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人形机器人 组装及部分部件 用胶解决方案

胶粘剂与密封胶专业制造商

Professional manufacturer of adhesives and sealants

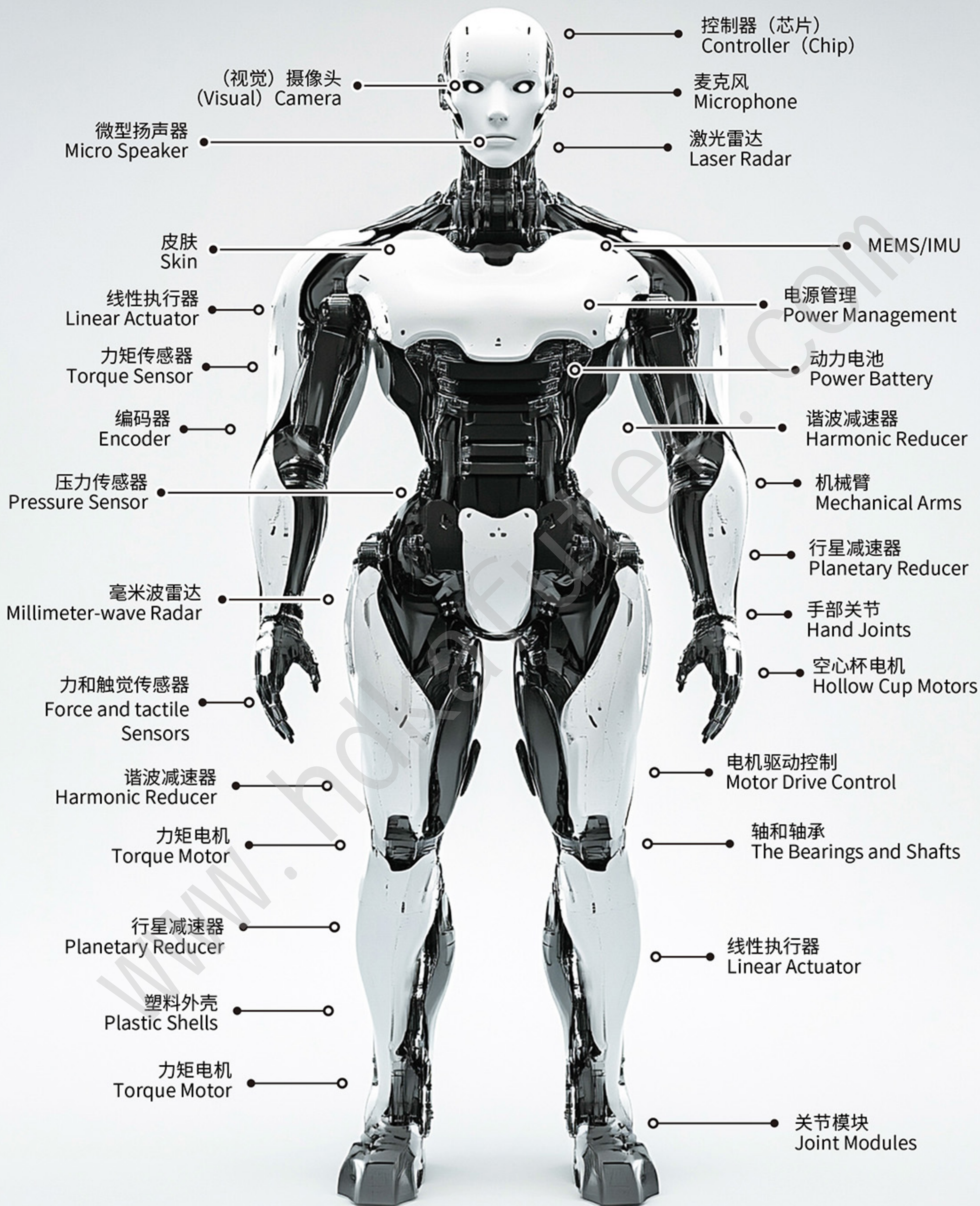
Humanoid Robots

Adhesive Solutions for Full
Assembly & Component Bonding



广东恒大新材料科技有限公司
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人形机器人组装及相关部件防水用粘接、密封、灌封胶

Adhesives, sealants, and potting compounds designed to waterproof humanoid robot assemblies and some components

对接线端子、航插、线束、主控板、电池仓、连接器、外壳端盖、驱动电路、传感器舱体等处进行粘接、密封或灌封，提高防水及防震等作用。

Adhesive, sealant or potting is applied to wire terminals, aviation plugs, wire harnesses, main control boards, battery compartments, connectors, housing end covers, drive circuits and sensor compartments to enhance waterproofing and vibration resistance.

胶水型号	外观	配比	剪切强度(MPa)	硬度	特性
Product	Appearance	Mix Ratio	Shear Strength	Hardness	Properties
K-6821	黑色液体	2:1	$\geq 2(\text{AL/AL})$	30~50 A	较好粘接力灌封软胶
K-6821	Black Liquid	2:1	$\geq 2(\text{AL/AL})$	30~50 A	Potting compound, excellent adhesion properties
K-9765B	黑色粘稠液	1:1	$\geq 10(\text{sus/sus})$	$\geq 50 \text{ D}$	对多种塑料粘接好
K-9765B	Black Viscous	1:1	$\geq 10(\text{sus/sus})$	$\geq 50 \text{ D}$	Good adhesion to various plastics
K-5707T	半透明粘稠液	/	$\geq 1.2(\text{AL/AL})$	20~30 A	对塑料和涂层粘接好
K-5707T	Translucent viscous Liquid	/	$\geq 1.2(\text{AL/AL})$	20~30 A	Good adhesion to plastics and coatings
K-5586	黑色膏状	/	/	20~30 A	可代替橡胶垫片使用
K-5586	Black Paste	/	/	20~30 A	Can be used as a substitute for rubber gaskets



塑料外壳或皮肤的粘接

Adhesive for bonding plastic shells or skins

PC、ABS等塑料外壳的粘接，可以快速固定组装；硅胶皮肤与金属或塑料表面的粘接，可提升皮肤外观逼真度。

The adhesive can quickly fix and assemble PC, ABS and other plastic shells; it can also bond silicone skin to metal or plastic surfaces, enhancing the realism of the skin's appearance.

胶水型号	外观	粘度(mPa·s)	定位时间(s)	剪切强度(MPa)	特性
Product	Appearance	Viscosity	Fixing Time	Shear Strength	Properties
K-4460	无色液体	230~430	10~45	$\geq 13(45\# \text{钢})$	低白化
K-4460	Colorless Liquid	230~430	10~45	$\geq 13(45\# \text{Steel})$	Low Volatility

* 配合使用表面处理剂如K-4775，粘接效果更佳

* When used in conjunction with a surface treatment agent such as K-4475, the bonding effect is better.



电池导热粘接固定胶

Thermal conductive adhesive for battery fixation.

用于电池单体与散热片、外壳的粘接，有固定、防水、导热及抗震等作用。

It is used for bonding battery shells to heat sinks and shells, providing fixation, waterproofing, thermal conductivity, and vibration resistance.

胶水型号	外观	配比	剪切强度(MPa)	导热系数(W/m.k)	硬度(Shore A)
Product	Appearance	Mix Ratio	Shear Strength	Thermal Conductivity	Hardness
K-6252	淡黄色液体	1:1(体积比)	$\geq 8(\text{AL/AL})$	1.2 ± 0.2	85~95
K-6252	Pale Yellow	1:1(Volume Ratio)	$\geq 8(\text{AL/AL})$	1.2 ± 0.2	85~95



人形机器人组装中多种激光雷达、毫米波雷达、摄像头、传感器、音响等粘接固定胶

Adhesive for bonding and fixing various laser radars, millimeter-wave radars, cameras, sensors, speakers and other components in the assembly of humanoid robots.

根据人形机器人中雷达、摄像头及传感器等部件特性、使用场景及性能要求，胶水粘接是常用的固定方法之一，且有多种方案可选。胶水与机械结构深度结合，可共同提升人形机器人的可靠性与性能。

According to the characteristics, usage scenarios and performance requirements of components such as radars, cameras and sensors in humanoid robots, adhesive bonding is one of the commonly used fixing methods, and there are multiple options available. The deep integration of adhesive with mechanical structures can jointly enhance the reliability and performance of humanoid robots.

胶水型号	胶水类型	配比	外观(使用前)	剪切强度(MPa)	拉断伸长率(%)	拉伸强度(MPa)
Product	Chemical Type	Mix Ratio	Appearance(Before Use)	Shear Strength	Elongation at Break	Tensile Strength
K-6820-2	杂化胶	2:1	灰黑液体	≥ 4 (PC/PC)	≥ 400	≥ 6
K-6820-2	Hybrid Adhesive	2:1	Grayish Black	≥ 4 (PC/PC)	≥ 400	≥ 6
K-6504	聚氨酯热熔胶	/	淡黄固体	≥ 5 (PC/PC)	≥ 800	≥ 8
K-6504	Polyurethane Hot Melt Adhesive	/	Pale Yellow Solid	≥ 5 (PC/PC)	≥ 800	≥ 8



人形机器人组装用螺纹锁固胶

Threadlocking adhesive for assembling humanoid robots.

人形机器人的各种机械连接较多，如头部、躯干、连杆、机械臂、关节模块、行走机构等，以及电池、传感器模块等，需承受较高负载、或高频振动，螺纹的紧固和防松非常必要。

Humanoid robots have numerous mechanical connections, such as the head, torso, links, mechanical arms, joint modules, walking mechanisms, as well as battery and sensor modules, which need to withstand high loads or high-frequency vibrations. The tightening and loosening prevention of threads are very necessary.

胶水型号	外观	粘度(mPa·s)	破坏扭矩(N.m)	平均拆卸扭矩(N.m)	特性
Product	Appearance	Viscosity	Breaking Torque	Average Removal Torque	Properties
K-0243	蓝色粘稠液	1000~3000	11~20	6~14	中强度，可拆
K-0243	Blue Viscous	1000~3000	11~20	6~14	Medium Strength, Removable
K-0277	红色粘稠液	4000~8000	≥ 22	≥ 22	高强度，不可拆
K-0277	Red Viscous Liquid	4000~8000	≥ 22	≥ 22	High Strength, Non-removable



人形机器人各种轴承的圆柱固持胶

Cylindrical retaining compound for various bearings in humanoid robots.

人形机器人的髋关节轴承、夹持器法兰与机械臂轴的连接、轴承与连杆的配合、足关节轴承与销轴、头部旋转关节的轴承与轴等多处，需提供高可靠性的圆柱配合连接，并满足环境温度、动态载荷及维护的需求。

In humanoid robots, the hip joint bearings, the connection between the gripper flange and the mechanical arm shaft, the fit between the bearings and the links, the foot joint bearings and the pin shaft, and the bearings and shafts of the head rotation joint, among many other places, require highly reliable cylindrical retaining compound. These retaining compound must also meet the demands of ambient temperature, dynamic loads and maintenance.

胶水型号	外观	粘度(mPa·s)	剪切强度(MPa)	配合间隙(mm)	特性
Product	Appearance	Viscosity	Shear Strength	Fit Clearance	Properties
K-0648	绿色粘稠液	300~800	≥ 15 (45#钢)	≤ 0.1	高强度
K-0648	Green Viscous	300~800	≥ 15 (45#Steel)	≤ 0.1	High Strength

人形机器人控制器、编码器 PCB 涂覆保护用胶

Adhesives for PCB coating protection in humanoid robot controllers and encoders.

提高对PCB产品的防潮、防霉、防盐雾等多种防护性能，增加产品的可靠性和寿命。
Improve the moisture, mold, and salt fog protection of PCB products to enhance their reliability and extend their lifespan.

胶水型号	外观	粘度(mPa·s)	硬度(Shore D)	附着力	阻燃性	特性
Product	Appearance	Viscosity	Hardness	Adhesion	Flame Resistance	Properties
K-3665	无色透明液	150~500	50~70	0级	满足UL94 V-0	UV湿气双固化
K-3665	Colorless Transparent	150~500	50~70	Level 0	UL94 V-0	UV and Moisture Dual Curing

伺服电机、电源模块用导热凝胶

Thermal conductive gel for servomotors and power modules.

导热凝胶有较长的使用寿命与稳定性，较低应力和较高的适应性。适用于对应力敏感关节电机绕组，以及电源模块等进行导热散热。
Thermal conductivity gel offers a long lifespan and stability, low stress and high adaptability, making it ideal for heat conduction and dissipation in stress-sensitive components like motor windings and power modules.

胶水型号	外观	导热系数	阻燃性	可压缩厚度(mm)	适用温度(°C)
Product	Appearance	Thermal Conductivity	Flame Resistance	Compressible Thickness	Operating Temperature
K-5233	蓝色膏状	4.0±0.5	满足UL94 V-0	≤0.1	-50~200
K-5233	Blue Paste	4.0±0.5	UL94 V-0	≤0.1	-50~200

导电和电磁屏蔽胶

Conductive and electromagnetic shielding adhesive.

作为电磁屏蔽，可用于毫米波或微波雷达，能够有效阻隔或衰减电磁波，从而保证人形机器人内部电路的正常运行；作为导电胶，能让导电连接获得保障。
This material serves as an effective electromagnetic shield for millimeter-wave and microwave radar applications, safeguarding the internal circuits of humanoid robots by blocking or attenuating electromagnetic interference. Additionally, it functions as a reliable conductive adhesive, ensuring secure and conduction connections.

胶水型号	外观	导电材质	固化方式	体积电阻率(Ω.cm)	屏蔽效能
Product	Appearance	Conductive Material	Curing Method	Volume Resistivity	Shielding Function
K-5952	灰色	Ni/C	吸湿固化	≤0.05	90~100 dB
K-5952	Gray	Ni/C	Moisture Curing	≤0.05	90~100 dB



线材、元器件、接线端子等固定胶

Adhesive for fixing wires, components, and terminal blocks.

施胶后能抗振动，适合线材、元器件和端子的固定捆扎和应力释放。如电池线束施胶后可避免运动摩擦断裂，运动关节线束使用胶水能起到固定和缓冲振动的功能。

This adhesive applied provides excellent vibration resistance, making it ideal for securing wires, components, and terminal blocks as well as relieving stress. For instance, in battery harness, the adhesive helps prevent fractures caused by movement friction, while in motion joints, it serves to stabilize and cushion against vibration.

胶水型号	胶水类型	外观	剪切强度(MPa)	拉断伸长率(%)	拉伸强度(MPa)
Product	Chemical Type	Appearance	Shear Strength	Elongation at Break	Tensile Strength
K-6820-2	2K杂化胶	灰黑	≥4(PC/PC)	≥400	≥6
K-6820-2	2K Hybrid Adhesive	Grayish Black	≥4(PC/PC)	≥400	≥6
K-6008T	改性硅胶	半透明粘稠液	≥2(AL/AL)	≥150	≥3
K-6008T	Modified Silane	Translucent Viscous	≥2(AL/AL)	≥150	≥3
K-3731H	UV胶	淡黄透明液	≥6(PC/PC)	≥100	≥14
K-3731H	UV Adhesive	Pale Yellow Transparent	≥6(PC/PC)	≥100	≥14



铝合金、碳纤维或复合材料骨架与机械臂加固等结构粘接胶

Adhesive for structural bonding of aluminum alloy, carbon fiber or composite material skeletons with mechanical arm reinforcement.

胶水对人形机器人的PEEK、镁合金、铝合金、碳纤维及复合材料，如骨架与机械臂等进行加固；电机与框架粘接加固；电机法兰与谐波减速器壳体等进行刚性固定；也适用于轻量化、高刚性需求或复杂曲面连接场景，能分散应力，对如机械臂关节的抗高频振动也很有帮助。

The adhesive is used to reinforce the Peek, magnesium alloy, aluminum alloy, carbon fiber and composite material of humanoid robots, such as skeleton and mechanical arms; it also bonds and reinforce motors to frames, and rigidly fixes motor flanges to harmonic reducer housings. Additionally, it is also suitable for scenarios requiring lightweight, high rigidity or complex curved surface connections. It can disperse stress and is also very beneficial for withstanding high-frequency vibration, such as those in robot arm joints.

胶水型号	配比	外观	操作时间(min)	剪切强度(MPa)	硬度(Shore D)	特性
Product	Mix Ratio	Appearance	Operating Time	Shear Strength	Hardness	Properties
K-9341	2:1	黑色	20~45	18~28(45#钢)	68~84	高韧性，高强度
K-9341	2:1	Black	20~45	18~28(45#Steel)	68~84	High Toughness, High Strength
K-8307-1	1:1	深褐色	2~4	≥15(sus/sus)	60~70	低气味，固化快
K-8307-1	1:1	Dark Brown	2~4	≥15(sus/sus)	60~70	Low odor, Fast Curing

*本文的1K/2K为单组分/双组份（胶水）的替代简称，方便排版。

* In this text,1K / 2K are abbreviations for single-component / dual-component (adhesive) to facilitate typesetting.



人形机器人电机用胶

Adhesive for humanoid robots motors.

1) 关节处无框力矩电机灌封胶，具有导热、绝缘、抗震动，耐温好等特点。

Potting compound for frameless torque motors at joints, featuring thermal conductivity, insulation, vibration resistance and good temperature resistance.

胶水型号	外观	配比	粘度(mPa·s)	导热系数(W/m.k)	阻燃性	耐温范围(°C)
Product	Appearance	Mix Ratio	Viscosity	Thermal Conductivity	Flame Resistance	Temperature Range
K-9685	微黄液体	100:12	A:68000~75000 B:50~200	1.2~1.5	满足UL94 V-0	-40~150
K-9685	Slightly Yellow	100:12	A:68000~75000 B:50~200	1.2~1.5	UL94 V-0	-40~150

2) 电机磁钢粘接胶

Adhesive for bonding motor magnet.

如中空关节的无框力矩电机，磁钢粘接是很重要的。需要有优良的抗剥离、抗冲击等机械性能，和良好的电气性能。

For frameless torque motors in hollow joints, magnet bonding is very important. It requires excellent mechanical properties such as peel resistance, impact resistance as well as good electrical performance.

胶水型号	胶水类型	配比	粘度(mPa·s)	推荐固化条件	特性
Product	Chemical Type	Mix Ratio	Viscosity	Curing Conditions	Properties
K-9432	1K 环氧胶	/	200000~300000	210~240°C40S (感应加热)	感应加热，固化快
K-9432	1K Epoxy Adhesive	/	200000~300000	210~240°C40S (Inductive Heating)	Inductive Heating, Fast Curing
K-9320	2K 环氧胶	1:1	43000~50000	120°C30min 或25°C72h	耐高温180°C,短期300°C
K-9320	2K Epoxy Adhesive	1:1	43000~50000	120°C30min or 25°C72h	High temperature resistance: 180°C continuously short-term exposure up to 300°C
K-8102	2K 丙烯酸胶	1:1	5000~10000	25°C24h	室温初固快，耐温150°C
K-8102	2K Acrylic Adhesive	1:1	5000~10000	25°C24h	Fast initial curing at room temperature high temperature resistance: 150°C

3) 空心杯电机粘接密封胶

Adhesive and sealing compound for hollow cup motors.

胶水型号	胶水类型	外观	粘度(mPa·s)	推荐固化条件	特性
Product	Chemical Type	Appearance	Viscosity	Curing Conditions	Properties
K-9457	1K 环氧胶	灰色粘稠液	7000~13000	120°C30min	低粘度高渗透
K-9457	1K Epoxy Adhesive	Gray Viscous	7000~13000	120°C30min	Low viscosity, high penetration
K-0326	厌氧胶	黄色粘稠液	10000~20000	25°C24h	高粘度
K-0326	Anaerobic Adhesive	Yellow Viscous	10000~20000	25°C24h	High Viscosity

注：人形机器人中更多部件用胶，可参考我司相关传感器，激光雷达，移动终端，电机与电控，电池PACK等相关用胶解决方案。

Note: For more adhesive applications in humanoid robots, you can refer to our company's bonding solutions for sensors, laser radar, mobile device, motors and motor controllers, battery packs, and related components.

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