

XRequest for Information (RFI) DE-FOA-0001615: Cellulosic Sugar and Lignin Production Capabilities

Description: The U.S. Department of Energy (DOE) seeks input from industry, academia, national laboratories and other biofuels and bioproducts stakeholders to identify existing capabilities to produce lignocellulosic sugars and lignin for use by the research community.

Purpose: The purpose of this RFI is to develop a comprehensive list of suppliers who are willing and able to produce and sell cellulosic sugar and/or lignin for use by the research community.

Request for Information Response Guidelines

Responses to this RFI must be submitted electronically to **sugarandlignin@ee.doe.gov** no later than 5:00pm (ET) on August 24, 2016. Responses must be provided as attachments to an email. It is recommended that attachments with file sizes exceeding 25MB be compressed (i.e., zipped) to ensure message delivery. Responses must be provided as a Microsoft Word (.docx) attachment to the email, and no more than 5 pages in length, 12 point font, 1 inch margins.

Request for Information Categories and Questions

- Company / institution name: FPInnovations**
- Company / institution contact: Kirsten Maki**
- Contact's address, phone number, and e-mail address:**

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Category 2: Lignin

BETO is interested in information related to all types of lignin available to the research community to provide the most comprehensive set of data.

You may respond to as many or as few questions as you wish. **BETO is requesting NON-PROPRIETARY information only.**

FOR KRAFT LIGNIN

Question 1: To which types of research entities are you willing and able to sell or otherwise provide your lignin? (e.g., university researchers, national laboratories, industry/private sector)? Are there any types of research entities to whom you are not willing and able to sell your lignin?

- Samples available to partners on a case by case basis, with a Material Transfer Agreement

Question 2: What are the maximum and minimum quantities of lignin that you are willing and able to sell (kg)?

- Any size sample up to multiple tonnes available

Question 3: In what units do you sell your lignin and is it packaged (e.g., super sacks), or sold in bulk?

- Flexible / depends on quantity, smaller samples in boxes or pails, larger samples in palletted bulk bins (~1 cubic meter size), or super sacks

Question 4: How do you ship lignin?

- Conventional courier or postal service for small samples, freight company for larger samples

Question 5: What is the lignin concentration in your product?

- >90% lignin

Question 6: What type(s) of biomass do you use in your process?

- North American softwood and hardwood species (primarily pine/spruce or aspen)

Question 7: What process do you use that produces lignin (dilute acid, ammonium fiber expansion (AFEX), hot water, organosolv, etc.)?

- LignoForce – precipitation from kraft black liquor by CO₂ acidification after oxidation; followed by washing with sulfuric acid

Question 8: What details of the scale of your process are you willing to share (e.g. batch and/or continuous or volumetric productivity)?

- Softwood lignin available from commercial scale operation / multiple tonnes per day, or in pilot scale quantities up to 100 kg per day; hardwood lignin available in pilot quantities only (up to ~100 kg/day)

Question 9: Do you measure the typical composition of your lignin? If so, what method do you use? How consistent is the composition of your lignin?

- Quality of lignin produced with the same parameters is quite consistent; variations are possible based on process parameters selected

Question 10: Do you routinely test your lignin for consistency within and between lots?

Question 11: What impurities are present in your lignin and what testing do you perform to determine the presence of impurities?

- Ash content is primary test for purity; typically <1%

Question 12: Does your process include a purification or filtration step?

- yes

Question 13: What is the typical concentration in g/L you can provide?

Question 14: Have you examined the impacts of transport and storage on lignin? If so, can you please provide any relevant (non-proprietary) details of these impacts?

Question 15: What additional information are you willing and able to provide to the research community about the lignin? Please provide any non-proprietary cost information you are willing to share.

- LignoForce kraft lignin has minimal odour compared to other kraft lignins

Question 16: Into what markets do you typically sell your lignin? What is a typical application for your lignin?

- PF resin for plywood is one proven commercial application; many others are under development