma) \leq OL$	$BL \leq (500-3\sigma) < X < (1500+3\sigma) \leq OL$
Br	$BL \leq (300-3\sigma) < X$	不适用	$BL \leq (250-3\sigma) < X$
Cr	$BL \leq (700-3\sigma) < X$	$BL \leq (700-3\sigma) < X$	$BL \leq (500-3\sigma) < X$

(b) 现行法规限制的最大允许值是对 PBB/PBDE 和 Cr(VI) 而不是对 Br 和 Cr 的, 而 XRF 测定的是 Br 和 Cr。如果元素 Br 和或 Cr 的定量结果均高于限值(Br 计算基于在常见物质中 PBB/PBDE 的组成的理论计算), 则样品的筛选结果为“不确定”。

(c) EDXRF 的结果用于初步筛选, LOD=检出限, BL=低于限值, OL=超出限值, IN (符号“X”标记的区域)=不确定, 需要进一步研究, 我们建议客户用更精确的化学检测方法测试样品, 如用 ICP-OES 测定 Cd/Pb/Hg; 用 UV-Vis 测定 Cr(VI); 用 GC-MS 测定 PBB/PBDE。

(d) 对于复合材料, EDXRF 筛选测定元素所得数据可能与样品中实际含量不同。

(2) 邻苯二甲酸酯(PHTH)先进行筛分检测以确认样品是否符合限值要求, 符合则以“BL”表示, 若不符合则采用更精确的 GC-MS 化学检测方法测试样品。

检测项目	CAS No.
邻苯二甲酸二(2-乙基己基)酯 (DEHP)	117-81-7
邻苯二甲酸丁苄酯 (BBP)	85-68-7
邻苯二甲酸二丁酯 (DBP)	84-74-2
邻苯二甲酸二异丁酯 (DIBP)	84-69-5

(3) 化学检测方法结果说明:

(a) mg/kg = 0.0001%, MDL=方法检出限, ND =未检出(低于 MDL), --- =不适用。

(b) 化学检测方法的表达单位和方法检出限

检测项目	Pb	Hg	Cd	DEHP	BBP	DBP	DIBP
单位	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
方法检出限	10	10	10	100	100	100	100

任何一种 PBB 和 PBDE 的方法检出限是 100 mg/kg;

聚合物, 复合材料和皮革样品中 Cr(VI)的方法检出限是 10 mg/kg。

金属样品中 Cr(VI)的方法检出限是 0.10 $\mu\text{g}/\text{cm}^2$ 。

(c) ▼ = 金属样品中

a. 当六价格的浓度高于 0.13 $\mu\text{g}/\text{cm}^2$ 时, 样品为阳性, 即含有六价格;b. 当六价格的浓度为 ND(低于 0.10 $\mu\text{g}/\text{cm}^2$)时, 样品为阴性, 即未检测到六价格;c. 当六价格的浓度介于 0.10 $\mu\text{g}/\text{cm}^2$ 与 0.13 $\mu\text{g}/\text{cm}^2$ 之间时, 无法直接判定是否检测到六价格, 因不同个体的样品表面差异可能会影响测定结果;

由于未获知样品的存储条件和生产日期, 样品的六价格检测结果仅能代表检测时样品含六价格的状态。

(4) RoHS 指令中限制物质及均质材料中最大允许浓度值: Cd: 0.01%, Pb/Hg/Cr(VI)/PBB/PBDE/ DEHP /BBP/DBP/DIBP: 0.1%, 限值引用自 RoHS 指令(EU) 2015/863。



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(5) IEC 62321 系列等同于 EN 62321 系列。

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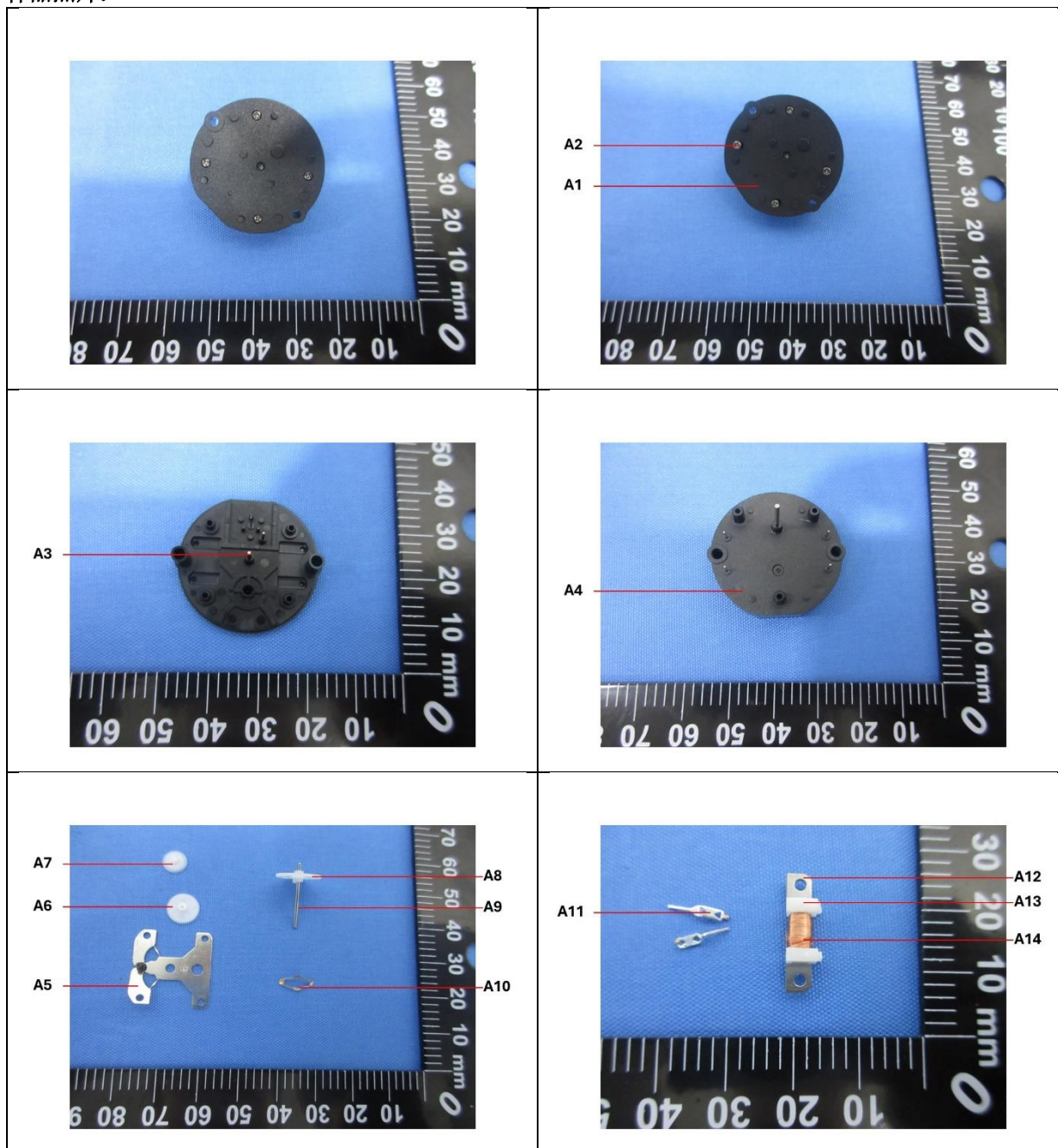
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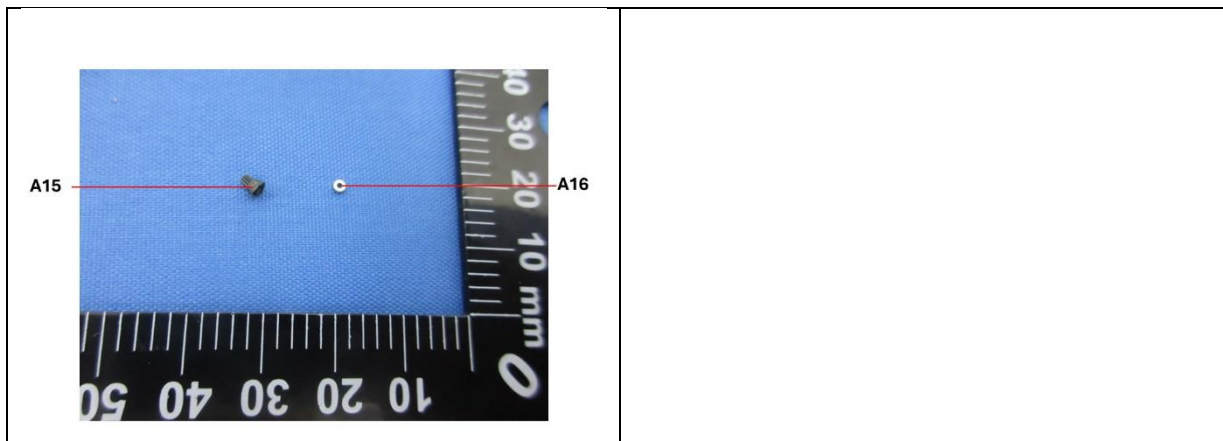
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