


Project Summary
Chemtech Ltd

Oil Refinery & Integrated Post Petrochemical Manufacturing Complex
in the Republic of Guyana South America

January 2022

Disclaimer

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Any estimates and projections contained herein have been prepared by the Company and involve significant elements of subjective judgment and analysis which may or may not be correct. The Company makes no representation or warranty, expressed or implied, as to the accuracy or completeness of the information contained in this business plan, and nothing contained herein is, or shall be relied upon as, a promise or representation, whether as to the past or the future. This business plan does not purport to contain all of the information that may be required to evaluate a transaction and any recipient hereof should conduct its own independent analysis of the Company and the data contained or referred to herein.

Introduction.
Chemtech is a special purpose company registered in the Republic of Guyana South America to establish energy and non-energy industries in the country.

Chemtech proposes to establish an integrated chemical complex at Plantation York.
The design for the Integrated Complex DO NOT require Natural Gas. (it's adding value to Guyana's natural Resources).

Integrated Complex:

- The Integrated Chemical Complex will process Methanol further downstream to produce Formalin, Para Formaldehyde, Phenol Formaldehyde, Urea Formaldehyde and Urea Melamine Formaldehyde, which will be used to produce:
- Oriented Strand Board (OSB)
- Veneer board
- NPK (Nitrogen, Potash and Potassium) fertilizer and
- Sulfur Coated Urea (SCU) slow-release fertilizer.

The project will be a pioneer in Guyana for processing 1st stage downstream products (Methanol, Urea, Melamine etc.) to marketable products (Veneer Board, OSB, Para Formaldehyde, Urea Formaldehyde, NPK & Slow-Release Fertilizer, Adhesives Coatings etc.). that can generate both revenue from exports and domestic profit, training employees for higher skill jobs and employment in the country. As a result of the aforementioned Guyana will be producing world class products for domestic and international markets.

PLEASE NOTE:
There is no need for Natural Gas for this project.
This project is designed to utilize the products already made from the Natural Gas, such as Methanol and Urea.

The Formalin Plant capacity is 55,000 Tons Per Year (TPY) this plant will process 55,000 TPY of Methanol, the average methanol plant capacity is from 150,000 Tons Per Day (TPD) to 500,000 Tons Per Day (TPD). At this time, it is feasible to import the Methanol because the quantity required is very small, this will be imported in specialized containers until a Methanol plant is being built to supply the local requirements. This is a safe and reliable method which is being used World Wide.

The Para Formaldehyde plant capacity is 10,000 Tons Per Year (TPY), this is a by-product from the Formalin Plant. This will process the solution to a powder to give the product a shelf life and for export purposes.

Sulfur Coated Urea plant capacity is 100,000 Tons Per Year (TPY). The Urea will be imported in specialized containers. At this time, it is feasible to import the urea because the quantity required is very small until a Urea plant is built to supply the local requirements. These plants have a production capacity from 100,000 Tons Per Day to 300,000 Tons Per Day Plus.

The NPK Plant capacity is 66,000 Tons this will utilize products from the Sulfur Coated Urea Plant (SCU) we will also import 20,000 Tons of phosphorous and 20,000 tons of potash to manufacture the NPK.
The Veneer Board plant is 18,155 Cubic meters of wood per annum, this plant will utilize the products from the Fomalin plant.
The Oriented Strand Board plant will process 80,000 Cubic Meters of wood Per Annum, this plant will utilize the products from the Formalin plant.

However, in the future when the Gas to Shore project comes on stream and methanol and Urea plants are built Chemtech will be happy to purchase from the local plant.

PLEASE NOTE:
This project will add value to the natural resources and it will create over 300 permanent jobs and 1,000 during construction.
Chemtech intentions is to build a 20,000 square feet Fabrication shop to support the construction of the facility and for the maintenance of the proposed plant.

The Fabrication Shop consists off a Machine shop, Welding and Fabrication, Electrical shop and specialized equipment for building Tanks, High Pressure Certified Vessels. This facility will have the capability of supporting the Oil and Gas sector. This project will have work for the Fabrication facility for a minimum of two years. We have a second phase which will create another three years of work for the said facility.

Business Summary

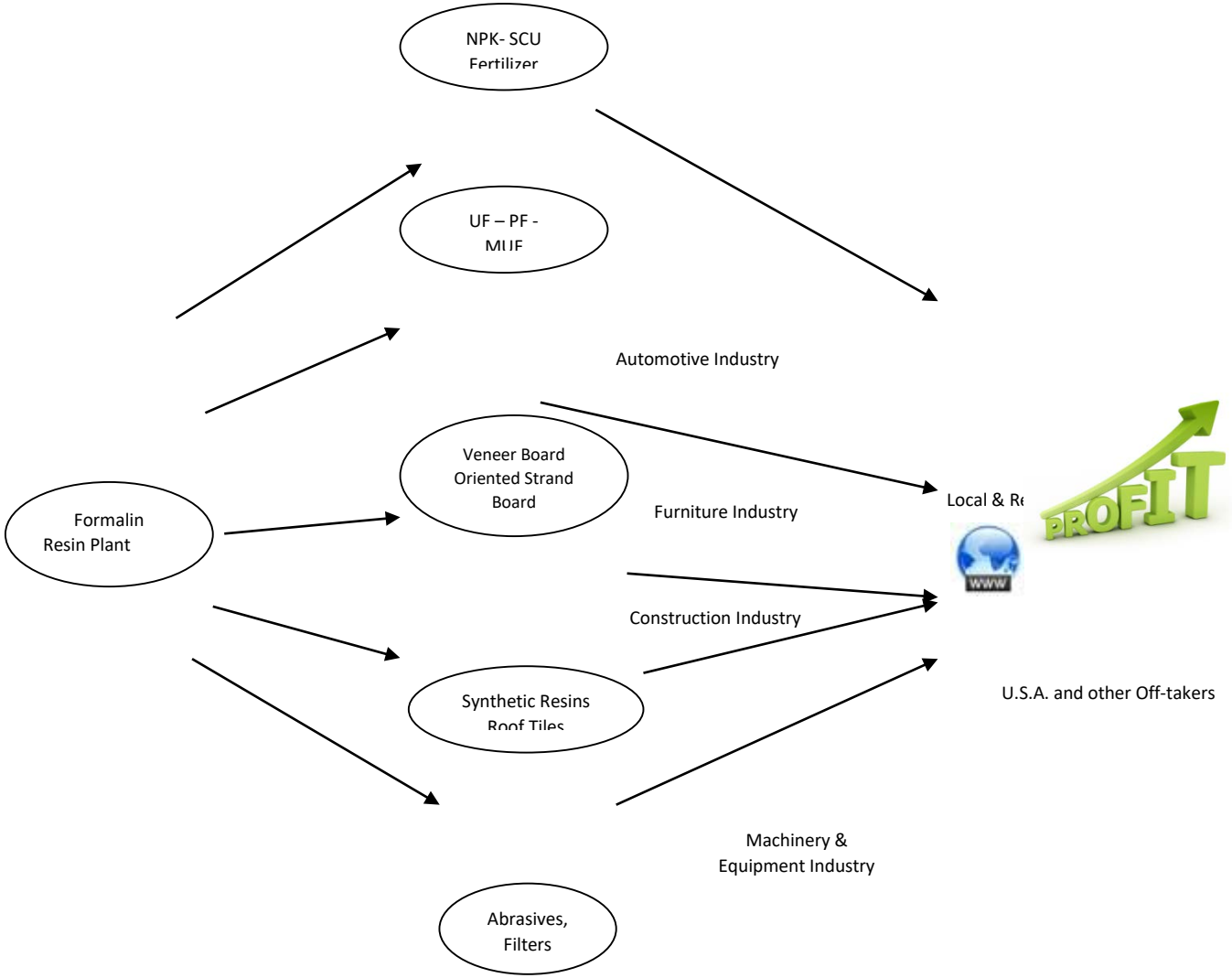
To Provide a World Class Integrated Chemical Complex. The Formaldehyde Melamine Resins Cluster includes a Para Formaldehyde, NPK & Slow-Release Fertilizer (SCU), Veneer board and OSB (Oriented Strand Board) plant. This Integrated Chemical Complex will be in the First phase based on the current demand for fertilizer.

The Opportunity

The Government of the Republic of Guyana is seeking to further diversify the economy from Oil and Gas, mining and the export of logs, there is a need to develop the downstream industry. This oil refinery will produce the products which is being imported at this time, the excess will be for the markets in the Caribbean, these products are being imported and sold at very high cost to the end users, the integrated complex will be a pioneer in processing 1st stage downstream products (Methanol, Urea, Melamine etc.) to marketable products (veneer board, Oriented Strand Board OSB, Urea Formaldehyde, Phenol Formaldehyde, Melamineormaldehyde, NPK & Slow Release Fertilizer SCU, Adhesives, Coatings etc.) in global demand that can generate significant foreign exchange and employment for the country. As a result of the aforementioned, the complex will be adding value to the natural resources of the Country.

The Solution/Product Offering

Conceptualize, design, develop and construct an integrated (symbiotic) chemical / manufacturing complex that processes the products and by-products from other plants to produce marketable international products:


NPK- SCU
Fertilizer
UF – PF -
MUF
Automotive Industry
Veneer Board
Oriented Strand
Board
Formalin
Resin Plant
Furniture Industry
Local & Re
PROFIT
www
Construction Industry
Synthetic Resins
Roof Tiles
U.S.A. and other Off-takers
Machinery &
Equipment Industry
Abrasives,
Filters

Republic of Guyana, Regional and International Partnership:

Adding Value to the natural resources.

Chemtech Inc. understands that strategic alliances and partnerships are critical not only to the success of the project but the development of the region through maximising regional countries natural resources and strengths.

Chemtech has identified Guyana as a developing Country in the world via its natural resources and this potential economic giant is an attractive place for investment

Labour cost is competitive on the world market to further develop the downstream industries, Guyana has a developing mineral industry, oil & gas and a lumber industry.

A strategic partnership with the Guyana Government to supply the feedstock for the oil refinery and / or Private sector to supply the raw material to support the Veneer Board and Oriented Strand Board (OSB) plant and other related products in the Integrated Complex.

Chemtech board industry in Guyana will utilize the adhesives manufactured from the chemical complex, the excess will be for the export market. This project will create several jobs for the wood industry, the engineered board will be termite resistance, and not forgetting this will generate foreign currency.

The Engineered Board (OSB) Oriented Strand Board will be an opportunity to build low income houses, luxury homes and pre-fabricated homes for the export market.

Veneer Board will allow the manufacturing sector to export world class furniture.

Conclusion:

Chemtech has a letter from GOINVEST (responsible for Guyana projects development) to establish the complex.

Permission to build from the Regional Democratic Council, Region #4 (in line with Governments requirements)

Project location: Zone EBDR, Block XLI: being parcel 52 & 54. Plantation York, and comprising 117.0 & 375.4 acres of land.

Off take and Supply of Raw Material has been identified.

Engineering and Technology has been identified.

Equipment suppliers have been identified.

The EPA requirements will be carried out as necessary in keeping in line with the Government policies.

Process and Technical data are available for each plant.

Finance: United Securities Trust of Switzerland

The wood industry will avoid the export of raw logs by adding value to Guyana natural resources. This project will be developed on a phase basis.
First Phase: Integrated Chemical Complex.
Second Phase: this complex will require a Port in the second phase, this will include ship building and repairs, and this will also service the onshore and offshore Oil and Gas industry. This project is estimated approximately $200. Million Dollars.

Summary:

Chemtech is a special purpose company registered in the Republic of Guyana South America to establish energy and non-energy industries in the country.

The design for the Integrated Complex **DOES NOT** require Natural Gas. (IT'S ADDING VALUE TO GUYANA NATURAL RESOURCES).

Re: With the current situation on the World shortage of agriculture products, Chemtech proposes to fast track the FERTILIZER PLANT.

Integrated Complex:

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- Oriented Strand Board (OSB) • Veneer board
- NPK (Nitrogen, Potash and Potassium) fertilizer and • Sulfur Coated Urea (SCU) slow release fertilizer.

The project will be a pioneer in Guyana for processing 1st stage downstream products (Methanol, Urea, Melamine etc.) to marketable products (Veneer Board, OSB, Urea, Formaldehyde, NPK & Slow- release Fertilizer, Adhesives Coatings etc.). that can generate both revenue from exports and domestic profit, training employees for higher skill jobs and employment in the country. As a result of the aforementioned Guyana will be producing world class products for domestic and international markets.

The project will be located on parcels of land at Plantation York comprising of 492 acres of land with a water front of approximately four thousand feet and 80 Km from Georgetown and 20 Km from the City of Linden. GPS:
(1) N 685790.00 / E. 35'8443.00 (2) N 685949.96 / E. 358501.22 (3) N 685281.05 / E. 35'5354.27

Overview

Chemtech Modular Complex:

The Modular Advantage – New modular construction provides significantly greater freedom and flexibility over conventional stick-built construction with respect to the equipment capital expenditures and, especially, length of time required to complete a project. Generally accepted industry data suggest modular construction can often save on the order of 25-50% of project capital cost, while significantly reducing project time to completion, often reducing the project schedule by as much as 50% versus conventional, stick-built construction.

Chemtech proposes to constructs its equipment as required in its own fabrication shop in a controlled environment—out of the elements and away from labor, weather and geopolitical instabilities that may exist at a project site.

Chemtech Modular equipment skids can be quickly connected via inter-skid piping and installed and commissioned, with minimum expenditure of time and labor on-site. Further, it is possible, with modular equipment, to expand the capacity of a plant incrementally, either using cash flow from existing operations or through financing an increment of the project, rather than the need to fund the complete anticipated capacity of the plant up front, as would be required for stick-built construction. Additional capacity can be added to the complex over time as cash flow or financing permits, without sacrificing efficiencies in construction.

Our equipment will have a lower operating cost than conventional units, at least in part because of our design utilizing proven technology from Companies with similar plants operating in other Countries.

The above is in line with the Governments plans to create significant employment and training local employees for the energy sector.

Overview of the Integrated Complex Key Components

Formaldehyde Plant / Resins Technology

The supplier of capital equipment and the technology is Dynea.

Dynea is based in Norway and is a producer of Chemical Product and Preparation Manufacturing.

Dynea is a global leader in providing high performance adhesion and surfacing solutions and is one of the world's leading providers of industrial adhesive system. Dynea is a responsible leader in developing environmentally preferred and safe products, services and operation with consistent quality. Dynea has over 60 years operational experience in Europe, Asia and USA. Dynea has designed, constructed and started up more than 40 Formaldehyde and resins plants world-wide and has improved both processes to the state of art Technology for production of formaldehyde and resins in use today around the Globe.

Supplier of Equipment And Technology	Dynea
Capacity	55,000 MTPY Silver contact Formaldehyde plant

Paraformaldehyde Plant

P &ID Company Ltd. established in June 2000 in order to contribute to the industrial growth of Korea. The company continues to be a specialized leading company in Chemical engineering and Chemical manufacturing, within the field of specialty Chemicals and Petrochemical Plants.

Supplier of Equipment And Technology	P & ID
Capacity	10,000 MTPY
Operating days	330
No of shifts	3

Veneer Plant

The supplier of capital equipment and the technology, Angelo Cremona founded in Monza in 1892 was one of the first Italian companies to manufacture woodworking machinery, and achieved immediate success.

Angelo Cremona is currently a merged entity between the best north Italian Companies – OLM, ITMAC, And Angelo Cremona –capable of offering a wide variety of equipment, ranging from peeling lathes and slicers to veneer dryers. So far, they have served more than 2,000 customers from all around the World from Africa to Russia, and from Asia to America.

This small company founded over a century ago has now become a world leader and stands out in the international markets for its technology and quality.

Supplier of Equipment And Technology	Angelo Cremona
Capacity	Veneer Slicing Plant – 18,150 M3 PA
Operating days	330

Oriented Strand Board Plant

The supplier of capital equipment and the technology, Dieffenbacher is an internationally active group of companies that develops and manufactures press systems and complete production systems for the wood panel industry, the automotive and components industries.

As a system supplier, they offer customers ground-breaking comprehensive solutions for making the products the market wants in an economical way. They supply everything from a single source and develop all decisive process components within the group of companies.

Deffenbacher is certified in accordance to the quality directives DIN EN ISO 9OO1 and VDA 64, and makes an active contribution to safeguarding the environment. They have accumulated over 130 years of experience and are a leading technology compound in their segment.

Supplier of Equipment and technology	Dieffanbacher
Caoacity	Single Opening Press Plant: 80,000 M3 PA

SCU Fertilizer Plant

The supplier of capital equipment and the technology; G. Deqinne Management Inc, offers competitive advantage through the company's professional strengths. The company offers personalized expertise and provides team work with strong project management and engineering skills, expertise to and experience to initiate, develop and execute projects successfully from its conceptual phase through to its beneficial operation milestone. The combination of astute project management and engineering and with tenacity, persistence leadership, dedication loyalty, responsibility and commitment lends to the company proven industrial track record of success.

Supplier of Equipment And Technology	G. Dewinne Management Inc.
Capacity	SCU Plant – 100,000 TPA
Operating days	330

NPK Fertilizer Plant

The supplier of capital equipment and the technology is Gayatri Fertiplants International PVT Ltd. Was established May 26,2010. Guyatri Fertiplants International Private Limited (An ISO 90018 Certified Company) is engaged in the manufacturing exporting and supplying of Chemical Plants & Fertilizer Plants.

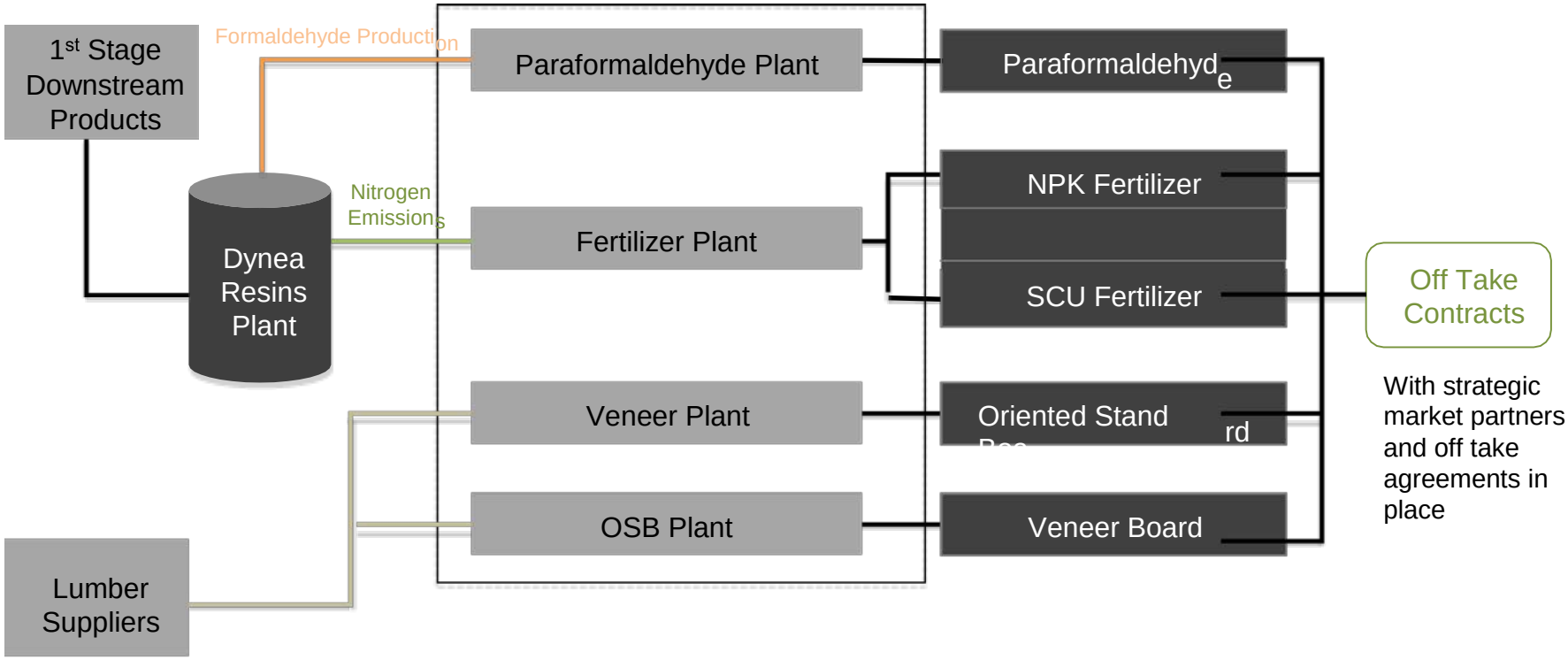
The organization is also providing designing, fabrication, erection and commissioning services for the plants. To meet the specific requirements of the clients, the company offers various customization options.

Supplier of Technology And Technology	Gayatri Fertiplants International PVT LTD.
Capacity	NPK Plant – 66,000 TPA
Operating Days	330

Chemtec Complex Production Flow Overview

Chemtec's integrated complex will be a pioneer in processing 1st stage downstream products (Methanol, Urea, Melamine etc.;) into base products (veneer board, Oriented Strand Board OSB, Urea Formaldehyde, Phenol Formaldehyde, Melamine Formaldehyde, etc.) which will be converted to marketable products to supply the global demand, which in turn, will generate significant foreign exchange and employment for the country.

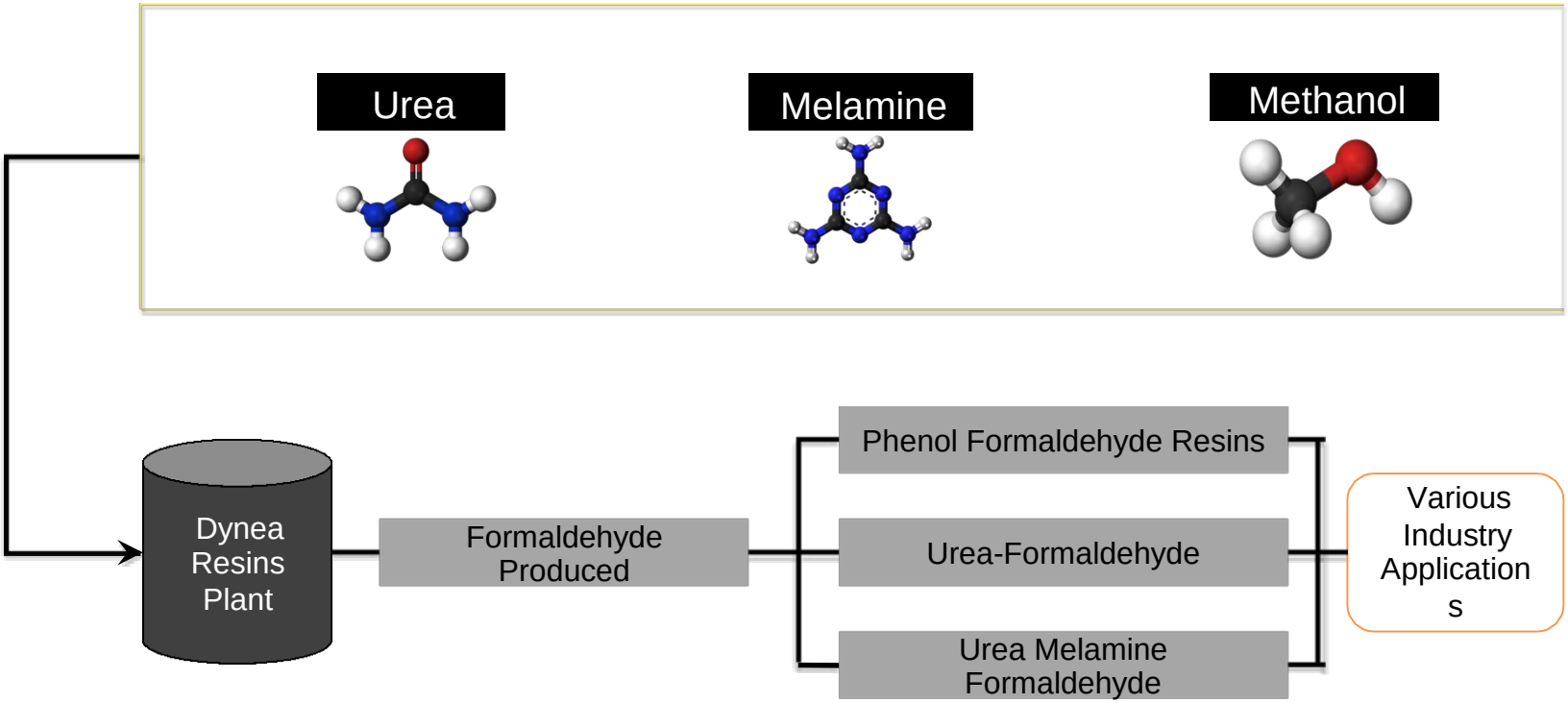
1st Stage Raw Material Purchased	2nd Stage Raw Material Processing	3rd Stage End Products Manufactured and Produced	End Products for Sale	Distribution & Sales



First Stage Raw Materials Purchased

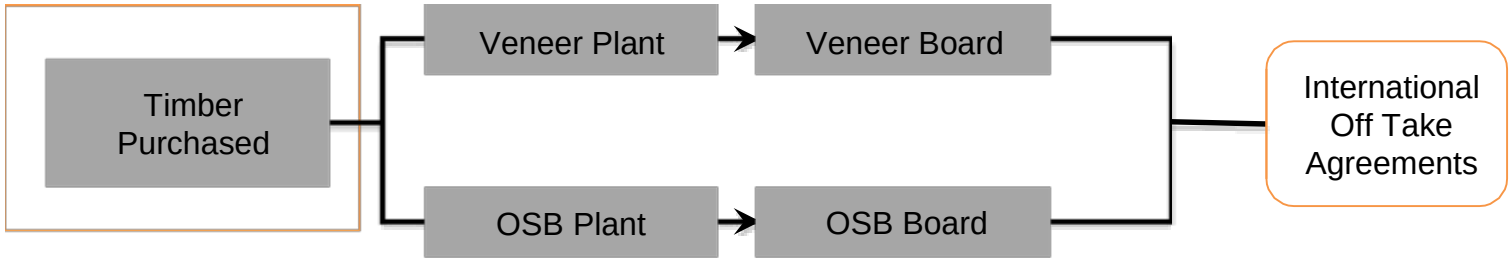
Chemtech will be purchasing first stage raw materials (Urea, Melamine and Methanol) to be utilized in the Dynea Resins Plant which will be responsible for the early stage production of formaldehyde. Once the formaldehyde is produced, several other formaldehyde product variations will be produced, such as phenol formaldehyde resins, urea-formaldehyde, and urea melamine formaldehyde.

1st Stage Raw Materials Purchased

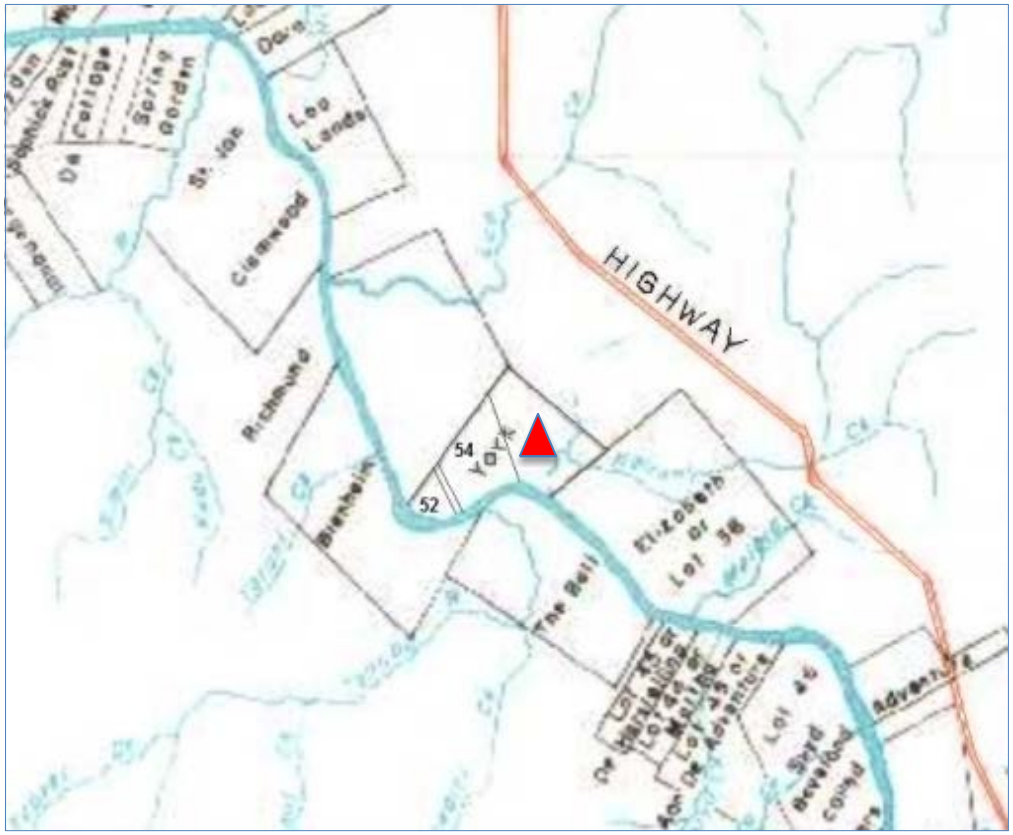


Additional Materials to be Purchased

Timber is a key ingredient for Chemtec's production of veneer boards and oriented strand boards. Chemtech will purchase the timber from local supplies. The purchased timber will be used in the veneer plant and the OSB plant utilizing productions systems provided by Angelo Cremano and Dieffenbacher. The veneer boards and OSB will be exported globally based on the off take agreements the Company has structured.



Land and Zoning



Lots 52 (117 acres) and/or 54 (375.4 acres), block XLI, Plantation York, on the Demerara river shore at 80 km from Georgetown

- Straight line from lots to Soesdyke – Linden highway: Around 6 Km.
- Water front both lots: Around 1.1 Km
- Elevation over maximum river level: From 1.2 to 4 m plus.


Union Industrial Estate
Chemtech Ltd
North Atlantic Ocean
Morawhanna
Mabaruma
Matthews Ridge
Marlborough
Charity
Anna Regina
Suddie
Cuyuni
GEORGETOWN
Enmore
Fort Wellington
New Amsterdam
Corriverton
Linden
Bartica
(Claimed by Venezuela)
VENEZUELA
Mazaruni
Rockstone
Kamuda Village
GUYANA
Mahdia
Ituni
FRENCH GUIANA
Mt. Roraima
Potaro
Kaieteur Falls
Berbice
Orinduik
SIERRA PACARAIMA
Karasabai Village
Courantyne
Apoteri
SURINAME
Kumaka
Good Hope
Lethem
Pilinawa
New
Essequibo
Isherton
(Claimed by Suriname)
BRAZIL
Biloku

Second Stage Raw Materials Processing

Chemtech will produce four major base products within its DYNEA resins plant that are its processed raw materials for the end products for sale. These base products include:

•Formalin, or Formaldehyde is a common precursor to more complex compounds and materials. Products generated from formaldehyde include urea formaldehyde resin, melamine resin, phenol formaldehyde resin, polyoxymethylene plastics, 4-butanediol, and methylene diphenyl disocyanate. It is more complicated than many simple carbon compounds in that it adopts several different forms. As a gas, formaldehyde is colorless and has a characteristic pungent, irritating odor. Upon condensation, the gas converts to various other forms of formaldehyde (with different chemical formulas) that are of more practical value. One important derivative is the cyclic trimer metaformaldehyde or 1,3,5-trioxane which is a linear polymer also called paraformaldehyde. These compounds have similar chemical properties and are often used interchangeably.

•Phenol formaldehyde resins are synthetic polymers obtained by the reaction of phenol or substituted phenol with formaldehyde. Phenolic resins have been mainly used in the production of circuit boards but have been largely replaced with epoxy resins and fiberglass cloth. Phenol formaldehyde resins are better known, however, for the production of molded products including billiard balls, laboratory countertops, and as coatings and adhesives. In the form of Bakelite, they are the earliest commercial synthetic resin. Phenol-formaldehyde resins, as a group, are formed by a step-growth polymerization reaction that can be either acid- or base-catalysed. Since formaldehyde exists predominantly in solution as a dynamic equilibrium of methylene glycol oligomers, the concentration of the reactive form of formaldehyde depends on temperature and pH.

•Urea-formaldehyde, also known as urea-methanol, so named for its common synthesis pathway and overall structure, is a non-transparent thermosetting resin or plastic, made from urea and formaldehyde heated in the presence of a base. These resins are used in adhesives, finishes, particle board, MDF, and molded objects. UF and related amino resins are considered a class of thermosetting resins of which urea-formaldehyde resins make up 80% produced globally. Examples of amino resins include automobile tires in order to improve the bonding of rubber to tire cord, paper for improving tear strength, molding electrical devices, molding jar caps, etc.

•Urea Melamine Formaldehyde (MUF) resin is widely used as an adhesive in wood industries, coating technology, paper industries and as a main material in kitchenware production.

Key Industry Applications of Chemtech Manufactured Products

Formaldehyde
•Textile Industry
• Automotive Industry

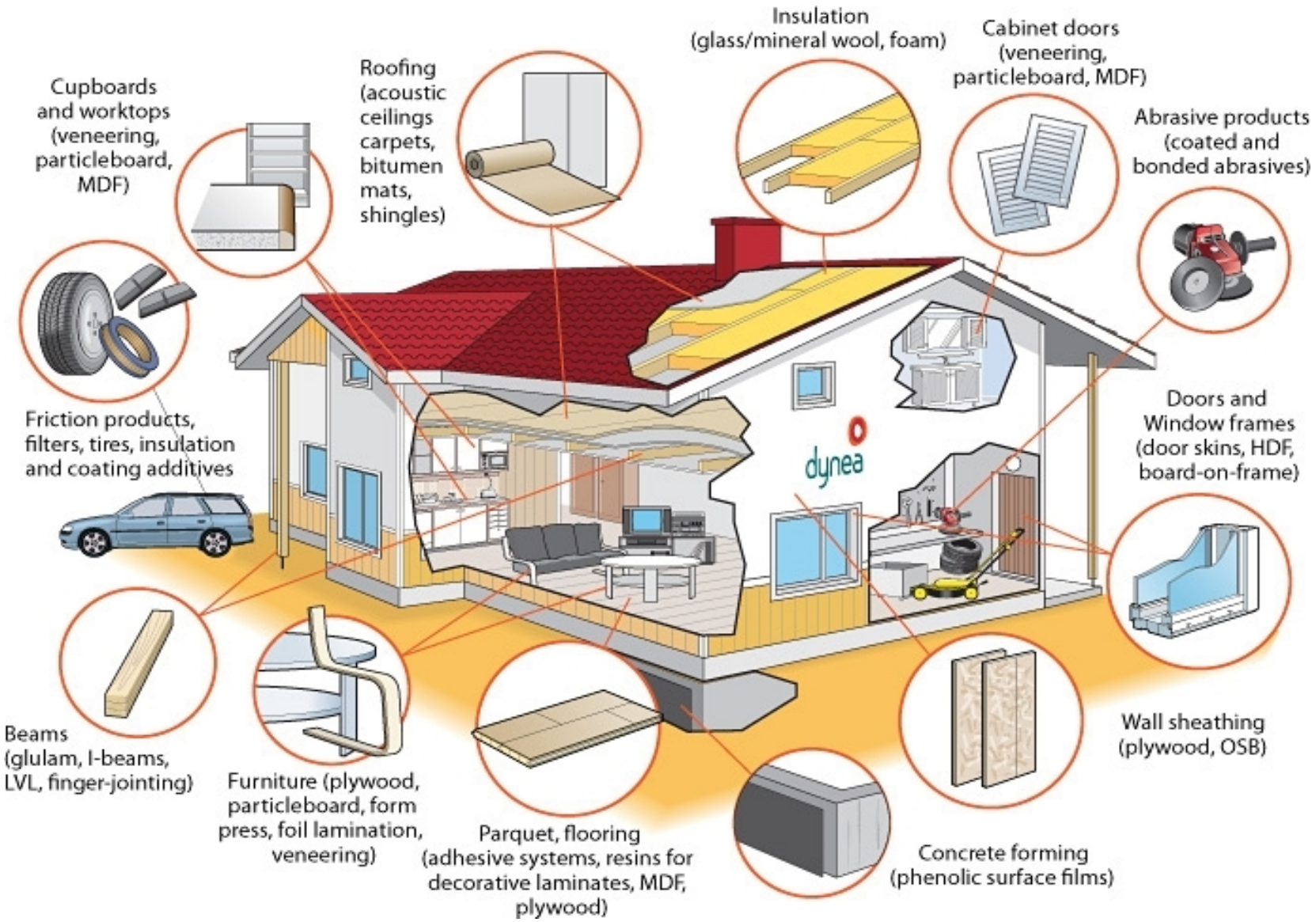
Para-Formaldehyde
• Chemical Industry
• Wood-based Panel Industry • Automotive Industry
• Furniture and Construction Industry • Energy Business & Agriculture

Veneer Boards
• Furniture and Construction Industry
• Flat panels including desk and counter tops, panels for cabinets, doors, and parquet floors

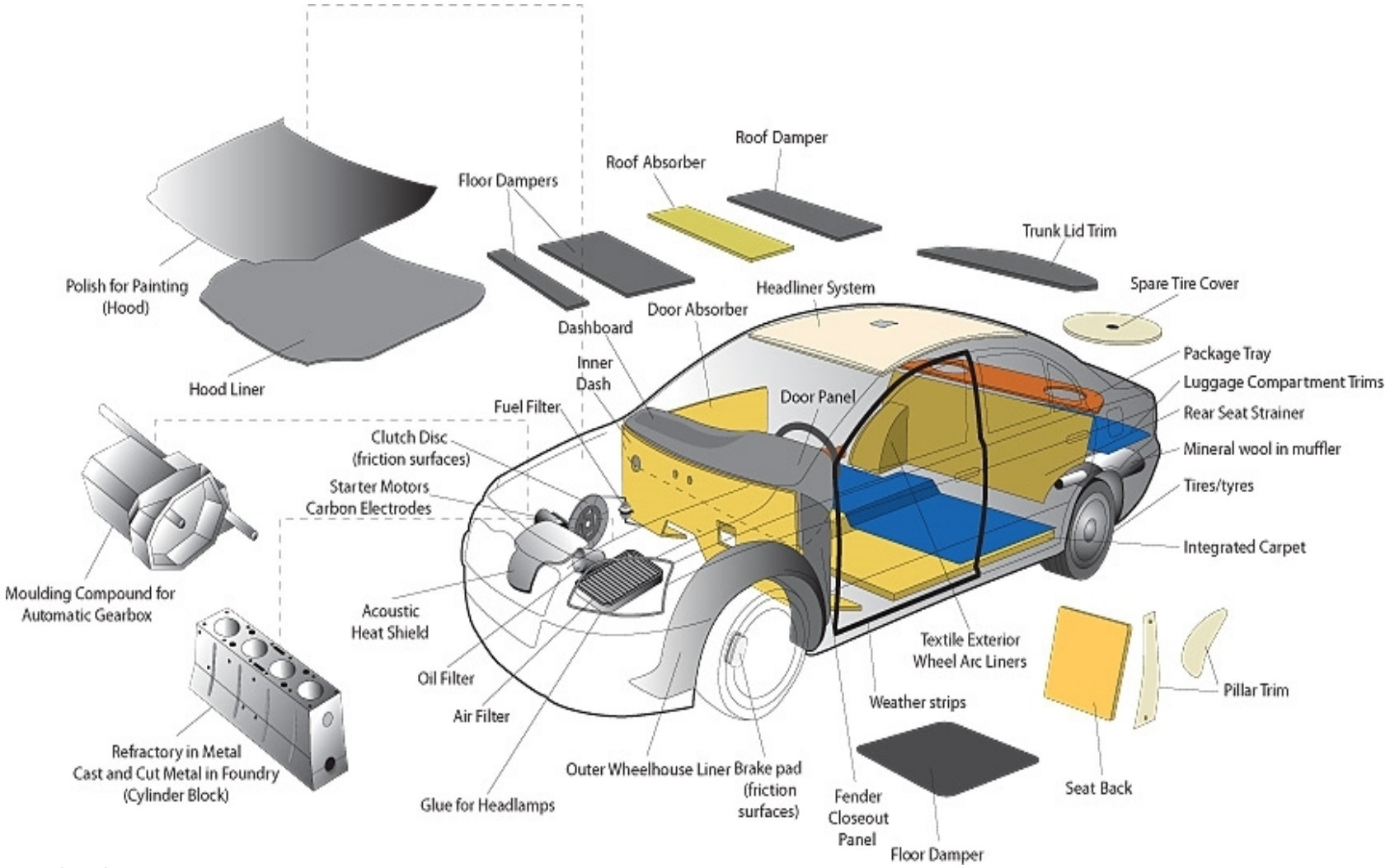
Oriented Strand Board
• Construction Industry
• Engineered and laminated timbers, boards and plywood

Fertilizers
• Agriculture Industry
• Most common used fertilizers applied in a variety of agricultural applications

Home and Industrial – Multifaceted Uses



Key Applications of Chemtech Manufactured Products Automotive Components



Key Applications of Chemtech Manufactured Products - Veneer Board

Veneer refers to thin slices of wood, usually thinner than 3 mm (1/8 inch), that typically are glued onto core panels (typically, wood, particle board or medium -density fiberboard to produce flat panels such as doors, tops and panels for cabinets, parquet floors and parts of furniture. They are also used in marquetry. Veneer is obtained either by "peeling" the trunk of a tree or by slicing large rectangular blocks of wood known as flitches. The appearance of the grain and figure in wood comes from slicing through the growth rings of a tree and depends upon the angle at which the wood is sliced.

Some advantages of furniture made with wood veneer is that it uses less wood than the same piece of furniture made with solid wood. Some projects built using wood veneer would not be possible to construct using solid lumber, owing to expansion and contraction caused by fluctuation of temperature and humidity

Engineered wood, also called composite wood, man-made wood, or manufactured board; includes a range of derivative wood products which are manufactured by binding or fixing the strands, particles, fibers, or veneers or boards of wood, together with adhesives, to form composite materials. These products are engineered to precise design specifications which are tested to meet national or international standards. Engineered wood products are used in a variety of applications, from home construction to commercial buildings to industrial products. The products can be used for joists and beams that replace steel in many building projects or as flooring. Chemtech will manufacturer both Oriented Strand Board (OSB) and Medium Density Fiberboard (MDF) that will be used with Veneers.

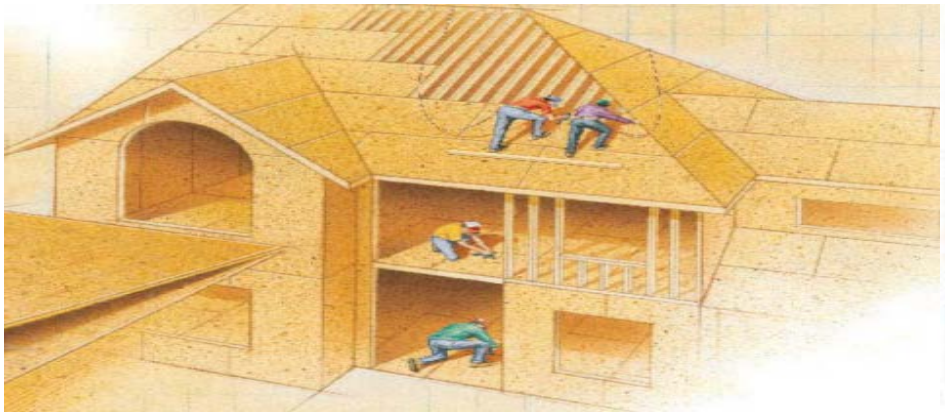
The types of adhesives used in engineered wood include:

Urea-formaldehyde resins (UF): most common, cheapest, and not waterproof.

•Phenol formaldehyde resins (PF): Commonly used for exterior outdoor products.

•Melamine-formaldehyde resins (MF): Heat and water resistant, and often used in exposed surfaces more.

Key Applications of Chemtech Manufactured Products – Oriented Strand Board



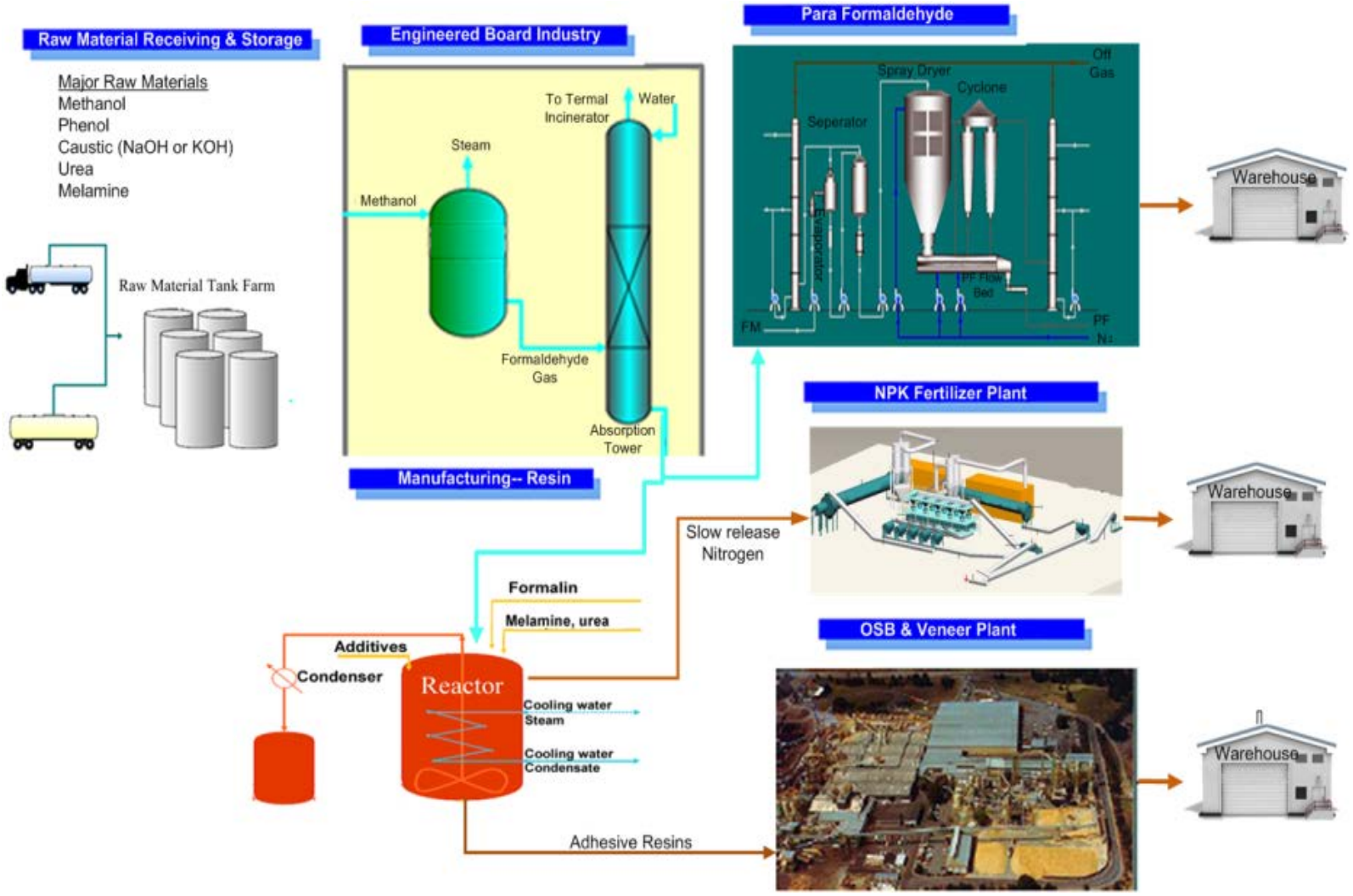
Key Applications of Chemtech Manufactured Products - Fertilizers

Chemtech will produce two types of fertilizer products:

Sulphur Coated Urea (SCU) fertilizers are a group of controlled release fertilizers consisting of prills of urea coated in less -soluble chemicals such as sulfur, polymers, other products or a combination. These fertilizers mitigate some of the negative aspects of urea fertilization, such as fertilizer burn. The coatings release the urea either when penetrated by water, as with sulfur, or when broken down, as with polymers. Most slow-release fertilizers are derivatives of urea, a straight fertilizer providing nitrogen. Isobutylidenediurea ("IBDU") and urea-formaldehyde slowly convert in the soil to free urea, which is rapidly uptaken by plants.

NPK Fertilizers are comprised of a mix of Nitrogen, Phosphorous, and Potassium blended in various proportions depending on the specific use of the NPK. For example, a fertilizer labeled as 20-6-8 has 20% nitrogen, 6% phosphorus and 8% potassium. The remaining percent is everything else that is in the mix. Nitrogen, phosphorus and potassium are often referred to as the “big three” for the vital growth and health of plants. Nitrogen contributes to healthy stem and leaf growth, phosphorus aids is root growth and flower and seed production, and potassium contributes to overall health and disease resistance.

Chemical Processing



Chemtech processes Paraformaldehyde for use in manufacturing its end products under three major chemical processes:

1. Concentration
    - Fresh formalin solution at 40% concentration is pumped to a first stage evaporator. The evaporator creates a condensate that concentrates the Formalin to 69%.

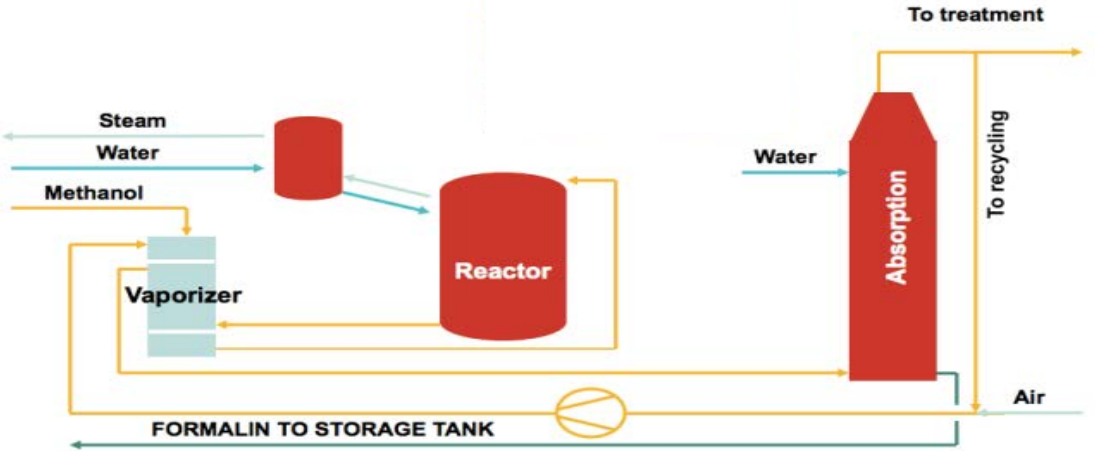
•Concentrated fluid is fed to a second stage evaporator. At this step, the formalin solution is concentrated to 85%

2. Fluid Bed Drying

•The highly concentrated formalin solution （85% is fed into a spray pelletizing tower and condensing room.
After pelletizing, the semi-formed product is fed into a fluid bed dryer to produce paraformaldehyde

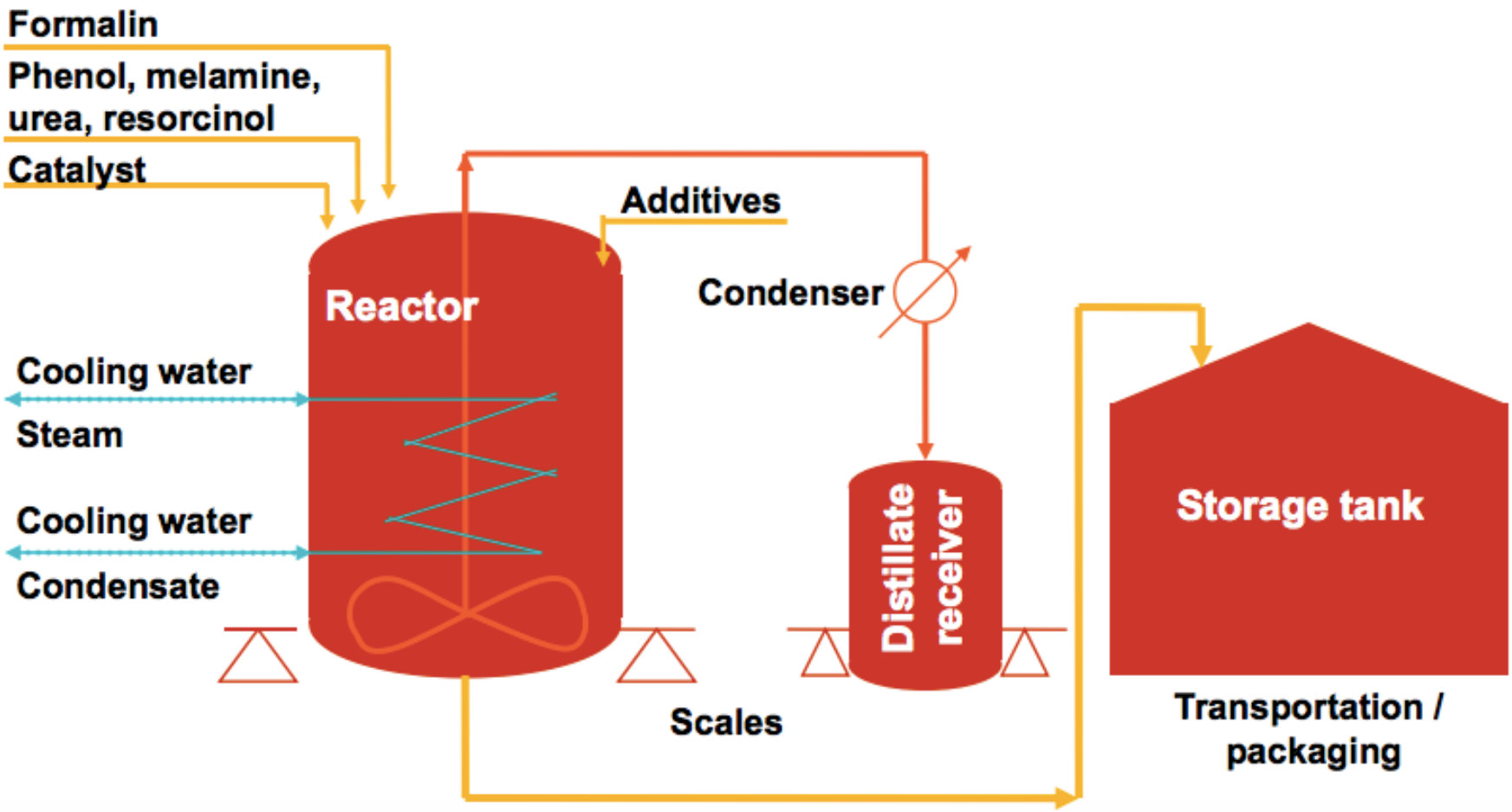
3. Scrubbing and Exhaust Gas Disposal

•During the pelletizing process vapor is vented out from the spray pelletizing tower and fluid bed dryer
•This is treated in a rotary fan separator for further production of residual paraformaldehyde
•Recycled gas from the separator is passed through a scrubber and any residual formalin is held in a storage tank for further recycle as feed stock
•Residual nitrogen b=gas is mixed with oxygen exhausted out after passing a bag filter and scrubber.



End Product Manufacturing - Adhesive Resin Manufacturing Process

After the formaldehyde is made, it is then processed in a reactor with additives and cooling water to make adhesives that are applicable to various types of wood such as the veneer boards and oriented strand boards.



Benefits for Guyana

- Employment generation
  - 750 construction employees –
  300 permanent employees
- Capital investment ~ US$200 Million (Integrated Chemical Complex) •
  Adding value to natural resources (lumber, agriculture etc.)
- Linking energy to manufacturing
- Integrated petrochemical complex: Guyana endowed with complementary natural resources which can be combined in several business ventures in the value added chains of timber logging and processing, petroleum, natural gas, mining and processing, including the relevant downstream industries and trading thereof respectively.

PROJECT STATUS

- No Objection letters from GOINVEST/REGIONAL DEMOTRACTIC COUNCIL
- Proposed site Identified –
- Technology – Identified
- EPC and Financing – Identified
- Marketing - Identified
- Construction period ~ (oil Refinery 24/30 months) Integrated Complex 18/24 months

- Contact Info: Email: sa7678426@gmail.com Tel: 592 624 0721 / 832 997 0981

Potential Accident Scenarios and Preliminary Screening

Process	Possible Accidents	Screening Decision
Entire Site	Conventional accidents involving worker injuries	The operation of this plant is not different from other standard chemical plants. The design and operation of the plant follows internationally accepted codes and standards. Health and safety measures and standard operating procedures are prepared and implemented to reduce the probability and severity of the consequences of potential workplace accidents. Fire safety plan and emergency response plan are prepared to adequately handle the emergency situations. The fire safety systems are designed implemented and tested routinely according to the process needs. The The personnel are adequately trained for working with hazardous materials and equipped with the appropriate personal protection equipment (PPE). This scenario does not need further assessment.
	Traffic accidents (such as collision, roll over, derailment or collision of trains) resulting in potential release of chemicals, human injuries and property damage	Traffic safety measures, such as speed limit, adequate signing, and drivers training are in place to minimize traffic accidents on site. The consequence of onsite traffic accident is expected to be low. The consequence of spill of chemicals during onsite traffic accident is bounded by the spill of chemicals from process operation. This scenario does not need further assessment.
	Transformer fire	The consequences of potential transformer fire are bounded by the chemical fire such as methanol and formaldehyde fires. The quantity of such materials stored on site is much larger. This scenario does not need further assessment.

Process	Possible Accidents	Screening Decision
Formaldehyde Chemical Plant	Release of methanol	The small scale release of methanol from storage tank can be contained and cleaned easily. In addition, the storage tanks will be of stainless steel construction to prevent corrosion and will be equipped with secondary containment to serve as multiple barriers against release to the environment. The potential consequences will be limited within the site boundary. The site drainage system will be designed to conduct all the surface runoff toward the detention pond in the south side of the facility. There would be no discharge to the environment. The probability of catastrophic failure of large stainless steel storage tank (250 m^3) resulting in release of large amount of methanol is much less than 10^{-5} per year (TNO 2005). Therefore according to the risk matrix provided in section 2.2, the risk is low. This scenario does not need further assessment.
	Fire involving liquid methanol	The thermal radiation resulting from large scale methanol fire could be high. This scenario was selected as bounding for further analysis.

	Release of formaldehyde solution	The small scale release formaldehyde from storage tank can be contained and cleaned easily. In addition, the storage tanks will be of stainless steel construction to prevent corrosion and will be equipped with secondary containment to serve as multiple barriers against release to the environment. The potential consequences will be limited within the site boundary. The site drainage system will be designed to conduct all the surface runoff toward the detention pond in the south side of the facility. There would be no discharge to the environment. The probability of catastrophic failure of large stainless steel storage tank (300 m^3) resulting in release of large amount of formaldehyde is much less than 10^{-5} per year (TNO 2005). Therefore according to the risk matrix provided in section 2.2, the risk is low. This scenario does not need further assessment.
Process	**Possible Accidents**	**Screening Decision**
	Boiler explosion	The explosion of the boiler is a very low probability event (CCPS 19890. The regular and preventive maintenance programs, in addition to regular testing and inspection would prevent unexpected failure of the boiler vessel. Any potential explosion of the boiler may have onsite consequences such as injuries or even fatality. However, given the preventive measures and considering the very low probability of such events, the risk of such event is deemed as low. The adverse consequences offsite is not expected. This scenario does not need further assessment.
	Fire involving formaldehyde solution	The thermal radiation resulting from large scale formaldehyde fire could be high. This scenario was selected as bounding for further analysis.

	Release of hydrogen to air and consequent fire ball	The thermal radiation resulting from large scale hydrogen fire could be high. This scenario was selected as bounding for further analysis.
	Release of carbon monoxide to air with toxic effects	Carbon monoxide is both toxic and flammable. The release of carbon monoxide may have adverse consequences offsite. This scenario was selected as bounding for further analysis.
	Release of carbon monoxide to air and consequence fire ball	Carbon monoxide is both toxic and flammable. The release and fire involving carbon monoxide may have adverse consequences offsite. This scenario was selected as bounding for further analysis.
	Release of methanol vapour and consequent BLEVE	The thermal radiation resulting from large scale methanol fire could be high. This scenario was selected as bounding for further analysis.
	Release of formaldehyde vapour and consequent BLEVE	The thermal radiation resulting from large scale methanol fire could be high. This scenario was selected as bounding for further analysis.
	Offsite vapour cloud explosion from hydrogen release	The blast overpressure resulting from large scale hydrogen explosion could be high. This scenario was selected as bounding for further analysis.
Process	**Possible Accidents**	**Screening Decision**
	Offsite vapour cloud explosion from methanol vapour release	The blast overpressure resulting from large scale methanol explosion could be high. This scenario was selected as bounding for further analysis.
	Offsite vapour cloud explosion from formaldehyde vapour release	The blast overpressure resulting from large scale formaldehyde explosion could be high. This scenario was selected as bounding for further analysis.

Para-Formaldehyde Chemical Plant	Release of formaldehyde solution	The small scale release of formaldehyde from storage tanks can be contained and cleaned easily. In addition, the storage tanks will be of stainless steel construction to prevent corrosion and will be equipped with secondary containment to serve as multiple barriers against release to the environment. The potential consequences will be limited within the site boundary. The site drainage system will be designed to conduct all the surface runoff toward the detention pond in the south side of the facility. There would be no discharge to the environment. The probability of catastrophic failure of large stainless steel storage tank resulting in release of large amount of formaldehyde is much less than 10^{-5} per year (TNO 2005). Therefore according to the risk matrix provided in section 2.2, the risk is low. This scenario does not need further assessment.
	Fire involving formaldehyde solution	This scenario is bounded by the formaldehyde fire in the formaldehyde plant.
	Release of formaldehyde vapour and consequence fire ball or Boiling Liquid Expanding Vapor Explosion (BLEVE)	This scenario is bounded by the release of formaldehyde vapour from formaldehyde plant and consequence fire ball or BLEVE.
	Offsite vapour cloud explosion from formaldehyde vapour release	This scenario is bounded by the offsite vapour cloud explosion involving formaldehyde vapour released from formaldehyde plant and consequence fire ball or BLEVE.
Nitrogen Fertilizer Plant	Spill of solid chemicals (e.g. urea)	Any spill of solid material on site can be contained and cleaned immediately. The emergency response plan has procedures for handling a chemical spill. Any waste generated during the clean up can be recycled internally of disposed off safely according to the plant procedures. This scenario does not need further assessment.

Process	Possible Accidents	Screening Decision
	Ammonium nitrate explosion	Dust explosion in industry is a rare accident; however the consequences could be severe. These consequences are mostly onsite. Offsite consequences are not expected. Proper grounding of the process equipment, housekeeping, regular cleaning of the building and equipment (e.g. hoppers, ducts, pipes, vents) that may accumulate the explosive dust, proper design of the process will effectively prevent dust explosion. According to risk matrix provided in Section 2.2, the risk is deemed to be low. This scenario does not need further assessment.
Oriented Strand Board Plant	Wood fire	The magnitude of the consequence of a wood fire is expected to be bounded by a chemical fire. This scenario does not need further assessment.
	Saw dust explosion	Dust explosion in industry is a rare accident; however the consequences could be severe. These consequences are mostly onsite. Offsite consequences are not expected. Proper grounding of the process equipment, housekeeping, regular cleaning of the building and equipment (e.g. hoppers, ducts, pipes, vents) that may accumulate the explosive dust, proper design of the process will effectively prevent dust explosion. According to risk matrix provided in Section 2.2, the risk is deemed to be low. This scenario does not need further assessment.

	Spill of resins	Any small scale spill of solid or liquid materials such as resins on site can be contained and cleaned immediately. The emergency response plan has procedures for handling chemical spills. Any waste generated during the clean up can be recycled internally or disposed off safely according to the plant procedures. This scenario does not need further assessment.
Veneer Plant	Wood fire	The magnitude of the consequence of a wood fir is expected to be bounded by a chemical fire. This scenario does not need further assessment.
Process	**Possible Accidents**	**Screening Decision**
	Saw dust explosion	Dust explosion in industry is a rare accident; however the consequences could be severe. These consequences are mostly onsite. Offsite consequences are not expected. Proper grounding of the process equipment, housekeeping, regular cleaning of the building and equipment (e.g. hoppers, ducts, pipes, vents) that may accumulate the explosive dust, proper design of the process will effectively prevent dust explosion. According to risk matrix provided in Section 2.2, the risk is deemed to be low. This scenario does not need further assessment.

Resin Plant	Spill of resins	Any small scale spill of solid or liquid materials such as resins on site can be contained and cleaned immediately. The emergency response plan has procedures for handling chemical spills. Any waste generated during the clean up can be recycled internally of disposed off safely according to the plant procedures. This scenario does not need further assessment.
Process	**Possible Accidents**	**Screening Decision**
	Release of phenol/resorcinol from storage tank	The release of phenol/resorcinol from storage tank can be contained and cleaned easily. The waste generated during the process can be collected and disposed of safely according to the plant procedures. In addition, the storage tanks are equipped with secondary containment to serve as multiple barriers against release to the environment. The potential consequences are limited within the site boundary. The site drainage system is designed to conduct all the surface runoff toward the detention pond in the south side of the facility. There would be no discharge to the environment. The probability of catastrophic failure of large storage tank resulting in release of large amount of phenol/resorcinol is in the order of 10^{-5} per year. Therefore according to the risk matrix provided in section 2.2, the risk is low. The workers responding to the phenol/resorcinol release will be equipped with the adequate personal protection equipment such as full-face masks to reduce the risk of exposure and human health adverse effects on the workers. This scenario does not need further assessment.

	Release of phenol/resorcinol during a fire	Due to high boiling point (~182ºC) evaporation of phenol and dispersion offsite is very unlikely, however, the thermal radiation resulting from large scale phenol fire could be high. This scenario was selected as bounding for further analysis. Due to higher flash point of resorcinol (127ºC) compared with the flash point of phenol (79ºC), the consequence and probability of a resorcinol fire is bounded by those of a phenol fire.
Process	**Possible Accidents**	**Screening Decision**
	Melamine dust explosion	Dust explosion in industry is a rare accident; however the consequences could be severe. These consequences are mostly onsite. Offsite consequences are not expected. In the plant: • deposition of dust will be prevented; • when excessive dusting is expected, closed system will be used; and • dust explosion-proof electrical equipment and lighting will be used in the area that the dust explosion is probable. In addition, proper grounding of the process equipment, housekeeping, regular cleaning of the building and equipment (e.g. hoppers, ducts, pipes, vents) that may accumulate the explosive dust, proper design of the process will effectively prevent dust explosion. According to risk matrix provided in Section 2.2, the risk is deemed to be low. This scenario does not need further assessment.