

工程机械非金属解决方案

Nonmetal Solutions for Heavy Equipment



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Spaulding
COMPOSITES INC.
斯伯丁复合材料



Pioneer
行业引领者



OEM
优质供应商



Global
多样解决方案

青岛斯伯丁复合材料有限公司
QINGDAO SPAULDING COMPOSITES CO., LTD.



- A** 斯伯丁复合材料有限公司建立于1873年，总部位于美国新罕布什尔，150多年来专注研究高分子聚合物技术。

Founded in 1873, Spaulding has been focusing on polymer technology over 150 years, with the headquarter located at New Hampshire USA



- B** 作为高分子材料领域的领导者，斯伯丁是卡特彼勒、小松、日立和恒立的长期合作伙伴，已持续为众多500强企业提供可靠的产品和独特的解决方案。

As pioneer of polymer industry in the world, Spaulding is a long-term partner of Caterpillar, Komatsu, Hitachi and Hengli, and has continued to provide reliable products and unique solutions for many Fortune 500 companies.

- C** 拥有经验丰富的工程师，可以根据不同工况提供定制方案，与客户共同开发产品。

We have experienced engineers to provide customized solutions for different conditions and develop products with clients.

- D** 斯伯丁致力于解决耐磨、密封和深冷支撑领域的应用难题。

Spaulding has been developing innovative solutions to wear-resisting, solid sealing and cryogenic supporting applications.



目录

CATALOG

产品 Product	产品牌号 Code	压缩强度 compressive Strength (Mpa)	压缩模量 Compressive Modulus (Mpa)	干摩擦系数 Friction Coefficients Dynamic (dry)	页码 Page
导向环 Guide Ring	PC50	290	3280	0.15~0.25	01/02
	PC60	450	3800	0.11~0.24	03/04
	PC70	325	2710	0.1~0.18	05/06
	PC71	330	2500	0.09~0.15	07/08
	PC72	300	2800	0.15~0.18	09/10
	PC80	152	6500	0.1~0.18	11
	PC81	164	6500	0.1~0.2	12
	PT20	86	2800	0.1~0.2	13
	EO12	68 (5%strain)	2100	0.1~0.18	14
	T55	300	7500	0.1~0.2	15

产品 Product	产品牌号 Code	压缩强度 compressive Strength (Mpa)	干摩擦系数 Friction Coefficients Dynamic (dry)	页码 Page
轴套/垫片 Bearing Sleeve/ Washer	L-589	300	0.15~0.27	16
	T-768	290	0.13~0.25	17/18
	T-601	245	0.2~0.4	19/20
	T-602	240	0.15~0.32	21/22
	ARK-2	440	0.25~0.4	23
	ARK-X2	330	0.2~0.4	24
	EO12	68 (5%strain)	0.1~0.18	25
	EE10	103.25	0.1~0.2	26

产品 Product	产品牌号 Code	硬度 Hardness (Shore D)	拉伸强度 Tensile Strength (MPa)	断裂伸长率 Elongation at Break (%)	页码 Page
调整垫片 Shim	UP01	65	32.5	312	27
	TP01	71	49	350	28

产品 Product	产品牌号 Code	硬度 Hardness	拉伸强度 Tensile Strength (MPa)	压缩强度 Compressive Strength (Mpa)	页码 Page
挡圈 Back-up Ring	Spauldite® P	/	/	/	29
	EO12	119HRR	67	68MPa (5%应变)	30
	EE10	95HRM	83.59	103.25	31

产品 Product	产品牌号 Code	硬度 Hardness	压缩变形率 Compression Set(%) @100°C 22h	工作温度 Service Temperature°C	页码 Page
防尘密封 Pin Dust Seal	TP07	85A	43	-40~+80	32
	TP08	90A	45	-35~+80	32
	TP09	90A	33	-35~+100	32
	TP10	95A	33.5	-35~+100	32

产品 Product	产品牌号 Code	静态极限负载 Static maximum load (Mpa)	动态极限负载 Dynamic maximum load (Mpa)	干运行最大速度 Maximum speed m/s (dry)	页码 Page
自润滑轴承 Self-lubricating Bearing	FW-1006	483	207	0.13	33/34
	FW-1007	240	160	0.2	35
	FW-1008	240	30	0.4	36

第一章 导向环

GUIDE RING

Spauldite® PC50

高强度酚醛夹布材料

High-Strength Fabric-Reinforced Phenolic Resin



材料介绍

Material Introduction

Spauldite® PC50 是以热固性酚醛树脂为基材，高强度合成纤维为增强材料，添加自润滑剂微粉，在一定的温度和压力下热固成型的高强度复合材料。具有优异的耐磨性和抗冲击性能，自润滑、高负载，良好的柔韧性。

Spauldite® PC50 is a high-strength composite material formed by thermosetting phenolic resin as the base material, reinforced with high-strength polyester fibers, and supplemented with self-lubricating micro-powders. It is molded under certain temperature and pressure conditions. It possesses excellent wear resistance and impact resistance, self-lubrication, high load bearing capacity, and good flexibility.

典型应用

Typical Application

装载机、小型挖掘机液压油缸导向环——
Guide ring of wheel loader and mini excavator hydraulic cylinders

矿山设备液压支架导向环——
Guide ring of hydraulic support for mining equipment

材料性能

Material Performance



型号 Part Number		PC 50
颜色 Color		淡黄色 Light Yellow
密度 Density (g/cm³)		1.25 ~ 1.4
拉伸强度 Tensile Strength (Mpa)		42
压缩强度 Compressive Strength (Mpa)		290
冲击强度 Impact Strength (KJ/m²)		100
硬度 Rockwell Hardness (HRM)		92
摩擦系数 Coefficient of Friction	干 Dry	0.15 ~ 0.25
	油润滑 Oil	0.05 ~ 0.1
工作温度 Service Temperature (°C)		-55 ~ +130

第一章 导向环

GUIDE RING

Spauldite® PC60

高强度酚醛夹布材料

High-Strength Fabric-Reinforced Phenolic Resin



材料介绍

Material Introduction

Spauldite® PC60 是以热固性酚醛树脂为基材，耐高温、高强度特种纤维为增强材料，添加自润滑剂微粉，在一定的温度和压力下热固成型的高强度复合材料。具有优异的抗压、耐磨、耐高温性能。

Spauldite® PC60 is a high-strength composite material formed by thermosetting phenolic resin as the matrix, high temperature resistant, high-strength special fibers as reinforcing materials, and the addition of self-lubricating micro-powders. It undergoes thermal curing under specific temperature and pressure conditions. This material exhibits excellent compressive strength, wear resistance, and high-temperature resistance.

典型应用

Typical Application

中大型挖掘机液压油缸导向环——
Guide ring of medium and large excavator hydraulic cylinders
船舶海洋机械零部件——
Ship marine machinery parts

材料性能

Material Performance



型号 Part Number		PC 60
颜色 Color		灰色 Grey
密度 Density (g/cm³)		1.25 ~ 1.4
拉伸强度 Tensile Strength (Mpa)		82
压缩强度 Compressive Strength (Mpa)		450
冲击强度 Impact Strength (KJ/m²)		30
硬度 Rockwell Hardness (HRM)		110
摩擦系数 Coefficient of Friction	干 Dry	0.11 ~ 0.24
	油润滑 Oil	0.05 ~ 0.12
工作温度 Service Temperature (°C)		-55 ~ +200

Spauldite® PC70

聚酯夹布材料

Polyester Cloth Composite Material



材料介绍

Material Introduction

Spauldite® PC70 是以热固性改性聚酯树脂为基材，合成纤维为增强材料，添加自润滑剂微粉，在一定的温度和压力下热固成型的高强度复合材料。具有优异的自润滑性、耐磨性及尺寸稳定性等特点。

Spauldite® PC70 is a high-strength composite material formed by thermosetting modified polyester resin as the matrix, synthetic fibers as reinforcing materials, and the addition of self-lubricating micro-powders. It undergoes thermal curing under specific temperature and pressure conditions. This material features outstanding self-lubrication, wear resistance, and dimensional stability.

典型应用

Typical Application

长油缸导向环——
Guide ring of long hydraulic cylinders
船舶海洋机械零部件——
Ship marine machinery parts
水利发电零部件——
Hydroelectric power generation parts

材料性能

Material Performance



型号 Part Number		PC 70
颜色 Color		绿色 Green
密度 Density (g/cm ³)		1.2 ~ 1.4
拉伸强度 Tensile Strength (Mpa)		65
压缩强度 Compressive Strength (Mpa)		325
冲击强度 Impact Strength (KJ/m ²)		120
硬度 Rockwell Hardness (HRM)		80 ~ 90
摩擦系数 Coefficient of Friction	干 Dry	0.1 ~ 0.18
	油润滑 Oil	0.06 ~ 0.10
工作温度 Service Temperature (°C)		-55 ~ +130

Spauldite® PC71

聚酯夹布材料

Polyester Cloth Composite Material

材料介绍

Material Introduction

Spauldite® PC71 是以热固性改性聚酯树脂为基材，合成纤维为增强材料，添加自润滑剂微粉，在一定的温度和压力下热固成型的高强度复合材料。具有优异的自润滑性、耐磨性及尺寸稳定性等特点。

Spauldite® PC71 is a high-strength composite material formed by thermosetting modified polyester resin as the matrix, synthetic fibers as reinforcing materials, and the addition of self-lubricating micro-powders. It undergoes thermal curing under specific temperature and pressure conditions. This material features outstanding self-lubrication, wear resistance, and dimensional stability.

典型应用

Typical Application

- 长油缸导向环——
Guide ring of long hydraulic cylinders
- 船舶海洋机械零部件——
Ship marine machinery parts
- 水利发电零部件——
Hydroelectric power generation parts



材料性能

Material Performance



型号 Part Number		PC 71
颜色 Color	白色 white	
密度 Density (g/cm ³)	1.23 ~ 1.4	
拉伸强度 Tensile Strength (Mpa)	75	
压缩强度 Compressive Strength (Mpa)	330	
冲击强度 Impact Strength (KJ/m ²)	120	
硬度 Rockwell Hardness (HRM)	80 ~ 90	
摩擦系数 Coefficient of Friction	干 Dry	0.09 ~ 0.15
	油润滑 Oil	0.06 ~ 0.10
工作温度 Service Temperature (°C)	-55 ~ +130	

Spauldite® PC72

聚酯夹布材料

Polyester Cloth Composite Material



材料介绍

Material Introduction

Spauldite® PC72高强度复合材料以热固性改性聚酯树脂为基材，合成纤维为增强材料，添加耐磨改性润滑剂。具有高耐磨性，极低的吸水增长，良好的振动和冲击载荷能力，高承载能力等特点。

Spauldite® PC72 high-strength composite material is based on thermosetting modified polyester resin and reinforced with synthetic fibers. It contains friction modifier. PC72 has excellent wear resistance, extremely low moisture absorption growth, impact and shock resistance, and high load capacity.

典型应用

Typical Application

液压油缸导向环——
Guide ring of hydraulic cylinders
轴套——
Bearing Sleeve
船舶海洋机械零部件——
Ship marine machinery parts
水利发电零部件——
Hydroelectric power generation parts
石油化工设备零部件——
Petroleum machinery parts
农业机械零部件——
Agricultural machinery parts

材料性能

Material Performance



型号 Part Number		PC 72
颜色 Color		灰色 Grey
密度 Density (g/cm ³)		1.23 ~ 1.4
拉伸强度 Tensile Strength (Mpa)		70
压缩强度 Compressive Strength (Mpa)		300
冲击强度 Impact Strength (KJ/m ²)		120
硬度 Rockwell Hardness (HRM)		85 ~ 95
摩擦系数 Coefficient of Friction	干 Dry	0.15 ~ 0.18
	油润滑 Oil	0.07 ~ 0.11
工作温度 Service Temperature (°C)		-55 ~ +130

Spauldite® PC80

添加自润滑微粉的玻纤增强尼龙材料

GFR Nylon with Self-lubricating Powder

材料介绍

Material Introduction

Spauldite® PC80 是以尼龙为基材，玻纤增强并添加自润滑微粉的材料，具有优异的自润滑性、尺寸稳定性、韧性及高强度。

Spauldite® PC80 is a material based on nylon, reinforced with glass fiber and infused with self-lubricating micro-powders. It possesses outstanding self-lubrication, dimensional stability, toughness, and high strength.

典型应用

Typical Application

大型挖掘机导向环——Guide ring of hydraulic cylinders
垫片——Wear-resistant gasket



型号 Part Number		PC 80
颜色 Color	灰色 Grey	
密度 Density (g/cm ³)	1.59	
拉伸强度 Tensile Strength (Mpa)	180	
拉伸模量 Tensile Modulus (Mpa)	14000	
弯曲强度 Flexural Strength (MPa)	275	
冲击强度 Impact Strength (J/m)	120	
摩擦系数 Coefficient of Friction	干 Dry	0.1 ~ 0.18
	油润滑 Oil	0.05 ~ 0.1
工作温度 Service Temperature (°C)	-55 ~ +130	

Spauldite® PC81

玻纤增强尼龙材料

GFR Nylon

材料介绍

Material Introduction

Spauldite® PC81 是以尼龙为基材，玻纤增强的材料，具有优异的自润滑性、尺寸稳定性、韧性及高强度。

Spauldite® PC81 is a material based on nylon, reinforced with glass fiber. It possesses outstanding self-lubrication, dimensional stability, toughness and high strength.

典型应用

Typical Application

液压油缸导向环——Guide ring of hydraulic cylinders
垫片——Wear-resistant gasket



型号 Part Number		PC 81
颜色 Color	灰黑色 Dark grey	
密度 Density (g/cm ³)	1.46	
拉伸强度 Tensile Strength (Mpa)	196	
拉伸模量 Tensile Modulus (Mpa)	14000	
弯曲强度 Flexural Strength (MPa)	295	
冲击强度 Impact Strength (J/m)	150	
摩擦系数 Coefficient of Friction	干 Dry	0.1 ~ 0.2
	油润滑 Oil	0.06 ~ 0.12
工作温度 Service Temperature (°C)	-55 ~ +130	

Spauldite® PT20

改性聚甲醛

Modified Polyoxymethylene

材料介绍

Material Introduction

Spauldite® PT20 是聚甲醛改性材料，玻纤增强，具有优异的耐磨性、自润滑性、尺寸稳定性及优异的耐候性。

Spauldite® PT20 is a modified POM material, reinforced by glass fiber, with excellent wear resistance, self-lubrication, dimensional stability and excellent weather resistance

典型应用

Typical Application

液压油缸导向环——Guide ring of hydraulic cylinders



型号 Part Number		PT 20
颜色 Color		黑色 Black
密度 Density (g/cm ³)		1.56
拉伸强度 Tensile Strength (Mpa)		52
拉伸模量 Tensile Modulus (Mpa)		4800
弯曲模量 Flexural Modulus (MPa)		4600
摩擦系数 Coefficient of Friction	干 Dry	0.1 ~ 0.2
	油润滑 Oil	0.06 ~ 0.12
工作温度 Service Temperature (°C)		-55 ~ +130

Spauldite® E012

聚甲醛

Polyoxymethylene (POM)

材料介绍

Material Introduction

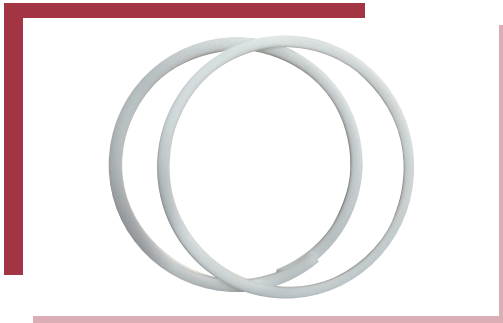
Spauldite® E012为聚甲醛材料，具备优异的耐磨性、自润滑性能、尺寸稳定性以及优异的耐候性和较好的耐化学品性。

Spauldite® E012 is a type of polyoxymethylene (POM) material. It has excellent wear resistance, self-lubrication, dimensional stability, outstanding weather resistance, and good chemical resistance.

典型应用

Typical Application

液压油缸导向环——Guide ring of hydraulic cylinders
挡圈——Back-up ring
止推垫片——Washer
轴套——Bearing Sleeve



材料性能

Material Performance

型号 Part Number	E012
密度 Density (g/cm ³)	1.41
硬度 Hardness (HRR)	119
拉伸强度 Tensile Strength (Mpa)	67
吸水率 Water Absorption (%)	0.05
断裂伸长率 Elongation at Break (%)	32

Spauldite® T55

以PEEK为基材的碳纤增强材料

Carbon Fiber Reinforced PEEK composite material

材料介绍

Material Introduction

Spauldite® T55是以PEEK为基材，碳纤增强的材料，具备优异的具有机械强度高、耐高温、耐冲击、耐酸碱、耐水解、耐磨、耐疲劳、尺寸稳定性、耐辐照及良好的电性能。

Spauldite® T55 is a carbon fiber reinforced PEEK composite with exceptional mechanical strength, high temperature resistance, impact resistance, acid and alkali resistance, hydrolysis resistance, wear resistance, fatigue resistance, dimensional stability, radiation resistance, and excellent electrical properties.

材料性能

Material Performance

型号 Part Number	T55
密度 Density (g/cm ³)	1.4
硬度 Hardness (HRR)	123
拉伸强度 Tensile Strength (MPa)	250
压缩强度 Compressive Strength (MPa)	300
断裂伸长率 Elongation at Break (%)	1.6
热变形温度 Deflection Temperature (°C)	336

典型应用

Typical Application

液压油缸导向环——Guide ring of hydraulic cylinders
挡圈——Back-up ring
垫片——Gasket
轴套——Bearing Sleeve



Spauldite® L-589

高强度酚醛夹布材料

High-Strength Fabric-Reinforced Phenolic Resin

材料介绍

Material Introduction

Spauldite® L-589 是由精细编织的棉纤维与酚醛树脂层压而成的材料并添加自润滑微粉。具有良好的耐磨性，很好的粘接性，良好的尺寸稳定性等特点。

Spauldite® L-589 is a material made by laminating finely woven cotton fabric with phenolic resin, with self-lubricant added. It has good wear resistance, well bonded, and good dimensional stability under operating conditions.

材料性能

Material Performance

型号 Part Number	L-589	
颜色 Color	棕色 Brown	
密度 Density (g/cm ³)	1.35~1.40	
弯曲强度 Flexural Strength (MPa)	145	
冲击强度 Impact Strength (KJ/m ²)	23	
硬度 Rockwell Hardness (HRM)	106	
压缩强度 Compressive Strength (Mpa)	300	
摩擦系数 Coefficient of Friction	干 Dry	0.15~0.27
	油润滑 Oil	0.10~0.12

典型应用

Typical Application

垫片——
Wear-resistant gasket
轴套——
Bearing Sleeve



Spauldite® T-768

高强度酚醛夹布材料

High-Strength Fabric-Reinforced Phenolic Resin



材料介绍

Material Introduction

Spauldite® T-768 是由精细编织的特殊改性高性能热固性树脂层压而成的材料,并添加自润滑剂。具有优异的抗摩擦和抗冲击性能,良好的柔韧性。

Spauldite® T-768 is a material made by laminating finely woven specially modified high-performance thermosetting resin , with self-lubricant added. It has good wear resistance, impact resistance and good dimensional stability under operating conditions.

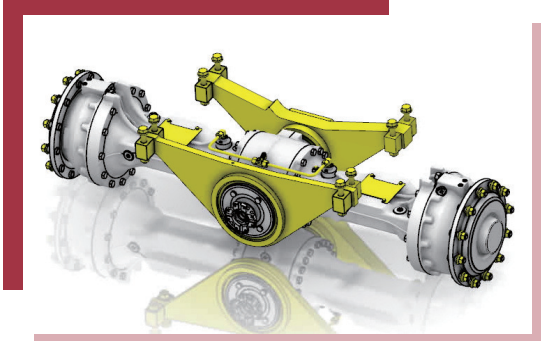
典型应用

Typical Application

工程机械摆动桥轴套、止推垫片——
Bearing sleeve and Washer-Thrust of engineering machine
液压机械立柱轴套——
Bearing sleeve of hydraulic machine

材料性能

Material Performance



型号 Part Number		T-768
颜色 Color		黑色 Black
密度 Density (g/cm ³)		1.35~1.40
压缩强度 Compressive Strength (Mpa)		290
冲击强度 Impact Strength (KJ/m ²)		20
硬度 Rockwell Hardness (HRM)		106
弯曲强度 Flexural Strength (MPa)		140
摩擦系数 Coefficient of Friction	干 Dry	0.13~0.25
	油润滑 Oil	0.08~0.11

Spauldite® T-601

高强度酚醛夹布材料

High-Strength Fabric-Reinforced Phenolic Resin



材料介绍

Material Introduction

Spauldite® T-601 是一种中粗棉布为加强基的酚醛树脂复合材料。它具有良好的物理性能和机械强度及韧性，可以抵抗震动和冲击载荷。T-601 材料还可以抵抗许多腐蚀性的化学物质并具有相对不错的加工表面精度。该材料达到并超出 NEMA C，美国军标 MIL-P-15035，FBM 类，LP 509 IIC 等材料标准。

Spauldite® T-601 is a cotton fabric reinforced phenolic resin composite material. It possesses excellent physical properties, mechanical strength and toughness, capable of withstanding vibration and impact loads. T-601 material is also resistant to various corrosive chemicals and maintains relatively good surface finish accuracy during processing. This material meets and exceeds standards such as NEMA C, US Military Standard MIL-P-15035, FBM, and LP509 IIC.

典型应用

Typical Application

液压缸导向环、纳污环、缓冲环——
Guide ring, Ring, Wear ring of hydraulic cylinders

工程机械摆动桥轴套、止推垫——
Bearing sleeve and Washer-Thrust of engineering machine

液压机械立柱轴套——
Bearing sleeve of hydraulic machine

材料性能

Material Performance



型号 Part Number		T-601
颜色 Color	棕色 Brown	
密度 Density (g/cm ³)	1.25 ~ 1.4	
弯曲强度 Flexural Strength (MPa)	110	
压缩强度 Compressive Strength (Mpa)	245	
冲击强度 Impact Strength (KJ/m ²)	40	
硬度 Rockwell Hardness (HRM)	95	
摩擦系数 Coefficient of Friction	干 Dry	0.2 ~ 0.4
	油润滑 Oil	0.12 ~ 0.15
工作温度 Service Temperature (°C)	-55 ~ +130	

Spauldite® T-602

高强度酚醛夹布材料

High-Strength Fabric-Reinforced Phenolic Resin

材料介绍

Material Introduction

Spauldite® T-602 是一种内含自润滑剂，以棉布为加强基的酚醛树脂复合材料。它具有低摩擦系数，优异的抗摩擦性能和物理韧性，以及良好的机械强度。天然石墨均匀分布在材料内部以保证每个摩擦面都能得到润滑。T-602 材料可以承受很高的压缩载荷并在高负载情况下表现出优异的抗蠕变性能。

Spauldite® T-602 is a cotton fabric reinforced phenolic resin composite material with the addition of graphite lubricant. It features a low coefficient of friction, excellent anti-friction performance, physical toughness, and good mechanical strength. Natural graphite is uniformly distributed within the material to ensure lubrication on every friction surface. T-602 material can withstand high compressive loads and demonstrates outstanding resistance to creep under high-load conditions.



典型应用

Typical Application

- 液压油缸导向环——
Guide ring of hydraulic cylinders
- 工程机械摆动桥轴套、止推垫——
Bearing sleeve and Washer-Thrust of engineering machine
- 液压机械立柱轴套——
Bearing sleeve of hydraulic machine



材料性能

Material Performance



型号 Part Number		T-602
颜色 Color		灰黑色 Dark grey
密度 Density (g/cm ³)		1.25 ~ 1.4
弯曲强度 Flexural Strength (MPa)		105
压缩强度 Compressive Strength (Mpa)		240
冲击强度 Impact Strength (KJ/m ²)		35
硬度 Rockwell Hardness (HRM)		90
摩擦系数 Coefficient of Friction	干 Dry	0.15 ~ 0.32
	油润滑 Oil	0.08 ~ 0.12
工作温度 Service Temperature (°C)		-55 ~ +130

第二章 轴套 / 垫片

BEARING SLEEVE/WASHER

Spauldite® ARK-2

高强度酚醛夹布材料

High-Strength Fabric-Reinforced Phenolic Resin

材料介绍

Material Introduction

Spauldite® ARK-2 是由中等密度编织的高强度高耐温的聚合物纤维与热固性树脂层压而成的材料。具有卓越的耐磨性，超高的耐冲击性能，极低的吸水增长。热分解温度可达500°C，可以在200°C的工况下长期工作。

Spauldite® ARK-2 is a material made by laminating woven fabric with thermosetting resin. It has excellent wear-resistance, excellent impact strength, extremely low moisture growth, can work continuously in the 200°C condition, thermal decomposition temperature is above 500°C.

典型应用

Typical Application

工程机械摆动桥轴套、止推垫片 ——
Bearing Sleeve and Washer-Thrust of engineering machine
液压机械立柱轴套 ——
Bearing Sleeve of hydraulic machine
气动工具叶片 ——
Rotor vanes of air tools

材料性能

Material Performance

型号 Part Number	ARK-2
颜色 Color	浅黄色~棕色 Light yellow to brown
密度 Density (g/cm ³)	1.30~1.35
弯曲强度 Flexural Strength (MPa)	195
冲击强度 Impact Strength (KJ/m ²)	90
硬度 Rockwell Hardness (HRM)	106
压缩强度 Compressive Strength (Mpa)	440

第二章 轴套 / 垫片

BEARING SLEEVE/WASHER

Spauldite® ARK-X2

高强度酚醛夹布材料

High-Strength Fabric-Reinforced Phenolic Resin

材料介绍

Material Introduction

Spauldite® ARK-X2 是由中等密度编织的高强度高耐温的聚合物纤维与热固性树脂层压而成的材料。具有优良的耐磨性和耐冲击性能，极低的吸水增长。

Spauldite® ARK-X2 is a material made by laminating woven fabric with thermosetting resin. It has good wear-resistance, good impact strength and low moisture growth.

典型应用

Typical Application

工程机械摆动桥轴套、止推垫片 ——
Bearing Sleeve and Washer-Thrust of engineering machine
液压机械立柱轴套 ——
Bearing Sleeve of hydraulic machine
气动工具叶片 ——
Rotor vanes of air tools

材料性能

Material Performance

型号 Part Number	ARK-X2
颜色 Color	浅黄色~棕色 Light yellow to brown
密度 Density (g/cm ³)	1.30~1.35
弯曲强度 Flexural Strength (MPa)	150
冲击强度 Impact Strength (KJ/m ²)	50
硬度 Rockwell Hardness (HRM)	100
压缩强度 Compressive Strength (Mpa)	330

Spauldite® E012

聚甲醛

Polyoxymethylene (POM)

材料介绍

Material Introduction

Spauldite® E012为聚甲醛材料, 具备优异的耐磨性、自润滑性能、尺寸稳定性以及优异的耐候性和较好的耐化学品性。

Spauldite® E012 is a type of polyoxymethylene (POM) material. It has excellent wear resistance, self-lubrication, dimensional stability, outstanding weather resistance, and good chemical resistance.

材料性能

Material Performance

型号 Part Number	E012
密度 Density (g/cm ³)	1.41
硬度 Hardness (HRR)	119
拉伸强度 Tensile Strength (Mpa)	67
吸水率 Water Absorption (%)	0.05
断裂伸长率 Elongation at Break (%)	32

典型应用

Typical Application

液压油缸导向环——Guide ring of hydraulic cylinders
挡圈——Back-up ring
止推垫片——Washer
轴套——Bearing Sleeve



Spauldite® EE10

热塑性聚酯

Polyethylene Terephthalate (PET)

材料介绍

Material Introduction

Spauldite® EE10为PET材料, 具备优异的耐磨性、低摩擦系数、高强度、低温韧性以及良好的尺寸稳定性。

Spauldite® EE10 is a PET material that exhibits exceptional wear resistance, low friction coefficient, high strength, low-temperature toughness, and excellent dimensional stability.

材料性能

Material Performance

型号 Part Number	E010
密度 Density (g/cm ³)	1.353
硬度 Hardness (HRM)	95
拉伸强度 Tensile Strength (MPa)	83.59
拉伸模量 Tensile Modulus (MPa)	3702
弯曲强度 Flexural Strength (MPa)	150
断裂伸长率 Elongation at Break (%)	16.6
压缩强度 Compressive Strength (MPa)	103.25

典型应用

Typical Application

挡圈——Back-up ring
垫片——Washer
轴套——Bearing Sleeve



Spauldite® UP01

超高分子量聚乙烯

UHMWPE

材料介绍

Material Introduction

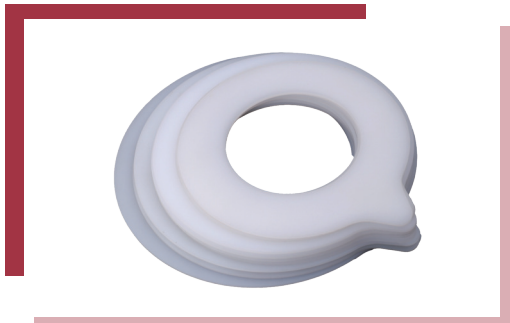
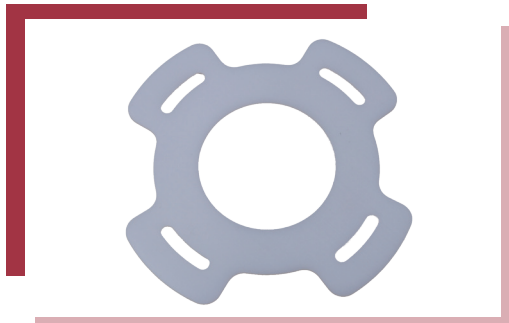
Spauldite® UP01为超高分子量聚乙烯材料,具备优异的自润滑性能、耐磨性、耐冲击、耐腐蚀性能以及吸收冲击能的特点。

Spauldite® UP01, an ultra-high molecular weight polyethylene, it has superior self-lubricity, wear resistance, impact toughness, corrosion resistance, and impact resistance.

典型应用

Typical Application

调整垫片——Adjustment Shim
滑块——Block
密封件——Ring Seal



材料性能

Material Performance

型号 Part Number	UP01
硬度 Hardness (Shore D)	65
拉伸强度 Tensile Strength (MPa)	32.5
断裂伸长率 Elongation at Break (%)	312

Spauldite® TP01

高性能热塑性聚氨酯

弹性体材料

High Performance TPU

材料介绍

Material Introduction

高性能TPU材料通过优化配方设计,能够产生更好的相分离和更强的链段结构,具有较高的机械强度、优异的耐高温、耐低温性能和较低的压缩变形率。

The high-performance TPU material can generate betterphase separation and a stronger chain segment structurethrough optimized formulation design, providing highmechanical strength, excellent high and low temperatureperformance, and low compression set.

典型应用

Typical Application

调整垫片——Shim



材料性能

Material Performance

型号 Part Number	TP01
密度 Density (g/cm³)	1.24
硬度 Hardness	71D
拉伸强度 Tensile Strength (MPa)	49
模量 100% Modulus (MPa)	27
断裂伸长率 Elongation at Break (%)	350
磨耗 DIN Abrasion (mm³)	33

Spauldite® P 系列

聚四氟乙烯

PTFE

材料介绍

Material Introduction

Spauldite® P 系列材料是 PTFE 及相关改性材料，能耐几乎所有的液压介质、溶剂和各种化学介质，具有极低的摩擦系数，无爬行现象。抗臭氧性、耐候性极佳，具阻燃性。

Spauldite® P is a kind of PTFE related modified material, which can withstand almost all hydraulic media, solvents and various chemical media, with very low friction coefficient and no creeping phenomenon. Ozone resistance, excellent weather resistance, and flame retardancy.

典型应用

Typical Application

- 挡圈, 旋转密封圈——Ring-Back up, Seal
- 阀片——Valve Plate
- 导向带——Guide Ring



型号 Part Number	颜色 Color	密度 Density g/cm³	邵尔硬度 D Shore Hardness D	拉伸强度 Tensile Strength MPa	断裂伸长率 Tensile Strain at Break %	工作温度 Service Temperature °C
P811	白色 White	≥2.2	56±2	27.5	303.6	-200~+260
P812	白色 White	≥2.28	61±2	16.6	314.8	-200~+260
P814	白色 White	≥2.22	57±2	22.8	312	-200~+260
P815	咖啡色 Brown	≥3.12	62±2	20.8	288.6	-200~+260
P816	咖啡色 Brown	≥3.41	64±2	18.4	228	-200~+260
P818	绿色 Green	≥3.04	64±2	15.9	270.1	-200~+260

Spauldite® E012

聚甲醛

Polyoxymethylene(POM)

材料介绍

Material Introduction

Spauldite® E012为聚甲醛材料，具备优异的耐磨性、自润滑性能、尺寸稳定性以及优异的耐候性和较好的耐化学品性。

pauldite® E012 is a type of polyoxymethylene (POM) material. thas excellent wear resistance, self-lubrication, dimensional tability, outstanding weather resistance, and good chemical esistance.

典型应用

Typical Application

- 液压油缸导向环——Guide ring of hydraulic cylinders
- 挡圈——Back-up ring
- 止推垫片——Washer
- 轴套——Bearing Sleeve



材料性能

Material Performance

型号 Part Number	E012
密度 Density (g/cm³)	1.41
硬度 Hardness (HRR)	119
拉伸强度 Tensile Strength (Mpa)	67
吸水率 Water Absorption (%)	0.05
断裂伸长率 Elongation at Break (%)	32

Spauldite® EE10

热塑性聚酯

Polyethylene Terephthalate (PET)

材料介绍

Material Introduction

Spauldite® EE10为PET材料, 具备优异的耐磨性、低摩擦系数、高强度、低温韧性以及良好的尺寸稳定性。

Spauldite® EE10 is a PET material that exhibits exceptional wear resistance, low friction coefficient, high strength, low-temperature toughness, and excellent dimensional stability.

材料性能

Material Performance

型号 Part Number	E010
密度 Density (g/cm ³)	1.353
硬度 Hardness (HRM)	95
拉伸强度 Tensile Strength (MPa)	83.59
拉伸模量 Tensile Modulus (MPa)	3702
弯曲强度 Flexural Strength (MPa)	150
断裂伸长率 Elongation at Break (%)	16.6
压缩强度 Compressive Strength (MPa)	103.25

典型应用

Typical Application

挡圈 — Back-up ring
垫片 — Washer
轴套 — Bearing Sleeve



Spauldite® TP

高性能热塑性聚氨酯弹性体材料

High Performance TPU

典型应用

Typical Application

骨架防尘 — Pin Dust Seal
调整垫片 — Shim



材料介绍

Material Introduction

高性能TPU材料通过优化配方设计, 能够产生更好的相分离和更强的链段结构, 具有较高的机械强度、优异的耐高温、耐低温性能和较低的压缩变形率, 确保密封件具有较长的使用寿命, 特别是在100℃的高温下仍能保持较高的密封效果。

The high-performance TPU material can generate better phase separation and a stronger chain segment structure through optimized formulation design, providing high mechanical strength, excellent high and low temperature performance, and low compression set. This ensures that the seals have a long service life, especially maintaining high sealing force even at high temperatures 100°C.

材料性能

Material Performance

型号 Part Number	TP07	TP08	TP09	TP10
密度 Density (g/cm ³)	1.19	1.19	1.19	1.19
硬度 Hardness	85A	90A	90A	95A
拉伸强度 Tensile Strength (MPa)	46.5	47.5	48.5	50.5
模量 100% Modulus (MPa)	7.1	8.5	10	14
断裂伸长率 Elongation at Break (%)	530	515	535	450
撕裂强度 Tear Stress (N/mm)	100	115	120	120
压缩变形率 Compression Set (%) @100°C 22h	43	45	33	33.5
Tr10 (°C)	-35	-30	-35	-30
磨耗 DIN Abrasion (mm ³)	32	32	32	31
工作温度 Service temperature (°C)	-40~+80	-35~+80	-35~100	-35~100

Spauldite® FW-1006

纤维缠绕自润滑轴承

Fiber-reinforced self-lubricating bearing



材料介绍

Material Introduction

Spauldite® FW-1006自润滑轴承的内衬层采用了独特的PTFE超细纤维与耐磨纤维混合编织结构，并且在内衬层材料表面加入润滑剂，可降低初始摩擦系数，避免轴承在初始启动时产生的间歇性的粘性滑动或者噪音。轴承的背衬层用连续玻璃纤维增强体与高强度、耐腐蚀的环氧树脂作为粘合剂通过缠绕成型，这种复合物背衬确保了轴承极佳的机械特性，可承受高达483MPa的静态负载。非金属自润滑轴承的线膨胀系数远低于钢及大部分金属，使运行过程中轴承的尺寸变化较小。

Spauldite® FW-1006 self-lubricating bearings have a unique inner liner composed of hybrid woven structure of ultra-fine PTFE fibers and wear-resistant fibers, with special lubricant added to the inner liner surface to reduce the initial friction coefficient and preventing intermittent stick-slip or noise during the bearing's initial startup. The bearing's backing layer is made of winding glass fiber reinforcements, with the high-strength, corrosion-resistant epoxy resin as the binder. This composite backing ensures exceptional mechanical properties of the bearing, and enable the bearing withstand static loads up to 483 MPa. With a significantly lower coefficient of linear thermal expansion compared to steel and most metals, non-metal self-lubricating bearings exhibit minimal dimensional changes during operation.

典型应用

Typical Application

- 转向装置联结器——
Steering Linkage Connector
- 起重机臂——
Crane boom
- 铲运设备——
Earthmoving Equipment
- 滑移装载机——
Skid steer loader
- 液压缸心轴——
Hydraulic cylinder piston rod
- 主销轴承——
Kingpin bearing

材料性能

Material Performance

型号 Part Number	FW-1006
颜色 Color	灰色 Grey
密度 Density (g/cm ³)	1.85~2.00
吸水率 Water Absorption Rate (24h) /%	0.16
静态极限负载 Max. Static Load (Mpa)	483
动态极限负载 Max. Dynamic Load (Mpa)	207
温度范围 Temperature Range (°C)	-198~163
热膨胀系数 Coefficient of Thermal Expansion (m/m/°C)	8.9x10 ⁻⁶
热导率 Coefficient of Thermal Conductivity W/(m.K)	0.23~0.33
干运行最大速度 Max. PV Dry running (m/s)	0.13



Spauldite® FW-1007

纤维缠绕自润滑轴承

Fiber-reinforced self-lubricating bearing

材料介绍 Material Introduction

Spauldite® FW-1007。轴承的自润滑内衬层以PTFE纤维与高强度纤维填充，配以含内部润滑剂的高强度环氧树脂，有较高的承载能力和很好的耐磨性.轴承的背衬层用连续玻璃纤维增强高强度、耐腐蚀的环氧树脂作为承载层，这种复合物背衬确保了轴承极佳的机械特性，尤其是耐疲劳性能。

Spauldite® FW-1007 The self-lubricating inner lining of the bearing is filled with PTFE fibers and high-strength fibers, combined with high-strength epoxy resin containing internal lubricants, which has high load-bearing capacity and excellent wear resistance. The backing layer of the bearing is made of continuous glass fiber reinforced high-strength, corrosion-resistant epoxy resin as the load-bearing layer. This composite backing ensures excellent mechanical properties of the bearing, especially fatigue resistance.

材料性能 Material Performance

型号 Part Number	FW-1007
颜色 Color	黑色 Black
密度 Density (g/cm³)	1.90
吸水率 Water Absorption Rate (24h) /%	0.13
静态极限负载 Max. Static Load (Mpa)	240
动态极限负载 Max. Dynamic Load (Mpa)	160
温度范围 Temperature Range (°C)	-163~163
热膨胀系数 Coefficient of Thermal Expansion (m/m/°C)	13x 10 ⁻⁶
热导率 Coefficient of Thermal Conductivity W/(m.K)	0.26~0.33
干运行最大速度 Max. PV Dry running (m/s)	0.2

典型应用 Typical Application

起重机臂 —— Crane boom
铲运设备 —— Scraping equipment
滑移装载机 —— Skid steer loader
举升机械 —— Boom lifts ,scissor lifts



Spauldite® FW-1008

纤维缠绕自润滑轴承

Fiber-reinforced self-lubricating bearing

材料介绍 Material Introduction

Spauldite® FW-1008 轴承的自润滑内衬层采用了纤维填充PTFE耐磨带结构，能适合较高的表面速度。轴承的背衬层用连续玻璃纤维增强高强度、耐腐蚀的环氧树脂作为承载层，这种复合物背衬确保了轴承极佳的机械特性，尤其是耐疲劳性能。

Spauldite® FW-1008 The self-lubricating inner lining of the bearing adopts a fibers and PTFE compound tapes tructure, which can be suitable for higher surface speeds. The backing layer of the bearing is made of continuous glass fiber reinforced high-strength, corrosion-resistant epoxy resin as the load-bearing layer. This composite backing ensures excellent mechanical properties of the bearing, especially fatigue resistance.

材料性能 Material Performance

型号 Part Number	FW-1008
颜色 Color	白色~浅绿色 White to Light Green
密度 Density (g/cm³)	1.93
吸水率 Water Absorption Rate (24h) /%	0.13
静态极限负载 Max. Static Load (Mpa)	240
动态极限负载 Max. Dynamic Load (Mpa)	30
温度范围 Temperature Range (°C)	-100~163
热膨胀系数 Coefficient of Thermal Expansion (m/m/°C)	13x 10 ⁻⁶
热导率 Coefficient of Thermal Conductivity W/(m.K)	0.26~0.33
干运行最大速度 Max. PV Dry running (m/s)	0.4

典型应用 Typical Application

球阀、蝶阀轴套 ——
Ball and butterfly trunnion bearing

油压机械导套水利机械轴套 ——
Hydraulic pressure machinery Tie-bar guide bearing

气泵轴套 ——
Air pump guide bushes

