

 江西华杰泰矿纤科技有限公司
JiangXi H&J Mineral Fiber Group

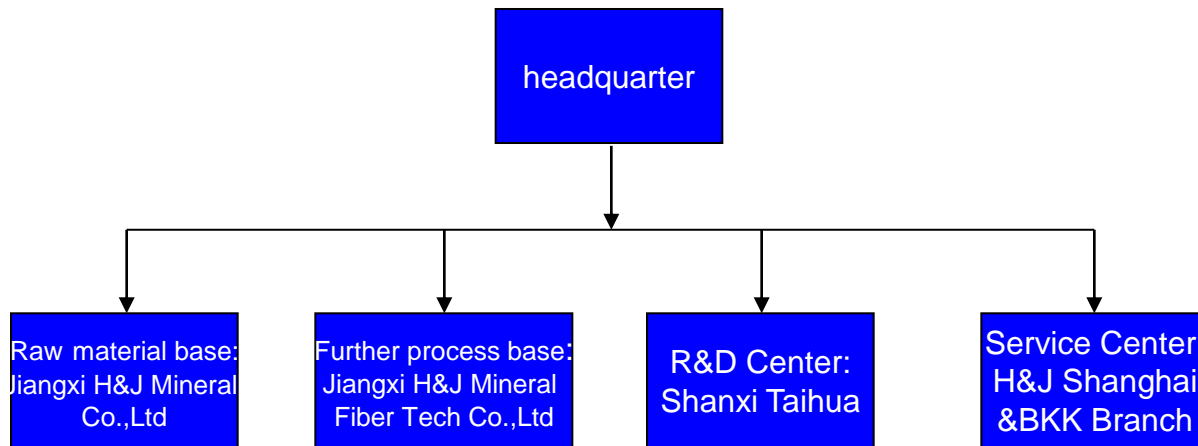
H&J Mineral Fiber

2018/6/5



Profile of our Group

Invested jointly by Chinese entrepreneur and South Africa Eagle International Investment Corporation ,Our group is a high-tech foreign-funded corporation with 60million RMB Yuan fixed assets, being a main undertaker of **China National High-tech support project during period of the “11th-Five-Year” Plan**,we cover such areas as wollastonite mineral fiber R&D and production as well as equipment manufacturing, there are three national—level experts and more than sixty middle and high—level technicians working for the group, which possess 5 subsidiaries including:



Organization Chart

Raw Material Base

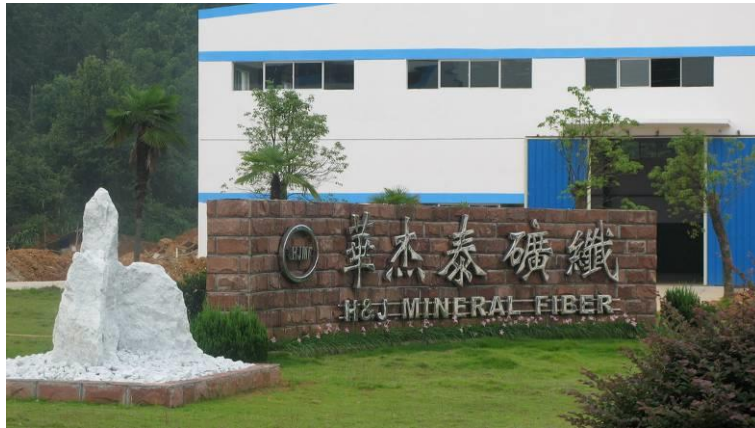
- Raw Material Base -- JiangXi H&J Mineral Co.,Ltd, it possesses a high quality wollastonite mine located in YueGuang mountain of ShangGao county, and covers an area of 0.24 km².it's verified reserves is 4.65 million ton, well-known for its top grade and high wollastonite content .First phase project has been completed with mining capacity of 150,000t/a.



Mining field

Further process base at 1st phase

- Further Process base--JiangXi H&J Mineral Fiber Technology Co.,Ltd, There are three patented Model TH1200 mineral fiber production lines installed in first phase, which is awarded “great innovation prize”by state, having further processing capability of wollastonite for 20 kt annually.



2nd phase

- In order to meet various further demand, especially after we have made breakthrough in NANO-Treatment of wollastonite, Further process capacity has been increased to 40kt/a by completion of 2rd phase, in which we have newly built 4000sqm workshop, newly installed 4 improved TH1000 production line as well as Nano-treat wollastonite devices.



R&D Center

- ❑ Affiliated to Shanxi Taihua Industry & Trade Co.,Ltd, the R&D center was founded in April, 2007, which is mainly engaged in applied and basic research on wollastonite in plastics,
- ❑ The center owns many full-time technicians who carry out research on surface modification of powders for polymer material and mechanical layout separately and employed more than 30 Outsourcing experts and scholars in related fields.



Office



Laboratory

R&D Center — Production Equipment



Modification

Nano-treating



Extruding and Mold

R&D Center——Test Equipment (1)



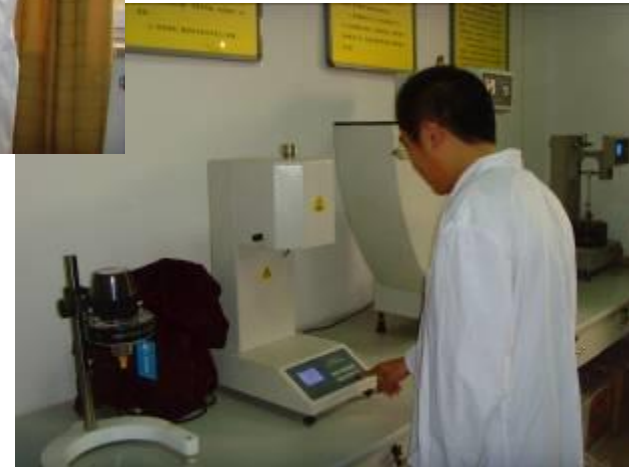
Impact Meter



Universal Tester



Image Analyzer



Melt Indexer

R&D Center——Test Equipment (2)



Blind Roaster
and HDT/VST Tester



Cabinet Dryer



Electronic Balance



Whiteness Meter



Rotary Visco Meter



Abrading Device

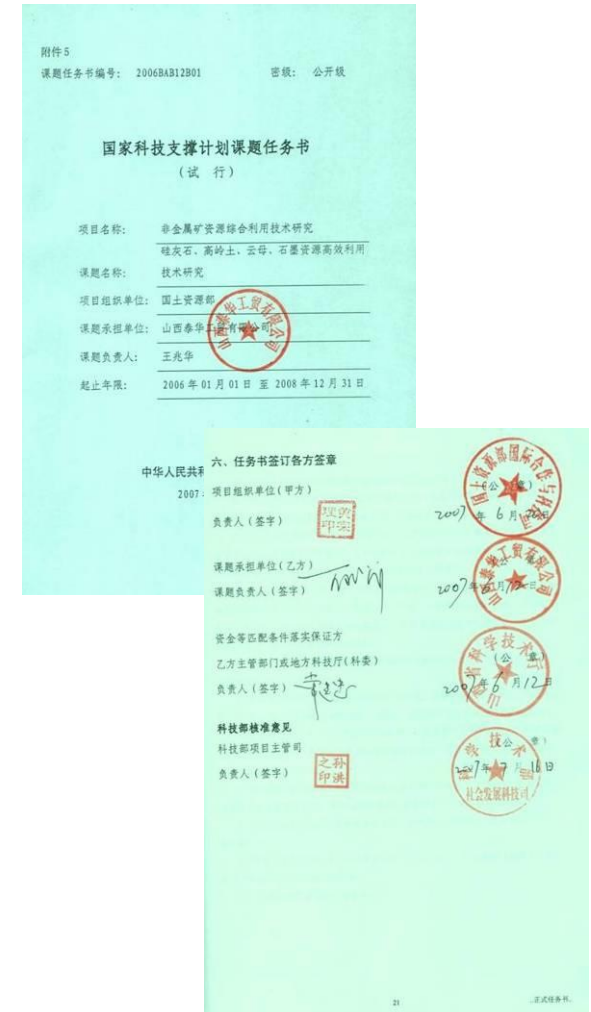
ShangHai and Bangkok Service Center

- Convenience for customer service home and abroad



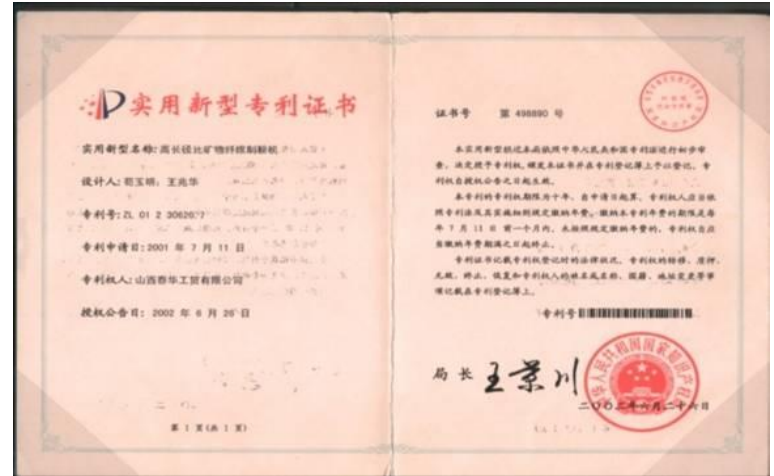
China National High-Tech Support Project in “11th five-year plan”

- Following international tendency, China Land and Resouce Ministry and Science-Technology Ministry jointly launched a key project called “wollastonite high-end development and application” ,one of China National High-Tech Support Project in “11th five-year plan”, aimed at meeting various demand world wide.
- Given the fact that we H&J Mineral Fiber Group has long been on forefront of development, manufacture and application of high quality wollastonite products, the two Ministries directly authorized us to undertake the project, collaborated with well-known China University of Mining &Technology (Beijing) as well as Sinopec Chemical Research Center ,we established Non-metallic Mineral R&D Center and equipped modern devices for further process and analysis of wollastonie-loaded plastic. it is beneficial to all parties and make a good foundation for us to take a new industrialization course.



Achievements we made

- ❑ Great Innovation Equipment
- ❑ Patent:ZL01230620.7
- ❑ Modification patent: 200710139285.7
(application No.)
- ❑ Surface-treat Patent:200710151943.4
(pass through preliminary checkup)



Brief introduction of Wollastonite product

- ❑ Wollastonite (calcium metasilicate, or CaSiO_3) is a naturally occurring white, non-metallic mineral with an acicular or needle-shaped crystal structure.
- ❑ • This distinctive property makes wollastonite an ideal performance mineral for a broad range of industrial and consumer applications.
- ❑ • Acicularity imparts significant strengthening properties and is of considerable importance in wollastonite's diverse market applications.
- ❑ Wollastonite is completely inert and noncarcinogenic with low biodurability, that have made it a recognized substitute for short-fiber asbestos and many man-made fibers.

Application Benefits

- ❑ Cost-effective replacement of milled and chopped glass fiber
- ❑ • Improved heat distortion temperature
- ❑ • Improved surface appearance
- ❑ • Low moisture absorption
- ❑ • Improved thermal conductivity and dimensional stability
- ❑ • Improved surface reflectivity and plateable adhesion with low fogging
- ❑ • Improved mar, scratch and gouge resistance
- ❑ • Lower CLTE
- ❑ • Improved physical and mechanical properties
- ❑ • Non toxic, odorless material

Plastics Applications

- ❑ Front and rear fenders
- ❑ • Front and rear fascias
- ❑ • Rocker panels
- ❑ • Wheel flare
- ❑ • Body side moldings
- ❑ • Fan shroud
- ❑ • Engine cover
- ❑ • Bed liners and flooring products
- ❑ • Interior hard trim
- ❑ • Air in-take manifold
- ❑ • HVAC Panel
- ❑ • Distributor cap
- ❑ • Brake piston
- ❑ • Instrument panel
- ❑ • Interior trim

- Commutators
- Coil tops
- Automotive rear spoiler
- Gelcoats
- Shower stalls and tubs
- Boat hulls
- Circuit boards
- Electrical connectors
- Switch boxes
- Cast urethane and epoxies
- Gaskets
- Cultured marble
- Wood composites
- Decking

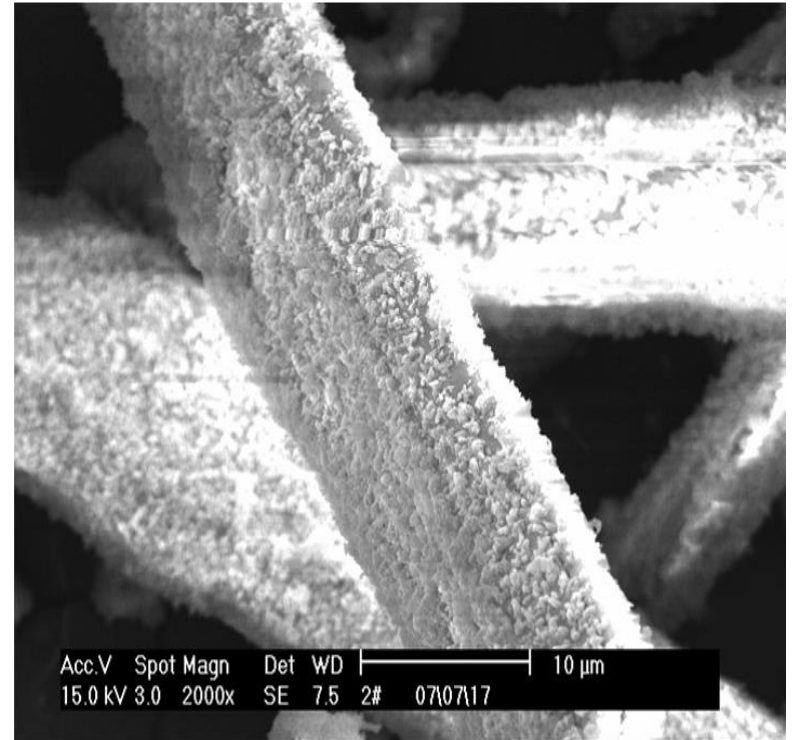
Products

Grades	D50	Aspect Ratio	Feature/Application	Remark
HJFA600	<20	20: 1	Common grade, to fit for filling plastic, non-absorbency, with slight strengthening function	
HJFA800	<15	18: 1	Common grade, to fit for filling plastic, non-absorbency, to be superior to 600	
HJFA1250	10	15: 1	to fit for strengthening plastic, non-absorbency, scratch and mar resistance, to be superior to 800	
HJFA2000	8	10: 1	better strengthening function, can partly replace GF	
HJFA2500	5	7: 1	to fit for products with balanced stiffness and toughness	
HJFA3000	3	5: 1	Improved surface appearance, transparency and better toughness, to be used for car lampshade decoration	

Modified wollastonite may greatly improve mechanical properties .

Nano—treated Wollastonite

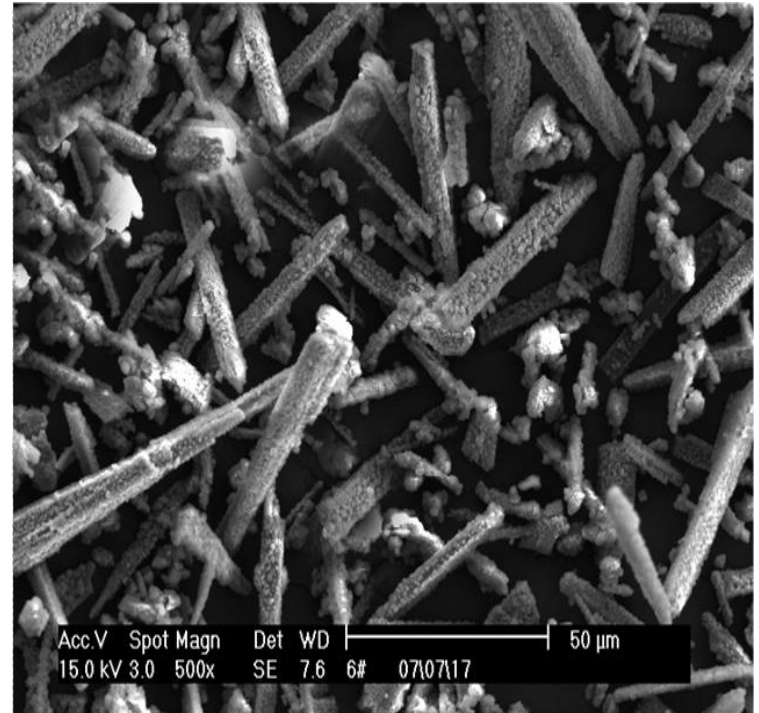
- **Through thorough research and lots of trial and error, we have achieved a significant breakthrough in the field of Nano-treated wollastonite by now. Experiments show that after wollastonite fibers is Nano-treated, surface roughness greatly increases ,sharp edges and angles become smooth, specific surface area increases by more than 3 times, abrasiveness decreases by more than 60%. So performance of wollastonite improve greatly in plastics and paper-making. (paper output was 73 million T in 2007 in China).**



Nano-treated Wollastonite SEM Image

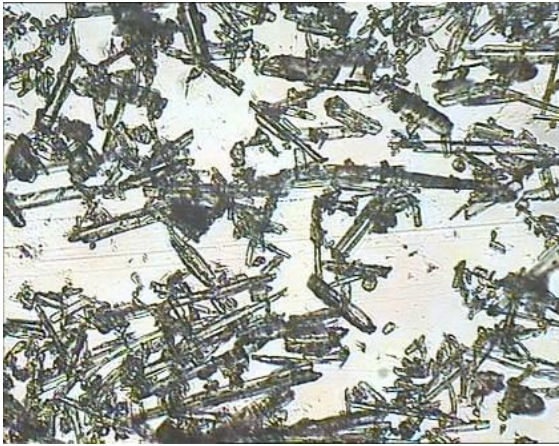
Nano-treated Wollastonite

- ❑ We made many experiments on blending wollastonite coated by various Nano materials respectively in PP, PA6 and PA66.
- ❑ Coating modification is a key research field for us and has obtained proprietary intellectual property rights.
- ❑ Coated wollastonite can greatly improve color stability of modification materials and endue with special features, such as, reducing wearing value and improving flame retardancy.

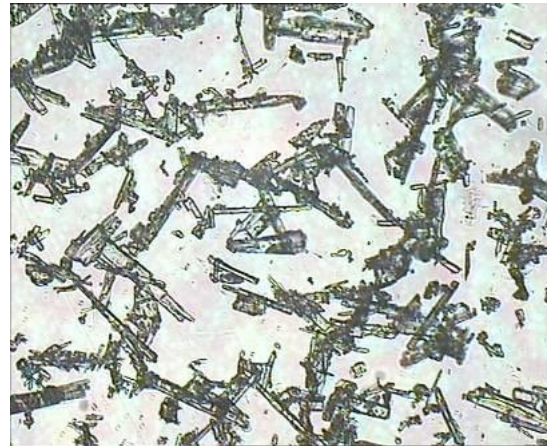


Nano-Coated Wollastonite SEM Image

Comparison of Feeding Method



TH-4



TH-4 side feeding



TH-4 main feeding

Images of PP and 25% of modification wollastonite

- ❑ It is noted that side feeding process is better than main feeding for maintaining aspect ratio.
- ❑ Comparison of two images shows that if selecting suitable process, after composites were extruded, palletized and molded, wollastonite fibers remain fibrous, yet fibrous structure is partially destroyed and aspect ratio becomes small.

Wollastonite Partially Replace GF

- Now an important aspect is replacing GF in plastics, especially in PA. These methods not only lower the cost but also reduce warp and remove the appearance of glass fiber.
- We made many experiments adding long and chopped GF to PP, PA6, PA66 and PBT and obtained lots of data , which built a solid foundation for wollastonite replacing GF in the above materials.

Comparison with Foreign Company (NYCO) — —PP

Number Item	1	2	3	4
Component/PP	TH25	NYCO3000	NYCO3992	NYCO 400
Ash Content/%	30.2	29.5	28.6	31.2
Charpy Impact strength (notched) (kJ/m²)	9.9	8	11.9	7.1
Izod Impact Strength (notched) (kJ/m²)	9.8	7.9	11.2	7.0
Flexural strength/MPa	28.6	34.5	31.7	31.4
Flexural Modulus/MPa	1522	2073	2196	1867
Tensile Strength /MPa	20.4	21.2	20.2	19.8
Elastic Modulus/MPa	1921	2812	2639	2745

- NYCO emphasizes that the main purpose of surface modification wollastonite is to improve its special properties all along, such as, paintable and anti-static.
- In terms of mechanical properties, most of them are similar to each other.

Comparison with Foreign Company (NYCO) ——PBT

	PBT	PBTNYCO30C	PBTTH1630C
Ash Content/%	-	29.52	24.59
Charpy Impact Strength (notched)/ (kJ/m²)	7.36	4.63	4.78
Izod Impact Strength (notched)/(J/m)	67.53	52.53	58.56
Tensile Strength /MPa	44.89	45.93	48.03
Flexural Strength /MPa	65.68	86.68	90.24
Flexural Modulus/MPa	1960.62	3472.62	4026.75
Elastic Modulus/MPa	1328.5	3095.68	3518.97

□ These products are mainly used to car lighting materials,

Comparison with Foreign Company (VANDERBILT)

— — PA

	PA6TH16 30%	PA6W40 30%	PA6W50 30 %	PA6HR1500 30 %	PA6HR2000 30 %
Charpy Impact Strength (notched) (kJ/m²)	6.97	6.58	4.8	6.85	6.06
Tensile Strength /MPa	73.5	76	70	78	75
Flexural Strength /MPa	104	108	104	107	105
Flexural Modulus/MPa	3451	3348	3002	3208	3007
Elastic Modulus/MPa	2729	2502	2346	2450	2371

- VANDERBILT only produced modification wollastonite materials in PA. (in the table above, HR has high aspect ratio and W has low aspect ratio)
- compare with mechanical properties, its products are roughly equivalent to ours.

Comparison of Wollastonite with GF—PP

	20%GF	5%TH14 +15%GF	5%TH1250 +15%GF
Ash Content/%	22.5	22.3	23.3
Charpy Impact Strength (notched)/ (kJ/m²)	12.9	9.8	8.3
Izod Impact Strength (notched)/ (kJ/m²)	13.7	9.5	7.7
Tensile Strength /MPa	49	44	45
Flexural Strength /MPa	70	60	62
Flexural Modulus/MPa	2558	2463	2721
Elastic Modulus/MPa	2981	2350	2302
HDT/°C	154	149	149

□ Wollastonite fibers were modified and produced by our company ; GF is long;

Comparison of Wollastonite with GF—PP

- Results show that under conditions of the same content, GF is obviously superior to wollastonite in reinforcing effect and particle size and aspect ratio of wollastonite have a big influence on mechanical properties: the bigger the two are, the more reinforcing effect is evident ,meanwhile the less toughness it becomes.

Comparison of Wollastonite with GF—PA

	40%GF	40%TH33	15%TH33 +25%GF
Ash Content/%	38.8	38.3	39.7
Charpy Impact Strength (notched)/ (kJ/m²)	8.9	3.9	12.7
Izod Impact Strength (notched)/ (J/m)	127	41.6	145.5
Tensile Strength /MPa	162	40	107
Flexural Strength /MPa	241	93.5	164.8
Flexural Modulus/MPa	7961	3732	6355
Elastic Modulus/MPa	4851	3228	4153

□ Wollastonite fibers were modified and produced by our company ; GF is chopped;

Comparison of Wollastonite with GF—PA

- Results show that under conditions of the same content, only GF reinforcing PA composite is obviously superior to wollastonite composite in properties, while GF and wollastonite jointly reinforcing PA composite is obviously superior to mono-filler in impact strength;
- conclusion: Because wollastonite is of microscopic fibrous structure, it is inferior to GF in reinforcing effect.

Comparison of Wollastonite with Talc—PP

	TH37 20%	TLC1250 20%	TLC3000 20%
Ash Content/%	18.3	23	18.4
Charpy Impact Strength (notched)/ (kJ/m²)	9.12	7.52	7.43
Izod Impact Strength (notched)/ (J/m)	102.6	82.8	94.7
Tensile Strength /MPa	32.6	33.5	38.3
Flexural Strength /MPa	21.9	20.9	23.4
Flexural Modulus/MPa	1998	1474	1455
Elastic Modulus/MPa	1718	1512	1852

- ❑ Wollastonite fibers were modified and produced by our company ; talc has two kinds of mesh 1250 and mesh 3000. Both of contents are 20%;
- ❑ Results show that under conditions of the same content, wollastonite/PP composite is obviously superior to talc/PP in mechanical properties;

Comparison of Reinforced PP

	TH3710 20 (Wollastonite10% &GF20%)	HS125010DBX20 (Talc10%&GF20 %)	HS300010DBX20 (Talc10%&GF20 %)
Ash Content/%	29.5	28	30
Charpy Impact Strength (notched)/ (kJ/m²)	10.3	9.4	9.5
Izod Impact Strength (notched)/ (J/m)	118.1	109.7	104.2
Tensile Strength /MPa	54.7	49.8	53.2
Flexural Strength /MPa	80.6	75.8	82.6
Flexural Modulus/MPa	3926	3273	3908
Elastic Modulus/MPa	3128	2795	3481

□ Wollastonite fibers were modified and produced by our company; talc has two kinds of mesh

1250 and mesh 3000;

Comparison of Reinforced PP

- ❑ Results show that under conditions of the same content, blending effect of wollastonite and GF is obviously superior to that of talc and GF;
- ❑ conclusion: because of fibrous structure of wollastonite and GF, the two have better blending effect than talc.

Comparison between HJMF and talcum loading in plastic PP

item	1	2	3	
Loading Dosage	30%HJFA2000A	30%HJFA2000B	30%talcum	
Ash after ignition/%	28.08	28.51	29.72	
Impact strength (kJ/m ²) Charpy	9.04	8.99	6.67	
Impact strength (KJ/m ²) Izod	91.38	97.5	81.88	
Flexural strength /MPa	35.02	33.62	34.23	
Flexural modulus /MPa	2143.81	1970.9	1905.33	
Tensile strength /MPa	19.52	18.36	20.79	
elastic modulus /MPa	1710.2	1723.85	1468.82	
Moulding shrinkage/ %	Disc specimen ,parallel to flow	0.60	0.65	0.59
	Disc specimen ,vertical to flow	1.04	1.03	1.03
	3.2mm thick rectangle specimen	0.75	0.76	0.70

Test Reports from Authorities —— Mar and Scratch Resistance

- The report was provided from Sinopec Beijing Chemical Technology Academe. The property test was conducted according to enterprise standard of Volkswagen ;
- The three samples were processed by respectively blending and extruding GF, wollastonite and talc with PP;
- Result shows that wollastonite and PP composite has better mar and scratch resistance and may be applied in car interior and exterior fascias.


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 传真: (010)64224001
 网址: www.bicti.ac.cn

耐划伤性能测试结果					
样品名称		改性聚丙烯	测试标准	参考德国大众企业标准	
样品颜色		白色	测试设备	划痕仪	Erichson 公司 430P-L
制样方法		注塑成型		无变计	柯尼卡美能达 CM-2500C
序号	名称	测试结果			
		ΔL	ΔE	表面外观	备注
1	NGC-1	6.15	10.44	划痕表面平整	
2	NGC-2	6.83	14.37	划痕表面平整	
3	NGC-3	8.85	6.89	表面粗糙, 划痕有毛刺	
说 明		1. 测试样品为改性聚丙烯材料, 聚丙烯树脂为扬子石化生产的 Z540; NGC-1 为添加 30% 山南华杰泰矿纤科技有限公司生产的 2000 目样品; NGC-2 为添加 30% 滑石粉 (2000 目) 样品; NGC-3 为添加 30% 3000 目测试样品; 2. ΔL、ΔE 数值为受试样品进行划痕前后的色差和总色差值; 3. 本测试结果仅供参考。			
测试人员		刘清		测试日期	2008.10.09

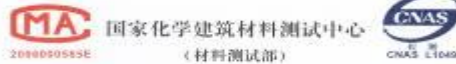
Test Reports from Authorities — — Gloss Property



检 验 报 告

报告编号: 2008-10-229
 样品名称: 改性 PP
 委托单位: 江西华杰泰矿纤科技有限公司
 检验类别: 委托检验

国家化学建筑材料测试中心



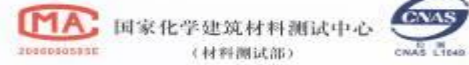
检 验 报 告

报告编号: 2008-10-229 共 2 页 第 1 页

委托单位	江西华杰泰矿纤科技有限公司	检验类别	委托检验
生产单位	/	生产日期	/
样品名称	改性 PP	注册商标	/
样品规格	/	样品名称及规格	/
抽样基数	/	样品编号	详见第 2 页
抽样数量	/	产志编号	/
抽样地点	/	委托日期	2008.10.09
送样单位	/	抽样日期	/

检验结论: 按样品规格用委托单位要求的检验项目及相应的国家标准进行检验, 检验结果详见第 2 页。

备注: /



检 验 报 告

报告编号: 2008-10-229 共 2 页 第 2 页

序号	检验项目	单位	检验结果	检验方法
样品编号: G1				
1	光泽度 (60°)	光泽单位	73.6	GB/T 8007-1988
样品编号: G2				
1	光泽度 (60°)	光泽单位	45.1	GB/T 8007-1988
样品编号: G3				
1	光泽度 (60°)	光泽单位	56.9	GB/T 8007-1988
样品编号: G4				
1	光泽度 (60°)	光泽单位	63.8	GB/T 8007-1988

2. 以下为委托单位提供的信息:
 G1 为 PP (E340) 树脂;
 G2 为添加江西华杰泰矿纤科技有限公司硅灰石矿纤样品;
 G3 为添加滑石粉样品;
 G4 为添加玻璃纤维样品。

主控: 刘钢 俞峰

- ❑ The report is issued by National Chemical Construction Material Center;
- ❑ The four samples include PP and GF, wollastonite and talc respectively blending and extruding with PP ;
- ❑ Result shows that wollastonite and PP composite has better mat property and may be applied in car interior fascias.

Test Reports from Authorities —— Dielectric Strength



- ❑ The report is issued by National Chemical Construction Material Center;
- ❑ The four samples include PA6 and GF, wollastonite and talc respectively blending and extruding with PA6;
- ❑ Result shows that wollastonite and PA6 composite has better dielectric strength and is fit for application in insulation



Test Reports from Authorities —— Modified PP Mechanical Properties



- ❑ The report is issued by Shanxi Plastic Product Quality Supervision and Inspection Station;
- ❑ The specimens were injection molded after extruding mixture of 80% PP and 20% wollastonite

Test Reports from Authorities — — Modified PA66 Mechanical Properties





 编号: WJC200811014

检 测 报 告

产品名称: 填充石改性 PA66
 委托单位: 山西聚华工贸有限公司
 检测类别: 委托检测

山西省塑料产品质量监督检验站
 报告日期: 2008年11月17日
 地址: 太原市晋源区晋源街15号



山西省塑料产品质量监督检验站
 检 测 报 告
 编号: WJC200811014 共 2 页 第 1 页

产品名称	填充石改性 PA66	规格型号	/
委托单位	山西聚华工贸有限公司	检测类别	委托检测
受托单位	山西聚华工贸有限公司	商 标	/
生产单位	山西聚华工贸有限公司	样品编号	2008-11-013
检测环境	温度 23℃, 湿度 50%	抽样基数	/
检测依据	委托要求	送样数量	各 6 条
样品特性及状态	外观正常	产品批号	/
主要仪器	CMT3004 微机控制电子万能试验机 XRW-3000H 热变形维卡软化点温度测定仪	送样日期	2008.11.11
		到样日期	2008.11.11
备 注	根据委托要求, 对填充石改性 PA66 样品进行了检测, 检测结果, 该样品所检项目均符合委托要求。  检测日期: 2008年11月14日 检测员: 王亚建 刘忠志 审核: 王亚建 刘忠志 报告日期: 2008年11月17日		



山西省塑料产品质量监督检验站
 检 测 报 告 (续页)
 编号: WJC200811014 共 2 页 第 2 页

序号	检测项目	单位	标准规定	检测结果	单项结论
1	拉伸强度	MPa	≥130	128	合格
2	弯曲强度	MPa	≥160	218	合格
3	缺口冲击强度	KJ/M ²	≥6	12	合格
4	热变形温度	℃	≥168	234	合格
以下空白					
送样人: 高博					

- ❑ The report is issued by Shanxi Plastic Product Quality Supervision and Inspection Station;
- ❑ The specimens were injection molded after extruding mixture of 80% PA66 and 20% wollastonite;
- ❑ Result shows that the technical data of wollastonite and PA66 composite totally meet the needs of National Project of the 11th 5-year Plan

THANK YOU