

## Straw based 3D Printer Filament will Cost Half the Price of PLA

Source: 3D printer and 3D printing news

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PLA (polylactic acid) is kinder to the environment than other plastics as it is derived from corn stalks and not fossil fuels. Now a Chinese company has invented another eco-friendly material - straw based plastic - made from rice and wheat stalks and can be used in 3D printing, without sacrificing price or performance. The straw based plastic is made from dried crops straw, such as wheat straw, rice straw, corn stalk etc, mixed with plastic and plastic additives, using company's patent pending technology.



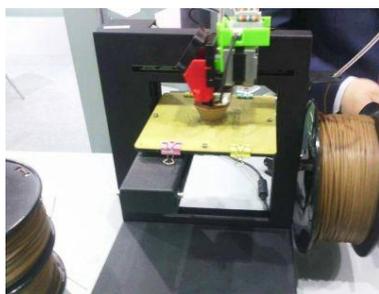
Every year large amount of straw are generated from the production of crop plants such as wheat, rice, and cotton. In the past most of this biomass was burned resulting in air pollution and loss of a potential carbon feedstock for improving soil fertility. Due to these problems, straw burning in the field has been banned by the government.

Chinese company, Jiangsu Jinghe Hi-Tech Co.,Ltd, has developed a technology that can transfer crops straw into 3D printing material. The process started with shredding the straw to 1.5~2mm pieces. Then they mix the strawdust with polypropylene, adding silane coupling agent and ethylene bis(stearamide) as additives. The mixture is then extruded into granules using a twin screw extruder. After the transforming, the granules have even particle size and are more stable for further processing.

The plastic granules can be heated up to 160~180° C for injection moulding. Using special filament extruders the company has turned these plastic granules into filament for 3D printers. The 3D printed object created using the straw based filament has the color of natural wood, and the texture of plant fiber on the surface. It has also nice surface finish and high strength.



According to Yan Wei, deputy general manager of Jinghe, the company has signed several cooperation agreement with villages in the area. In general, 1 ton of rice paddy produces 290 kg rice straw, currently the company pays the price of approximately 800-1000 RMB (\$120~160) per ton for crops straw. Yan said this project has been supported by farmers. "This is a good way to get rid of straw wastes from our crops and still earn some income," said Mr. Pu, a local farmer.



Compared with traditional petroleum-based plastic, Jinghe's straw-based plastic has low production cost and fewer carbon emissions. According to the company, producing 14,000 tons of the straw-based plastic can reduce carbon dioxide emissions by 22,400 tons every year.

The ABS raw material costs around 15,000 RMB (\$2,400) per ton in the market. PLA, as a natural green material, has more complex production process and costs more, around 20,000 RMB (\$3200). Yan said their straw-based plastic material only costs about 10,000 RMB (\$1,600) per ton. After processing, the price of straw based filament for 3D printing will be only half of the current PLA filament price.



If the material can plummet in price, it will be sooner for 3D printers to be in every home, Yan said. Currently the company can process around 7,000 tons of straw annually. Jinghe has already signed a 2 billion RMB (\$320K) contract with Shantou city government to provide straw based plastics for producing toys for European market.

## New report says Global Biodegradable Packaging Market to grow at 18.05% CAGR to 2019

Source: Bioplastics Magazine, NatureWorks

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Packaging is one of the largest industry sectors in the world, worth several billions. Biodegradable packaging represents a meager percentage of this colossal market. The global biodegradable packaging industry has seen a shift in paradigm and has now moved towards efficient and advanced packaging.

But recently, biodegradable packaging has quickly become an essential part of the global packaging market aiding to the ever-increasing consumer awareness and importance of eco-friendly substitutes. Major manufacturers of packaging are now looking to differentiate their products from those of their competitors by providing best possible biodegradable packaging products as per consumer demands. The demand for biodegradable packaging is increasing and will continue to increase as the companies utilize packaging like a medium to protect and promote the safety of the environment along with their products.

In fact, a newly published research report at [RnRMarketResearch.com](http://RnRMarketResearch.com) is now predicting that this market will grow at 18.05% CAGR to 2019 - a considerable about-turn from about a decade ago, when biodegradable packaging market was not considered to be one of any real significance. The report, "Biodegradable Packaging Market by Packaging Type (Plastic and Paper), by Applications (Food Packaging, Beverage Packaging, Pharmaceuticals Packaging, Personal & Home Care Packaging, and Others), and by Geography (North America, Europe, Asia-Pacific, and ROW) – Global Trends & Forecast to 2019", defines and segments the global biodegradable packaging market with an analysis and forecast for biodegradable plastic and paper packaging by types, applications, and geography by value as well as volume.

The global biodegradable plastic packaging market is expected to grow at a CAGR of 18.05% from 2013 to 2019 to reach a value of \$8,415.20million. Due to increasing degree of consumer awareness, and generic and contract manufacturing activities in Europe and North America, the developed geographies are expected to register maximum growth. Countrywise, the U.S. is the top consumer of biodegradable packaging product globally, and is also the largest market growing at a CAGR lower than the global average till 2019. Member countries of EU, Sweden, Switzerland, U.K., and Germany are the key markets in European biodegradable packaging market and constitute majority of the market size.

While food packaging takes the topmost position in the biodegradable packaging market, with more than 70% share by value of biodegradable plastic packaging and more than 40% share by value of biodegradable paper packaging, maximum growth in the future is expected from the beverage packaging application segment. Plastics and polymers are the largest consumed raw material for the beverage packaging products and are being fast replaced by their biodegradable substitutes such as PLA, starch-based Plastics, PHA, and so on due to its ease in design, excellent barriers properties, and cost-effectiveness.

The biodegradable packaging market is expected to witness fastest growth from biodegradable plastic packaging market, as it is a relatively new market with a great potential to capture existing market share from non degradable conventional plastic packaging. Lack of interest of governments of many developed regions to provide incentives to promote the use of biodegradable packaging and price difference in conventional versus biodegradable packaging materials are primary factors curbing the growth of this market. Acquisitions as the major growth strategy used in the recent past have indicated that the industry is on its way to consolidation globally and global packaging suppliers are strengthening their presence in emerging markets.

## Chinese Mining Firm Jinhui Launches Bioplastic Factory

Source: PLASTICS NEWS CHINA

Posted: April 21, 2014



Chinese coal mining company Shanxi Jinhui Energy Group Co. Ltd. is diversifying into bioplastics, launching production this month on a \$35 million, 20,000-metric-ton factory for bio-based polybutylene adipate co-terephthalate. The \$2.4 billion company, based in Taiyuan, Shanxi Province, disclosed the investment at an April 21 press conference in Shanghai ahead of the Chinaplas trade show. It said that the factory, in Xiaoyi, Shanxi, initially will focus on exports. But in spite of PBAT's relatively high cost, the company also sees long-term opportunities within China, for products such as agricultural mulch film, shopping bags and disposable lunch boxes and cups.

The facility will likely produce about 10,000 metric tons of PBAT this year, with 70 percent of that directly exported, mostly to Europe and South Korea, said Janice Li, president of Jinhui Zhaolong High Technology Co. Ltd., the Jinhui subsidiary building the PBAT factory. The remaining PBAT will be mixed with other materials,

such as polylactic acid, starch or a carbon-dioxide polymer that the firm also is commercializing, to provide lower-cost options for biodegradability, company officials said. Jinhui claims it's the largest-capacity PBAT factory in Asia. Li said the market is looking for policy support from China's government to help push biodegradable polymers. "We need strong support from the government," she said. "Government policies for environmental protection have existed for many years but the results are not very significant." Biodegradable polymers face a hurdle because they can cost two to four times that of traditional petrochemical plastics, but the petrochemical plastics can be more expensive to dispose of, a cost that is paid by society, said Li, who also is a vice president of Jinhui Group.

A petrochemical plastics bag, for example, can cost five times as much to get rid of at the end of its life than to manufacture, Li claimed.

In 2008, China banned free plastic bags more than 0.025 mm thick. Li called that a good step toward building support for biodegradable products, and combined with other policy statements from the government, points to strong interest in lower-carbon consumption. But she said efforts have been hampered by lack of enforcement. "Due to a lack of punitive measures and no substitute products, the non-degradable plastic bags are still widely used in China despite repeated prohibitions," she said. Jinhui said the company's PBAT material can decompose completely into carbon dioxide and water within 180 days in a composting environment, complying with the American ASTM 6400 and European Union EN 13432 standards for biodegradation. Its PBAT also has approval for food-contact applications from the U.S. Food and Drug Administration, she said.



The company is also considering building a PVC manufacturing facility in Xinjiang Province in several years, and is looking at building a facility to make carbon-dioxide-based polymers, using technology from a partner company, Henan Tianguan Co. in Zhengzhou, Henan Province, she said.

Jinhui Group derives about 50 percent of its roughly 15 billion Chinese yuan (\$2.4 billion) in annual revenues from coal mining, Li said. It employs about 7,500 people, and also has investments in real estate.

## UK's LifeCycle Products to use Cardia Bioplastics Resins

Source: : Bioplastics Magazine

Posted: April 15, 2014



UK's LifeCycle Products selects Cardia Bioplastics as partner to develop its proprietary bag and waste management products for the UK market. Cardia Bioplastics Limited announced on April 15, 2014 that it partnered with LifeCycle Products to increase sales of compostable and Biohybrid™ bag and waste management products in the UK market.

LifeCycle Products is a UK designer, marketer and distributor of proprietary compostable and lower carbon foot print bag and waste management products. LifeCycle Products and Cardia Bioplastics executed their strategic supply contract. Initial orders of \$65,000 for Cardia Compostable products have been placed by LifeCycle Products for its mid-year launch.

The UK market presents an excellent opportunity for both Cardia Compostable and Biohybrid™ bag and waste management products. Some 8.1 billion thin-gauge (single-use) plastic bags were used by UK supermarket customers in 2012, an increase of 1.3% from 2011, according to the latest data from the Waste and Resources Action Programme (WRAP).

LifeCycle Products Managing Director, Mark Sommers said, "LifeCycle Products is committed to increasing use of compostable bags and waste management products within the UK market. Use of Bioplastics products throughout the UK by retailers, consumers and as waste management products has great capacity for growth." Mark continues, "The technical performance and environmental integrity of our products is paramount and at the core of our business – Cardia Bioplastics technology exceeds the high standards we've set. We are therefore delighted to have secured a strategic supply agreement with Cardia for our UK markets. We look forward to a long-term relationship with Cardia."

LifeCycle Products, Products Director Richard James said, "We are designing, developing and manufacturing high quality, functional products. Cardia Compostable was the perfect choice for superior quality materials to ensure performance and compostability in our products." He went on to say that "We are now seeing a real shift in quality expectations for certified compostable products in the UK market, particularly in the bags & bin liner sector for food waste. Poor quality products have had their day and demand for quality, fit for purpose products is increasing, with Cardia Compostable, we believe that LifeCycle Products' bags and liners are poised to lead the market in the UK."

LifeCycle Products is also the first in the UK to offer a solution for those customers needing to begin the step change towards bio-based materials. The Company is now introducing products based on Cardia Biohybrid™ technology as an alternative to conventional 100% petro based materials. This is gaining significant interest in the Municipal and Trade Waste sacks market. LifeCycle Products first Biohybrid™ offering will be GreeneBag Biohybrid™ sacks that are a quality sustainable replacement of conventional Polyethylene types that are 100% recyclable, offer a lower carbon footprint, are made with renewable resources, contain no heavy metals and are competitively priced.

Dr Frank Glatz, Cardia Bioplastics Managing Director said, "The UK market presents an excellent growth opportunity for Cardia Bioplastics and we are very excited about developing a new distribution channel through our relationship with an innovative company such as LifeCycle Products. Both our fully certified Cardia Compostable bags and waste management products as well as our proprietary Biohybrid™ technology is ideal for the UK market and we look forward to working with LifeCycle Products to capture market share. We are continuing to see increased demand globally for our resins, films and finished products." (MT)