



Sappi North America

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Subject: Response to “Request for Information (RFI) DE-FOA-0001615: Cellulosic Sugars and Lignin Production Capabilities”

Company: Sappi North America

Company Contact:

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Category 1 Questions: Lignocellulosic Sugars

- 1) To which types of research entities are you willing and able to sell your lignocellulosic sugar (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 lignocellulosic sugar?

A demonstration unit to extract cellulosic sugar would be prepared to ship samples by March 2017 to any research institute. The samples will be sugar rich pre-hydrolysis liquor. There are no known research entities to which we would be unwilling to sell our sugars.

- 2) What are the maximum and minimum quantities of lignocellulosic sugar you are willing and able to sell (kg)?

The quantities of sugar rich pre-hydrolysis liquor can range from liters to bulk quantities of 100's of liters.

- 3) What is the sugar concentration in your product?

The pre-hydrolysis liquor contains 3 to 5% dry solids, and the sugar content is typically 50 to 60% of the total dry solids.

- 4) What physical form do you sell your sugars (e.g., solid or liquid)?

Pre-hydrolysis liquor samples (liquid) are available.

5) How do you package your lignocellulosic sugars for shipping? Do you ship in bulk?

Pre-hydrolysis liquor samples are normally packaged in bottles for smaller samples. We have not shipped bulk samples yet, but would be willing to consider based on a case-to-case basis.

6) What type(s) of biomass do you use to produce lignocellulosic sugar?

Hardwood species, including Eucalyptus, Aspen and Maple

7) What process do you use to produce lignocellulosic sugar?

The pre-hydrolysis kraft process

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

The pre-hydrolysis process for sugars is a DEMO scale batch process, producing approx. 6-8 cubic meters of Pre-hydrolysis liquor which is the source of the sugars.

9) What is the typical composition of your sugar stream (e.g., glucose, galactose, mannose, xylose, arabinose) and what is the purity?

The majority of the sugars are oligomeric xylose, followed by smaller quantities of other C5 and C6 sugars, e.g. arabinose, galactose and glucose.

10) Do you routinely test your cellulosic sugar for consistency within and between lots and between feedstocks (if applicable)?

We have tested pilot scale samples on a regular basis, as well as samples from our industrial plants.

11) What impurities are present in your lignocellulosic sugar process and what testing do you perform to determine the presence of impurities?

Impurities include lignin, inorganics, organic acids and sugar breakdown products. We use HPLC methods to quantify the organic acids, sugar and sugar breakdown products. UV methods are used to quantify the lignin in the sample.

12) Does your process include a purification step?

Currently no; these processes are in development

13) What is the highest concentration in grams/Liter you can provide?

The highest sugar concentration would be ~25 g/L (dependent on solids content).

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

Pre-hydrolysis samples are relatively stable when refrigerated over prolonged periods of time (~3 months). Some degradation is noticed over a 3 months period if the samples are not refrigerated.

16) Into what markets do you typically sell your lignocellulosic sugar? What is a typical application for your lignocellulosic sugar?

No commercial sales currently, target applications include typical biochemicals

Kind regards,



Beth A. Cormier
Sappi North America