

PATENT ASSIGNMENT

Electronic Version v1.1
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SUBMISSION TYPE:	NEW ASSIGNMENT
NATURE OF CONVEYANCE:	SECURITY AGREEMENT
CONVEYING PARTY DATA	
Name	Execution Date
FIBERIGHT, LLC	10/06/2011
RECEIVING PARTY DATA	
Name:	Novozymes A/S
Street Address:	77 Perry Chapel Church Road
City:	Franklinton
State/Country:	NORTH CAROLINA
Postal Code:	27525
PROPERTY NUMBERS Total: 2	
Property Type	Number
Patent Number:	7758719
Application Number:	12839655
CORRESPONDENCE DATA	
Fax Number:	7043533692
<i>Correspondence will be sent via US Mail when the fax attempt is unsuccessful.</i>	
Phone:	7043317400
Email:	cindy.owens@kigates.com
Correspondent Name:	Karl S. Sawyer, Jr.
Address Line 1:	214 North Tryon Street
Address Line 2:	Hearst Tower, 47th Floor
Address Line 4:	Charlotte, NORTH CAROLINA 28202
ATTORNEY DOCKET NUMBER:	2915045.00159
NAME OF SUBMITTER:	Karl S. Sawyer, Jr.
Total Attachments: 15 source=SecurityA#page1.tif source=SecurityA#page2.tif	

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SECURITY AGREEMENT

This SECURITY AGREEMENT (the "Security Agreement" or "Agreement") is made and entered into as of October 6th, 2011, by and between FIBERIGHT, a Delaware limited liability company ("Borrower"), and NOVOZYMES A/S, a company organized under the laws of Denmark ("Lender").

WITNESSETH:

WHEREAS, Lender has agreed to make a loan to Borrower pursuant to that certain Funding Agreement, dated as of the date hereof, between Borrower and Lender (as amended, modified or supplemented from time to time, the "Funding Agreement"); and

WHEREAS, Borrower wishes to secure all indebtedness, liabilities, and obligations of Borrower to Lender arising under or pursuant to the Funding Agreement or the Note (as defined in the Funding Agreement), whether now existing or later arising (said obligations are hereinafter collectively referred to as "Obligations").

NOW, THEREFORE, in consideration of the premises and of the mutual covenants and promises herein contained, the parties hereto agree as follows:

1. **Definitions.** All capitalized terms used but not otherwise defined herein shall have the meanings given to such terms in the Funding Agreement.

2. **Grant of Security Interest.** As collateral security for the payment and satisfaction of all Obligations, Borrower hereby grants to Lender a continuing, first-priority security interest in and to all of the Collateral (as defined below). As used herein, "Collateral" means all of Borrower's right, title, and interest in and to the property described on Exhibit A attached hereto.

3. **Financing Statements.** Borrower hereby authorizes Lender to file any and all necessary security agreements, Uniform Commercial Code financing statements, registrations, instruments, and documents prepared by Lender in form and number sufficient for filing wherever required with respect to the Collateral, in order that Lender shall have a duly perfected security interest of record in the Collateral following its filing of such security agreements, financing statements, registrations, instruments and documents with the appropriate governmental authorities, and Borrower shall at any time as reasonably required by Lender execute, authorize or take any other action necessary to allow any additional security agreements, financing statements, registrations, instruments or other documents to be filed to effect the same, together with any necessary continuation statements so long as this Security Agreement remains in effect.

Upon the occurrence and during the continuance of an Event of Default, Borrower does hereby irrevocably make, constitute and appoint Lender and any of its properly designated officers, employees or agents as the true and lawful attorneys of Borrower with power to sign the name of Borrower on any security agreements, financing statements, registrations, instruments or other documents which, in Lender's reasonable opinion, must be filed in order to perfect or

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continue the perfection of the security interests granted in the Collateral and with respect to which Borrower fails to execute after written request of Lender. This power, being coupled with an interest, is irrevocable until all Obligations are finally paid in full.

4. Maintenance of Security Interest. Borrower will, from time to time, upon the request of Lender, deliver specific assignments of Collateral, together with such other instruments and documents, financing statements, amendments thereto, assignments or other writings as Lender may reasonably request to carry out the terms of this Security Agreement or to protect or enforce Lender's security interest in the Collateral. With respect to any and all Collateral to be secured and conveyed under this Security Agreement, Borrower agrees to do and cause to be done all things necessary to perfect and keep in full force the security interest granted in favor of Lender, including, but not limited to, the prompt payment of all fees and expenses incurred in connection with any filings made to perfect a security interest in the Collateral in favor of Lender. Borrower agrees to make appropriate entries upon its books and records disclosing Lender's security interest in the Collateral.

5. Collateral. Borrower covenants with Lender that:

(A) Inspection. Lender (by any of its officers, employees and agents) shall have the right, at any time or times during Borrower's usual business hours and upon reasonable prior notice to Borrower, to inspect the Collateral, all records related thereto (and to make extracts or copies from such records), and the premises upon which any of the Collateral (or any records relating thereto) is located, to discuss Borrower's business with an employee designated by Borrower who is knowledgeable of the financial statements and business of Borrower, any outside auditor of Borrower and, upon or after the occurrence and during the continuance of an Event of Default any other person and to verify the amount, quality, quantity, value and condition of, or any other matter relating to, the Collateral.

(B) Payment of Taxes and Assessments. Borrower will promptly pay, when due, all taxes or assessments levied against any of the Collateral; provided, however, Borrower shall not be required to pay or cause to be paid any such tax or assessment, so long as the validity thereof shall be actively contested in good faith by proper proceedings, any lien arising in connection therewith shall be and remain in all respects inferior to the liens in favor of Lender and, if requested by Lender, reserves with respect thereto acceptable to Lender shall be established and maintained; provided further, that any such tax or assessment shall be paid forthwith upon the commencement of proceedings to foreclose any lien securing the same.

(C) Change of Trade Styles. Borrower shall not change, amend, alter, terminate, or cease using its tradenames or styles under which it sells its services as of the date of this Agreement ("Trade Names"), or use additional Trade Names, unless Lender receives twenty (20) days advance written notice of such change.

(D) Location of Collateral and Borrower's Places of Doing Business. The locations of the Collateral, the location of Borrower's Chief Executive Office and principal place of business and the location of all other places of business of Borrower are described on Exhibit B attached to this Agreement.

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6. General Representations, Warranties and Covenants Regarding Collateral. Borrower represents and warrants that it is and will continue to be the owner of the Collateral, now owned and upon the acquisition of the same, free and clear of all encumbrances and security interests other than the security interest in favor of Lender hereunder, and that it will defend the Collateral and any products and proceeds thereof against all claims and demands of all persons at any time claiming the same or any interest therein adverse to Lender. Borrower agrees that it will not transfer, assign, or otherwise dispose of any Collateral, or any right, title or interest of Borrower therein, without the prior written consent of Lender. Borrower further represents and warrants that the information set forth on Exhibit B attached hereto is accurate and complete in all material respects.

7. Representations, Warranties and Covenants Regarding Intellectual Property Collateral

(A) For the purposes of this Agreement,

(i) "Patents" means collectively, all of the following of Borrower: (a) all patents, rights and interests in patents, patentable inventions and patent applications anywhere in the world, including, without limitation, those listed on Schedule A-1 hereto, (b) all reissues, extensions, continuations (in whole or in part) and renewals of any of the foregoing, (c) all income, royalties, damages or payments now or hereafter due and/or payable under any of the foregoing or with respect to any of the foregoing, including, without limitation, damages or payments for past, present or future infringements of any of the foregoing, (d) the right to sue for past, present and future infringements of any of the foregoing and (e) all rights corresponding to any of the foregoing throughout the world.

(ii) "Trademarks" means collectively, all of the following of Borrower: (a) all trademarks, rights and interests in trademarks, trade names, corporate names, company names, business names, fictitious business names, trade styles, service marks, logos, other business identifiers, prints and labels on which any of the foregoing have appeared or appear, whether registered or unregistered, all registrations and recordings thereof, and all applications in connection therewith (other than each application to register any trademark or service mark prior to the filing under any requirement of law of a verified statement of use for such trademark or service mark) anywhere in the world, including, without limitation, those listed on Schedule A-2 hereto, (b) all reissues, extensions, continuations (in whole or in part) and renewals of any of the foregoing, (c) all income, royalties, damages and payments now or hereafter due and/or payable under any of the foregoing or with respect to any of the foregoing, including, without limitation, damages or payments for past, present or future infringements of any of the foregoing, (d) the right to sue for past, present and future infringements of any of the foregoing and (e) all rights corresponding to any of the foregoing (including the goodwill) throughout the world.

(iii) "Copyrights" means collectively, all of the following of Borrower: (a) all copyrights, rights and interests in copyrights, works protectable by copyright, copyright registrations and copyright applications anywhere in the world, including,

without limitation, those listed on Schedule A-3 hereto, (b) all reissues, extensions, continuations (in whole or in part) and renewals of any of the foregoing, (c) all income, royalties, damages and payments now or hereafter due and/or payable under any of the foregoing or with respect to any of the foregoing, including, without limitation, damages or payments for past, present or future infringements of any of the foregoing, (d) the right to sue for past, present and future infringements of any of the foregoing and (e) all rights corresponding to any of the foregoing throughout the world.

(B) Schedule A-1 correctly sets forth all issued and pending Patents constituting Collateral and material Patent licenses constituting Collateral owned by Borrower in its own name as of the Effective Date. Schedule A-2 correctly sets forth all registered and pending applications for Trademarks and material Trademark licenses constituting Collateral owned by Borrower in its own name as of the Effective Date. Schedule A-3 correctly sets forth all registrations and applications for Copyrights constituting Collateral and material Copyright licenses constituting Collateral owned by Borrower in its own name as of the Effective Date. To the best of Borrower's knowledge, each Patent and Trademark constituting Collateral is valid, subsisting, unexpired and enforceable and has not been abandoned. Except as set forth in any such Schedule, none of such Patents, Trademarks and Copyrights constituting Collateral is the subject of any material licensing or franchise agreement. Other than in the ordinary course of prosecution of Patents constituting Collateral and other intellectual property rights with any Patent or other intellectual property office, no holding, decision or judgment has been rendered by any governmental authority which would limit, cancel or question the validity of any Patent, Trademark or Copyright constituting Collateral. For purposes of the foregoing, "ordinary course of prosecution" does not include any opposition, cancellation, interference, reissue or reexamination proceeding. No action or proceeding is pending (i) seeking to limit, cancel or question the validity of any material Patent, Trademark or Copyright constituting Collateral, or (ii) which, if adversely determined, would have a material adverse effect on the value of any material Patent, Trademark or Copyright constituting Collateral.

(C) Except as could not reasonably be expected to have a material adverse effect on such Intellectual Property, Borrower (i) will continue to use each registered Trademark and Trademark constituting Collateral for which an application is pending, to the extent reasonably necessary to maintain such Trademark in full force free from any claim of abandonment for non-use, (ii) will maintain products and services offered under such Trademark at a level substantially consistent with the quality of such products and services as of the date hereof, (iii) will not (and will not permit any licensee or sublicensee thereof to) do any act or knowingly omit to do any act whereby such Trademark could reasonably be expected to become invalidated or impaired in any way, (iv) will not do any act, or knowingly omit to do any act, whereby any issued Patent owned by Borrower constituting Collateral would reasonably be expected to become forfeited, abandoned or dedicated to the public, (v) will not (and will not permit any licensee or sublicensee thereof to) do any act or knowingly omit to do any act whereby any registered Copyright constituting Collateral owned by Borrower or Copyright constituting Collateral for which an application is pending could reasonably be expected to become invalidated or otherwise impaired and (vi) will not do any act whereby any material portion of the Copyrights constituting Collateral may fall into the public domain.


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(D) Borrower will notify the Lender promptly if it knows, or has reason to know, that any application or registration relating to any material Intellectual Property constituting Collateral owned by Borrower may become forfeited, abandoned or dedicated to the public, or of any adverse determination or development (including, without limitation, the institution of, or any such determination or development in, any proceeding in the United States Patent and Trademark Office, the United States Copyright Office or any court or tribunal in any country) regarding Borrower's ownership of, or the validity of, any material Intellectual Property constituting Collateral owned by Borrower or Borrower's right to register the same or to own and maintain the same.

(E) Whenever Borrower, either by itself or through any agent, employee, licensee or designee, shall file an application for the registration of any Intellectual Property constituting Collateral with the United States Patent and Trademark Office, the United States Copyright Office or any similar office or agency in any other country or any political subdivision thereof, such Borrower shall report such filing to Lender within five (5) Business Days after the last day of the fiscal quarter in which such filing occurs. Upon request of Lender, Borrower shall execute and deliver, and have recorded, any and all agreements, instruments, documents, and papers as Lender may reasonably request to evidence Lender's security interest in any material Copyright, Patent or Trademark constituting Collateral and the goodwill and general intangibles of Borrower relating thereto or represented thereby.

(F) Borrower will take all reasonable and necessary steps, at Borrower's sole cost and expense, including, without limitation, in any proceeding before the United States Patent and Trademark Office, the United States Copyright Office or any similar office or agency in any other country or any political subdivision thereof, to maintain and pursue each application (and to obtain the relevant registration) and to maintain each registration of the material Intellectual Property constituting Collateral, including, without limitation, filing of applications for renewal, affidavits of use and affidavits of incontestability.

(G) In the event that any material Intellectual Property constituting Collateral owned by Borrower is infringed, misappropriated or diluted by a third party, the Borrower shall (i) at Borrower's sole cost and expense, take such actions as Borrower shall reasonably deem appropriate under the circumstances to protect such Intellectual Property and (ii) if such Intellectual Property is of material economic value, promptly notify Lender after it learns of such infringement, misappropriation or dilution.

(H) Borrower shall perform all of its obligations under, and enforce all of its rights under, any and all licenses of Intellectual Property constituting Collateral.

(I) Borrower shall not grant any licenses to any third party (other than Lender) with respect to any Intellectual Property constituting Collateral, without the prior written consent of Lender.

8. **Insurance.** At its own cost, Borrower shall obtain and maintain: (a) insurance against loss, destruction or damage to the Collateral of the kinds and in the amounts customarily insured against by firms with established businesses engaged in the same or similar business as Borrower and, in any event, in an amount equal to 100% of the replacement cost thereof, and (b)

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insurance against public liability and third party property damage of the kinds and in the amounts customarily insured against by firms with established businesses engaged in the same or similar business as Borrower. All such policies shall (i) be issued by financially sound and reputable insurers, (ii) name Lender as an additional insured and, where applicable, as loss payee under a lender loss payable endorsement satisfactory to Lender, and (C) provide for 30 days written notice to Lender before such policy is altered or canceled. All of the insurance policies required hereby shall be evidenced by one or more certificates of insurance delivered to Lender by Borrower on the date hereof and at such other times as Lender may request from time to time.

9. **Payment and Collections.** To the extent that Borrower makes any payment to Lender or Lender enforces its security interests and liens or exercises its right of set-off, and such payment(s) or the proceeds of such enforcement or set-off are subsequently invalidated, declared to be fraudulent or preferential, set aside and/or required to be repaid to a trustee, receiver or any other party under any bankruptcy law, state or federal law, common law or equitable claim, then to the extent of such recovery, the liability originally intended to be satisfied shall be revived and continued in full force and effect as if such payment had not been made or such enforcement or set-off had not occurred and shall be Obligations secured by the Collateral.

10. **Events of Default.** It is understood and agreed that the occurrence of an "Event of Default" as defined in the Funding Agreement shall constitute an "Event of Default" hereunder and shall entitle Lender to take such actions as are provided in the Funding Agreement and as elsewhere provided in this Security Agreement.

11. **Rights and Remedies Upon Default.** Upon the occurrence and during the continuance of an Event of Default, Lender shall have the following rights and remedies in addition to the other rights and remedies contained in this Security Agreement, all of which may be exercised with or without notice to Borrower:

(A) To exercise all rights and remedies provided to Lender under the Funding Agreement upon the occurrence of an "Event of Default" under the Funding Agreement, including the right to declare all the Obligations, and have the same become, immediately due and payable;

(B) All of the rights and remedies of a secured party under the Uniform Commercial Code of the state where such rights and remedies are asserted, or under other applicable law, all of which rights and remedies shall be cumulative, and none of which shall be exclusive of any other rights and remedies contained in this Security Agreement or the Funding Agreement;

(C) The right to foreclose the liens and security interests created under this Security Agreement by any available judicial procedure or, to the extent permitted by law, without judicial process; and

(D) The right to pursue any other remedies at law or equity which Lender deems appropriate.

12. **Rights and Remedies Cumulative; Non-Waiver; Etc.** The enumeration of Lender's rights and remedies set forth in this Security Agreement is not intended to be



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exhaustive and the exercise by Lender of any right or remedy shall not preclude the exercise of any other rights or remedies, all of which shall be cumulative, and shall be in addition to any other right or remedy given hereunder, or under any other agreement between Borrower or Lender or which may now or hereafter exist in law or in equity or by suit or otherwise. No delay or failure to take action on the part of Lender in exercising any right, power or privilege shall operate as a waiver thereof, nor shall any single or partial exercise of any such right, power or privilege preclude other or further exercise thereof or the exercise of any other right, power or privilege or shall be construed to be a waiver of any Event of Default.

13. **Supplemental Documentation.** At Lender's request, Borrower shall execute and deliver to Lender, at any time or times hereafter, all documents, instruments and other written matter that Lender may reasonably request to perfect and maintain perfected Lender's security interest in the Collateral in form and substance reasonably acceptable to Lender, and pay all charges, expenses and fees Lender may reasonably incur in filing any of such documents, and all taxes relating thereto.

14. **Applicable Law.** This Security Agreement shall be governed in all respects by, and construed in accordance with, the laws of the State of New York, including without limitation the Uniform Commercial Code of the State of New York.

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IN WITNESS WHEREOF, Borrower has caused this Security Agreement to be duly executed by authority duly given as of the day and year first above written.

FIBERIGHT, LLC

By: 

Name: Craig Stuart-Paul

Its: Chief Executive Officer

NOVOZYMES A/S

By: 

Name: PAUL RUISEN ANDERSEN

Its: VICE PRESIDENT

Signature Page Security Agreement

PATENT
REEL: 029722 FRAME: 0985

EXHIBIT A
DESCRIPTION OF COLLATERAL

DEBTOR: FIBERIGHT, LLC ("Debtor")
SECURED PARTY: NOVOZYMES A/S ("Secured Party")

All of the following property of Debtor, whether presently existing or hereafter created or acquired, and wherever located, including, but not limited to:

- (a) all "Fiberight Project IP" (as such term is defined in the Research and Development Agreement, dated March 11, 2010, as amended June 10, 2011, between Secured Party and Debtor, as further amended, modified, or supplemented from time to time (the "R&D Agreement"));
- (b) any and all of Debtor's rights, title and interests in and to (i) any "Joint Project IP" (as such term is defined in the R&D Agreement) and (ii) any other rights in any Intellectual Property (as such term is defined in the R&D Agreement) now owned or hereafter acquired by Debtor pursuant to the R&D Agreement;
- (c) any books and records regarding the foregoing; and
- (d) any and all cash proceeds and/or noncash proceeds of any of the foregoing, including, without limitation, insurance proceeds, and all supporting obligations and the security therefor or for any right to payment.

This Collateral shall include, without limitation, the Intellectual Property set forth on the Schedules to this Exhibit.

Schedule A-1 - Patents

I. REGISTERED PATENTS

- U.S. patent 7,758,719 granted July 20th 2010

II. PATENT APPLICATIONS

- European patent application #06849955 and publication #EP2026647
- Canadian patent application #2,633,305 lapsed May 2011, reinstatement in process
- Continuation-in-Part of Application filed July 20, 2010 application #12/839,655.

Schedule A-2 - Trademarks

I. REGISTERED TRADEMARKS

None

II. TRADEMARK APPLICATIONS

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Trashanol and Trashenol (Applications pending)

Schedule A-3 – Copyrights

I. REGISTERED COPYRIGHTS

None

II. COPYRIGHT APPLICATIONS

None

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EXHIBIT B

ADDITIONAL INFORMATION REGARDING BORROWER

1. The exact legal name of Borrower is: Fiberight LLC
2. Borrower's Federal Employer Identification Number is: Tax ID# 77-0700865
3. If Borrower has changed its name since it was formed, its past legal names and last dates such names were used are as follows: None
4. Borrower uses in its business the following trade names: Fiberight, Trashanol
5. Borrower was organized under the laws of the following state and is in good standing under those laws:

Entity

State/Commonwealth of Organization

Fiberight, LLC

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6. Borrower has its chief executive office and its principal place of business at the following location:

Entity

Chief Executive Office

Fiberight, LLC

5707 Calverton Road (Suite B)
Catonsville, MD 21228

7. The following entities (a) have been merged into Borrower, (b) have sold substantially all of their assets to Borrower or (c) have sold assets to Borrower outside the ordinary course of their business since Borrower was incorporated:

Atlantic Recycling Technologies, LLC

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INTELLECTUAL PROPERTY

Overview of the Fiberight Technology

Fiberight has developed a proprietary extraction and processing technology to unlock the potential for 2.6 billion gallons of renewable bio-fuel and 1.3 billion gallons equivalent of biogas contained in the 116 million tons of non-recyclable Municipal Solid Waste (MSW) generated each year in the US. Fiberight uses a highly cost effective biochemical and enzymatic process involving digestion and a proprietary fermentation to turn trash into advanced bio-fuels. Fiberight's business model converts the non-recyclable organic components of MSW such as contaminated paper, food wastes, and other degradable matter into fuel-grade cellulosic ethanol and biogas for plant energy and renewable electricity sales. Fiberight is able to convert both the C6 and C5 sugars into fuel for high yields exceeding 93 gallon per ton of dry processed MSW feedstock. These higher yields are achieved as a result of Fiberight's proprietary pulping and pre-treatment technologies and the incorporation of a fermentive thermophilic ethanologen provided by TMO Renewables under a US exclusive license agreement.

In addition to producing cellulosic ethanol from the organic fraction of waste, Fiberight derives value from the high energy potential in its process waste water that can support optimized anaerobic digestion for electricity generation, LP steam production and equivalent diesel CNG for zero net energy. Additional revenue is generated from the sale of residual plastics and metals that are separated from the inbound waste stream. Remnant processed fiber can also be manufactured into other renewable co-products such as fertilizer pellets, animal/poultry bedding, SMA road fibers or pressed panel fiberboard. Fiberight's proprietary technology processes involve specialized waste treatment and biochemical technologies to efficiently turn MSW into bio-fuel. The facilities operate at low temperatures in a closed-loop system resulting in very low levels of emissions or effluents.

Fiberight has completed three years of research and development of its technologies commencing with a goal of finding valuable uses of non-recycled waste in early 2007. The company has operated a pilot plant facility in Lawrenceville, VA since 2007 as well as completed 100,000 gallon batch test operations in Iowa as well as numerous development tests in the United Kingdom at TMO facilities. Initial operations at the Blairstown plant were tested during Q3 2010.

TECHNOLOGY PROCESS DESCRIPTION

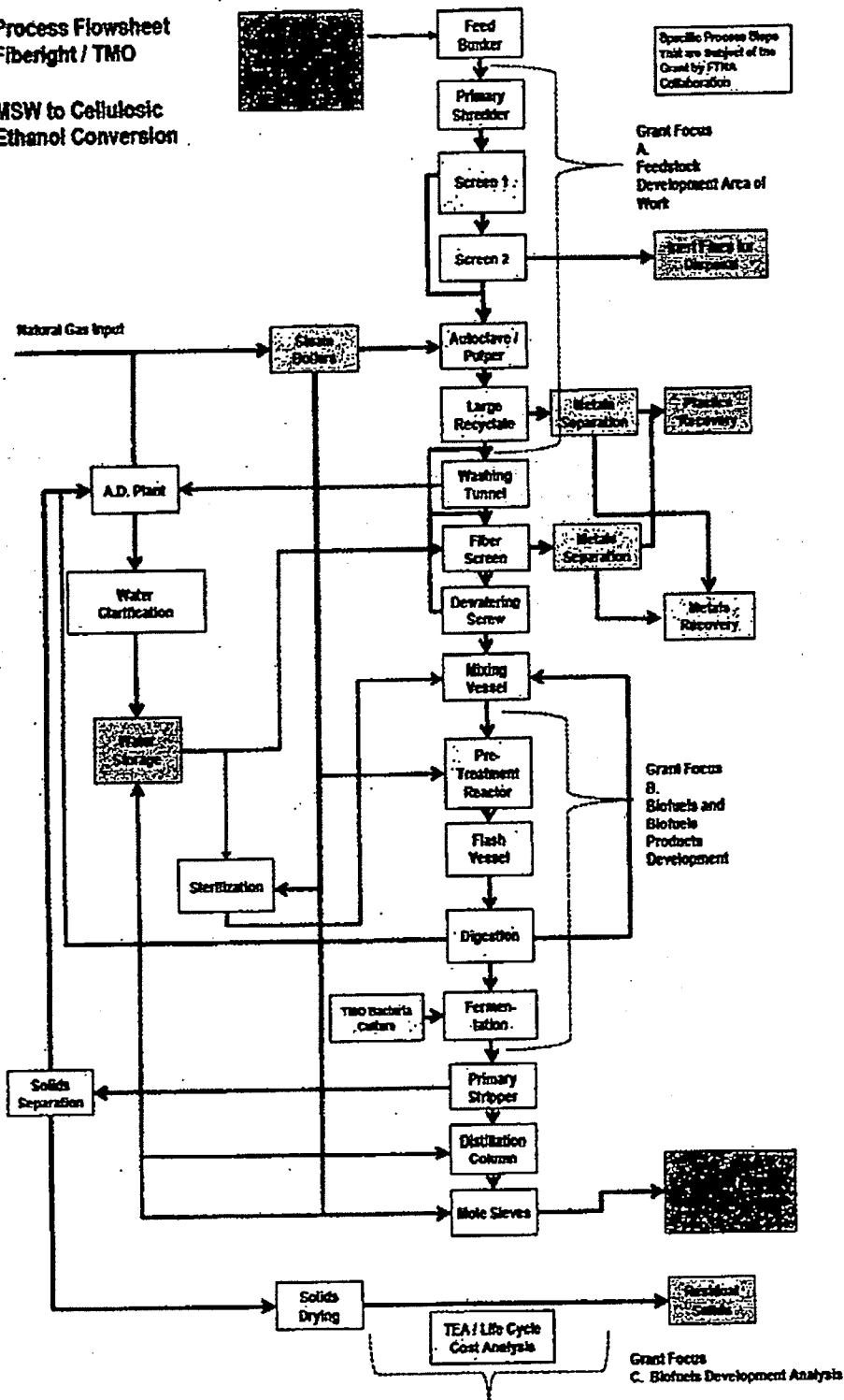
Fiberight has developed a proprietary process to produce cellulosic biofuel and biogas from municipal waste stream trash. Fiberight has solved many of the major problems plaguing competing technologies that seek to produce cellulosic ethanol, in particular the separation of inorganic materials (glass, metal, rocks, plastics, etc.) from organic materials and the concentration of organic materials into a low ash cellulosic pulp that can be easily digestible into sugars.

The Fiberight process requires less energy usage than competing technologies based on gasification of feedstock and is consequently potentially less capital intensive due to lower gas scrubbing requirements. Fiberight is focusing on refining its step for pre-sorted MSW with the use of autoclave technology.

Fiberight will optimize process modules and incorporate MSW organics into a core digestion process by type, starting with contaminated paper, and then adding other organics (food scraps) with appropriate pre-treatment at the pre-sort stage. Fiberight focuses on specialized pretreatment digestion and conversion technologies that allow different feedstock to be introduced to its process at various points. Fiberight will be leveraging the technical expertise and experience of its internal management team as well as that of external vendors.

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MSW to Cellulosic Ethanol Conversion



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FIBERIGHT INTELLECTUAL PROPERTY

- Fiberight has U.S. patent 7,758,719 granted July 20th 2010
- European publication number EP2026647
- Continuation-in-Part of Application filed July 20, 2010 12/839,655.

These are for technology associated with the pre-treatment, pulping and ash removal steps which defend Fiberight's position as an approved pathway by the US EPA for cellulosic biofuel credits. Fiberight controls unique knowledge related to its expertise in sorting and fractionating large volumes of non-homogeneous waste materials for effective conversion into sugars. Fiberight has also developed methods to convert the undigested waste elements of the feedstock into marketable pulp products.

PROPRIETARY KNOWLEDGE

As research and testing continues, the list of Proprietary Knowledge, which may increase, will require strategic decisions regarding whether or not to pursue patents.

MSW Segregation

1. Ability to process highly contaminated MSW derived waste;
2. Understanding of the water treatment issues surrounding this type of process allow the definition of development work.
3. Concentration of cellulose feedstock from 40% to > 80% available carbohydrate

Enzymatic and Digestion

1. Identification of the process constraints within a standard corn ethanol plant and how to overcome them
2. Development of the two stage fed batch reaction process allow solids contents of 25%w/w⁽³⁾ of dry feed to be added to a single batch to avoid yield loss from solids addition
3. Demonstration of the ability to produce economically viable (>5%v/w) ethanol concentrations

Laboratory

1. Reduced enzyme loading for a given solids loading for the conversion of both C5 and C6 sugars;
2. Identified the ability to ferment with enzyme and inert solids present;
3. Development of sterilization procedures that are cost effective
4. Clear understanding of the development requirements and analytical techniques to move to the next level.

Pre-Treatment

1. Development of a simple low energy (135°C) approach to pre-treatment comparative to other pre-treatment technologies (160-200°C).
2. Development of other low-impact methods (including joint I.P. with Novozymes) and additives that demonstrate low-cost pretreatment methods to reduce enzyme dosing.

Sterilization

1. Identification of low cost methodologies such as use of stabilized chlorine dioxide and fermentation conditions to control the environment maximizing yield of ethanol and minimizing contamination. Fiberight is also optimizing a high temperature fermentation technique at TMO's process development unit.

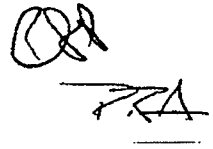

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Water Treatment and Recovery Achievements

1. Identified that the enzymatic process improves the energy potential of undigested substrate;
2. Development of low energy solution to the recovery of water for the system rather than the industry standard evaporation processes, mirroring processes at European A/D plants.
3. Development (with University of Southampton) bespoke method to enable high-rate reaction (<12 hrs) optimized to MSW derived process liquor.

Energy Recovery/Generation Achievements

1. Identified and tested the ability to convert fractionated mixed plastics into plant energy;

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