2life

Hygimed
Saving the Environment

Hygimed Deashing

Deep processing equipment for CB from tires pyrolysis

2025

About EWA technologies group

EWA Technologies Group (GEWA), represented in France, UK and the Caribbean Island by 2life, formally established in January 2016 as a research and development enterprise, followed more than 20 years of experience in the field of environmental microbiology and medical sanitation, solid waste to energy and smart agricultural. EWA Group having activities in China and Asia-Pacific, Europe, Africa and Latin America. GEWA products sold under the brands name Hygimed® or IQS. EWA Group constantly developing and innovating, pursuing quality and gaining recognition from the industry with scientific strength. All GEWA's original products meet global standard, certified by CE and ISO.

EWA TECHNOLOGIES GROUP

for better future

EWA Group is active mainly in 3 fields:

Environmental field:

- Pyrolysis, Gasification and biogas technologies for W2E applications
- MSW sorting and recycling systems
- Hygimed Deashing for production high quality of rCB and activated carbon from waste.

Medical field:

- Hygimed OnSite, PY Med and Hygimed Mobile for medical waste treatment and recycling.
- Hygimed electrolyzed disinfection generator

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Saving the Environment

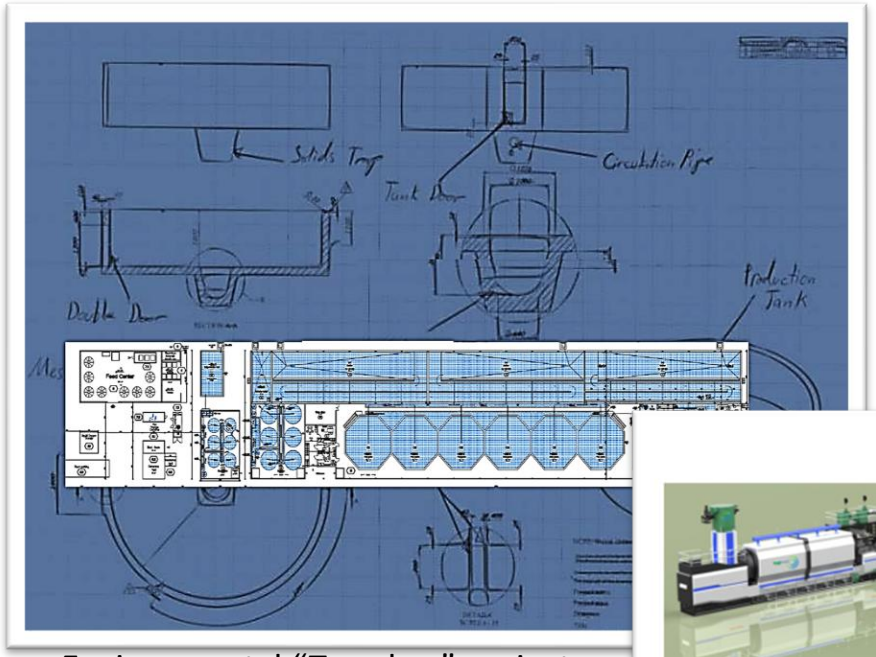
Agriculture field:

- Electrolyzed water generator for organic disease-control in agriculture.
- Biochar-based granulated organic fertilizer

EWA TECHNOLOGIES GROUP

Saving the environment

PROFESSIONAL IN WASTE TO ENERGY AND SOLID WASTE MANAGEMENT, SORTING AND RECYCLING SOLUTIONS



Environmental “Turn-key” projects

MSW sorting systems

Medical waste management, treatment and recycling

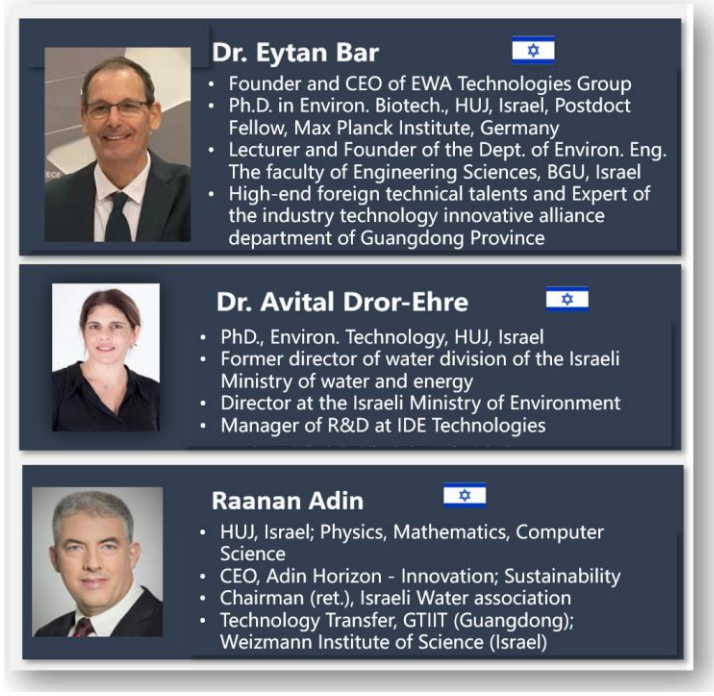
Waste to clean Energy

Bio-digestion

Valorization of Organic waste to Granulated organic fertilizer

Our members and global activities

Our management and expert team



Dr. Eytan Bar

- Founder and CEO of EWA Technologies Group
- Ph.D. in Environ. Biotech., HUJ, Israel, Postdoct Fellow, Max Planck Institute, Germany
- Lecturer and Founder of the Dept. of Environ. Eng. The faculty of Engineering Sciences, BGU, Israel
- High-end foreign technical talents and Expert of the industry technology innovative alliance department of Guangdong Province

Dr. Avital Dror-Ehre

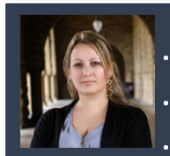
- PhD., Environ. Technology, HUJ, Israel
- Former director of water division of the Israeli Ministry of water and energy
- Director at the Israeli Ministry of Environment
- Manager of R&D at IDE Technologies

Raanan Adin

- HUJ, Israel; Physics, Mathematics, Computer Science
- CEO, Adin Horizon - Innovation; Sustainability
- Chairman (ret.), Israeli Water association
- Technology Transfer, GTIIT (Guangdong); Weizmann Institute of Science (Israel)

Dr. Jean-Christophe Henry

- PhD of Environmental Science
- Technical Adviser to the Ministry of the Environ.
- Former UNESCO International Consultant
- Expert in invasive plants

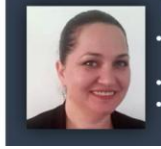


Noy Bar

- MBA (specializing in innovative technologies), LLB, and Software engineering
- 10+ year as BD, PM and strategic partnerships at Fortune 500 companies.
- Founder and CEO of Thunderact (USA)

Shimon Kashti

- Economist, mathematician
- President of the Academic Askelon College
- CEO & Chaiman of IQS Global (UK) and CEO of IIB Technologies (UK).
- Chairman of IQS Innovation (Romania/Israel)



Ilanit Metzuyanim - Melman

- MSc, Environmental Engineering, BGU Israel, Biotech Eng., Founder, Ariel Uni.
- Director and founder of of RICETO FQ, Israel-China
- Manager of Public Health at Israeli Ministry of Health

Hygimed

Saving the Environment

EWA TECHNOLOGIES GROUP

Saving the environment for the next generations

A Greenway Revolution 2life

Summary

EWA Technologies Group offers a cutting-edge technological solution for the valorization of tires, plastics, used oil, and biomass into energy and carbon-based products (including recycled carbon black [rCB], activated carbon, and biochar). This innovative approach emphasizes a low-carbon-emission process that converts waste into energy, ensuring a minimal environmental footprint. Our process operates in an air-free environment, preventing any contact between the treated materials and the atmosphere, thus eliminating the potential for polluting emissions or the discharge of toxic substances. Using a thermal process, we generate hydrogen-rich synthetic gas produced internally, which facilitates the recycling of plastics, rubber tires, used motor oil, and biomass. The outcome of our valorization process includes synthetic fuel (specifically non-standard synthetic diesel), recovered carbon black (rCB) used in tire production, and carbon briquettes or biochar. This method is environmentally friendly, characterized by its low environmental impact, zero water and solid discharge, and extremely low carbon emissions. Notably, the process is self-sustaining (autothermic), requiring no external heating power.

Business Example

For instance, if we are recycling 1,800 tons of tires, 6,000 tons of plastics, and 3,000 tons of used motor oil annually, we expect to produce 6,000 tons of synthetic fuel per year, priced at $650 per ton, generating an estimated income of $3.9 million. Additionally, we anticipate producing 460 tons of rCB per year, valued between $2,000 and $3,400 per ton, as well as 1,800 tons of carbon for briquettes or biochar, with a market price of approximately $350 per ton. Consequently, the projected annual revenue from carbon-based products at full capacity is approximately $9.2 million.

According to our profit/loss analysis, the total annual profit from fuel production (pyrolysis and distillation) is projected at $2.85 million, yielding an EBITDA of 91% of the fuel activity income. The annual profit from carbon-based products (rCB and carbon briquettes/biochar) is estimated at $5.87 million, representing an EBITDA of 63.6% of the revenue from these activities.

The total investment for machinery and equipment (excluding infrastructure) is $936,000, with an estimated total annual EBITDA of $8.72 million for the enterprise. Based on our analysis, the return on investment (ROI) is anticipated within 4-5 months from the initial production payment. This embodies the essence of what we call a "Greenway Revolution 2Life."

PROJECT BACKGROUND

Recycled Carbon Black (rCB), when added to synthetic rubber during new tire manufacturing, significantly extends the tire's lifespan, increases tensile strength, tear resistance, and wear resistance, and prolongs the service life of rubber products. Accordingly, rCB produced through the pyrolysis decomposition of scrap tires has become a commercially attractive product.

The most valuable product of tire pyrolysis is rCB. However, additives such as silica, introduced during the tire production process, result in the formation of a high ash content in the rCB. This high ash content (averaging 18% or more, and sometimes reaching as much as 27%) renders the rCB unusable and classifies it as hazardous waste.

To convert raw rCB into high-quality rCB, **deashing** is essential. The ash is primarily composed of zinc oxide, calcium carbonate, sulfide, silica, and other components that must be removed from the carbon matrix of the rCB. According to industry standards, the ash content must be reduced to less than 1%. Achieving this low ash content typically requires an expensive process that consumes high levels of energy and involves hazardous materials.

An effective deashing process can significantly increase the value of rCB, raising its price from approximately $100 for raw rCB to $850–$2,000 for pure rCB.

THIS IS WHAT OUR TECHNOLOGY ACHIEVES.

Raw CB

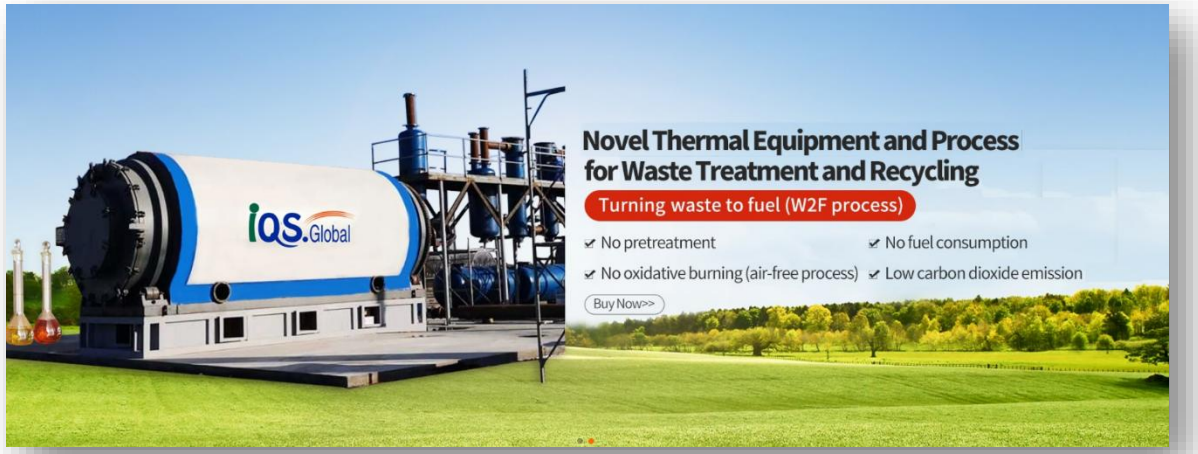
Hygimed Deashing

Purified rCB (N330)

Key numbers (example for process of 24T CB/day):

- US$250,000 investment
- 24T pCB daily process
- output 19.68T/rCB day
- US$1,086 sale price/ton rCB standard N330/N550
- US$703,520 monthly income
- US$525,500monthly profit (EBIDTA)
- **US$6.6 million annual profit (EBIDTA)**

THE TIRES CYCLE



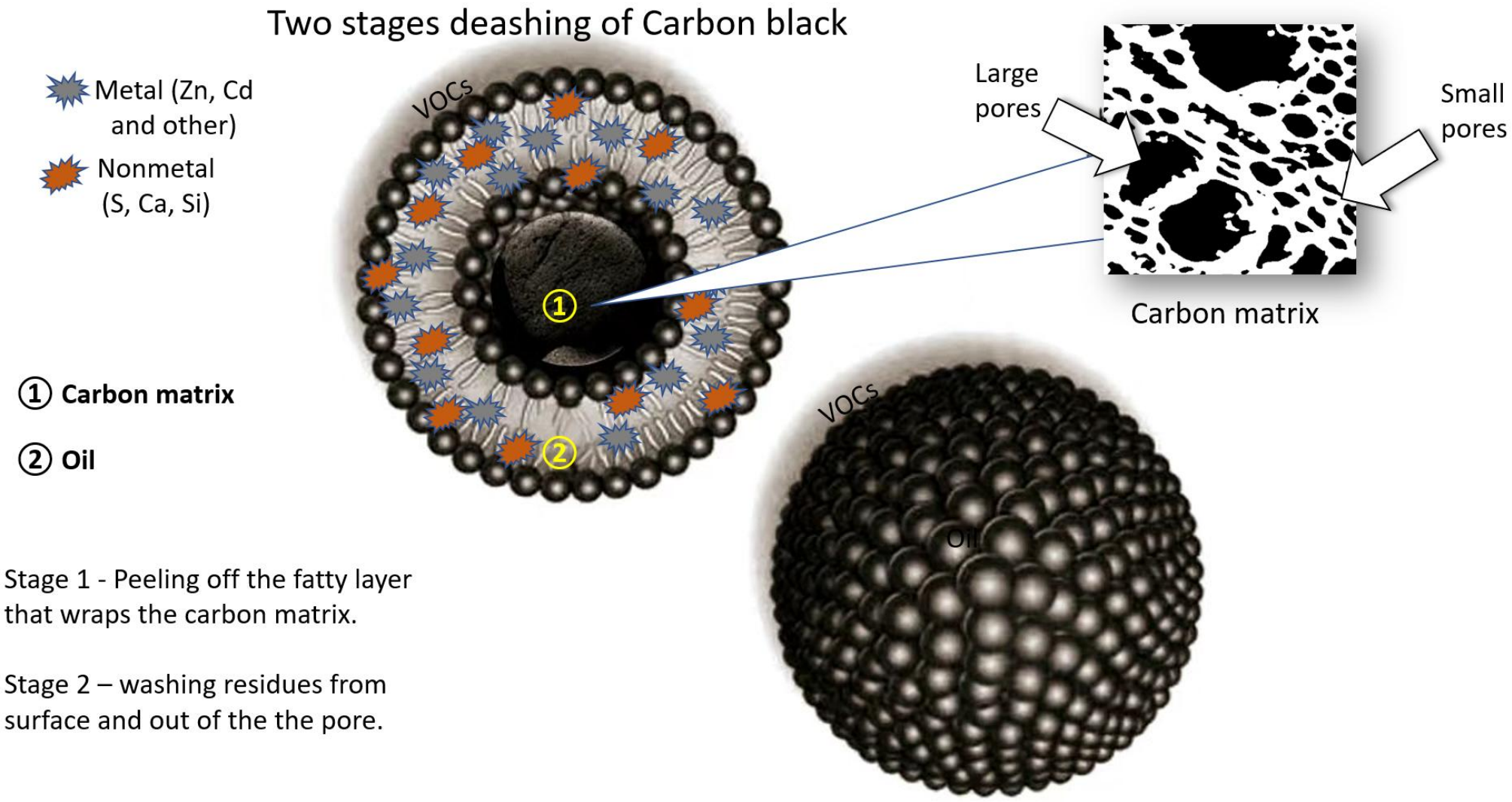
here we are

Raw rCB

Oil

Steel

The Technology



Combination of physical power with chemical composition is in the basis of our technology.

Hygimed Deashing Compare with ordinary industrial production

Carbon Black (CB) in Tire Manufacturing

Carbon black (CB) is a critical component in the production of tires. CB can be categorized into primary carbon black (pCB), virgin carbon black (vCB), recycled carbon black (rCB), and other forms. The industrial processing of CB takes place under extreme heat conditions, requiring the burning of large amounts of fossil fuels, which generates substantial carbon emissions and contributes to environmental damage.

Recycled Carbon Black (rCB) in Tires

Recycled carbon black (rCB) can be used as an additive in rubber for tire manufacturing. This addition significantly improves the wear resistance and strength of tires. Beyond reinforcing tires, rCB also absorbs ultraviolet (UV) rays, helping to prevent damage caused by UV-induced rubber decomposition. Furthermore, rCB acts as an ozone scavenger, protecting tires from oxidation damage.

Purification of Recycled Carbon Black (rCB)

The purification process of rCB involves removing impurities and volatile organic compounds (VOCs) from the surface of the carbon matrix using chemical and physical methods. However, extracting impurities and VOCs from the carbon pores is particularly challenging and typically requires extreme physical processes or the use of aggressive chemicals.

The reliance on extreme physical methods entails high energy consumption and elevated temperatures (ranging from 1000–1800° C), which results in significant carbon emissions, as well as the release of nitrogen oxides (NOx) and sulfur oxides (SOx). On the other hand, chemical processes usually involve strong acids, such as hydrochloric, nitric, and sulfuric acid, applied under high pressures. While these chemical methods may reduce the need for high temperatures, they generate hazardous waste and create a dangerous working environment.

Hygimed Deashing Technology

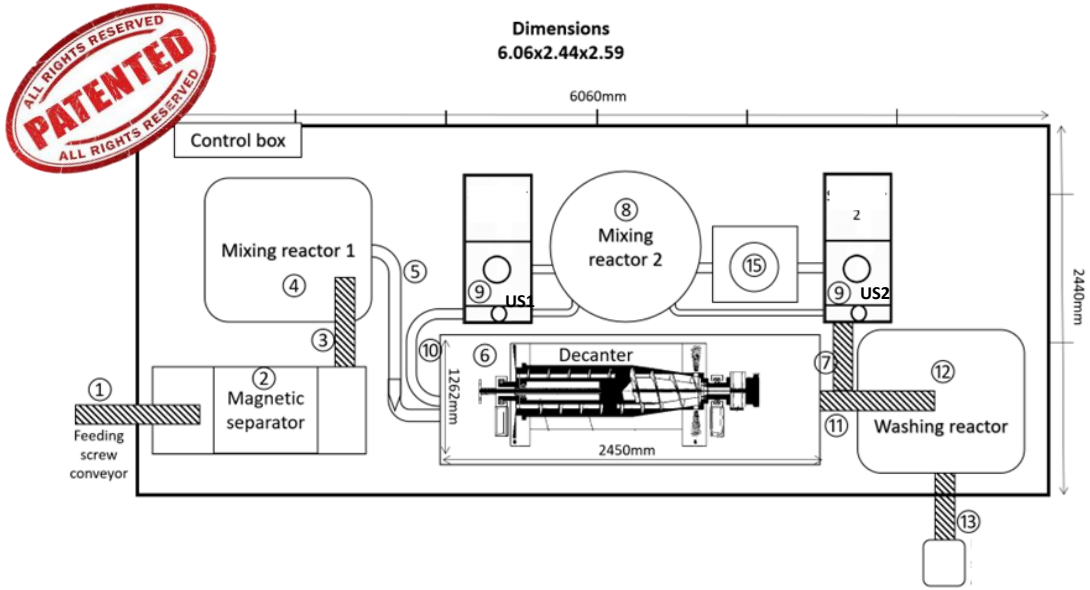
Our Hygimed Deashing technology addresses the environmental concerns and risks associated with traditional industrial processes while also significantly reducing production costs. This innovative technology provides a cleaner and safer alternative for the purification of recycled carbon black (rCB), making it a more sustainable and cost-effective solution for tire manufacturing.

Parameter	Industrial scale process	Hygimed Deashing
Electricity consumption	High	Low
Heat	Very high	Very low (only for drying)
Carbon emission	Very high	Very low
NOx, SOx	Very high	None
Infrastructure	High investment	Simple and low cost
Mobility	No	Yes
Upscaling	Complicate and expensive	Modular
Hazardous waste	High	None
Operation Cost	Very high	Very low
Capital investment	Very high	low
Environmental protection ranking	1	10

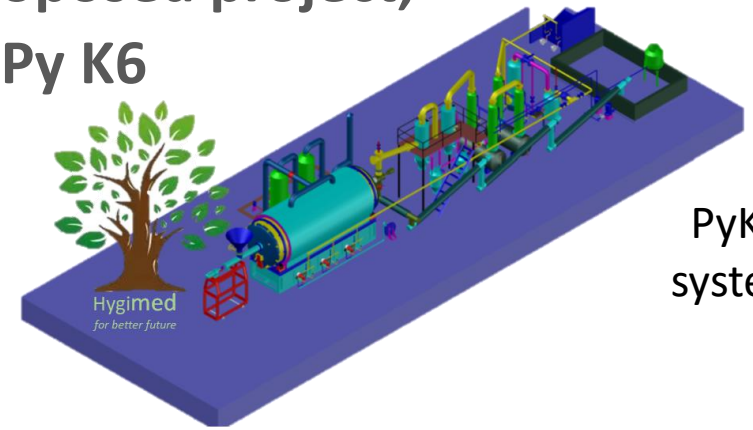
The Technology

Three stages process, combination of 2 complementary solutions and 3 powerful physical equipment enable washing the ash for final level of less than 0.3%, as demand by the standard. No heating, no aggressive chemical and no harmful residues, continuous process of 3hrs wash the ash from the external and internal sides of the carbon matrix. The technology is suitable for small scale equipment for on-site application, as well as large scale plant. The invention which is in the basis of the technology, took in consideration the nature of the CB particle, which is composed of the purposive carbon matrix. After process, the washed rCB is transfer into horizontal turning reactor for drying.

The small scale equipment, pack in a frame of 20” container. The second size, also pack in frame of 20” container, can treat one ton CB/h. Bigger equipment are tailor made design.



Example for proposed project, including mini Py K6



PyK6 system

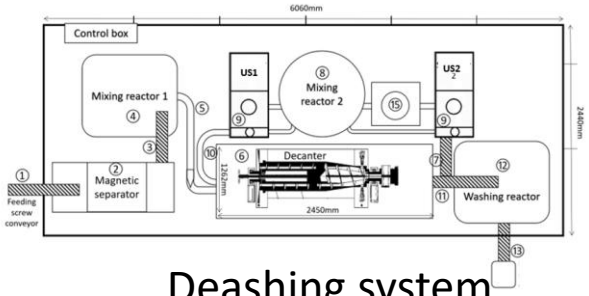
Fuel 3T/d

Heat
230kg fuel
(~10,000Mj)

19.7T solid/d
+6T water

Pretreatment – feeding (optional)

24T/d



Deashing system (1T/h)

Dryer

19.7T solid/d

24T/d
(24kW)

RO/ED system

Packaging

Example of our results after treatment

SPECIFICATION SHEET

CARBON BLACK N330

CAS NO.: 1333-86-4

Specifications:

VARIOUS INDICATORS		LIMIT	METHOD
Iodine absorption	mg/g	82±5	ASTM D 1510
DBP absorption	ml/100g	102±5	ASTM D 2414
CDBP absorption	ml/100g	83~93	ASTM D 3493
CTAB	m^2/g	76~88	ASTM D 3765
NSA	m^2/g	73~83	ASTM D 6556
STSA	m^2/g	75±5	ASTM D 6556
Tint strength	%	99~109	ASTM D 3265
300% Modulus(IRB7#)	MPa	-0.9±1.0	ASTM D 3192
Sieve analysis on 45um	%	≤0.05	ASTM D1514
Sieve analysis on 500um	%	≤0.0010	ASTM D 1514
Pour Density	kg/m^3	380±40	ASTM D 1513
Loss at 125℃ (big bags)	%	≤2.5	ASTM D 1509
Ashes	%	≤0.7	ASTM D 1506
Pellet Hardness（mv n=20） cN		15～45	ASTM D 3313
Fines Content (paper bags)	%	≤10.0	ASTM D 1508
Toluene Discolouration	%	≥95	ASTM D 1618

P/L - Example for single site of 24T/h Hygimed Deashing units

Deashig 24T/day

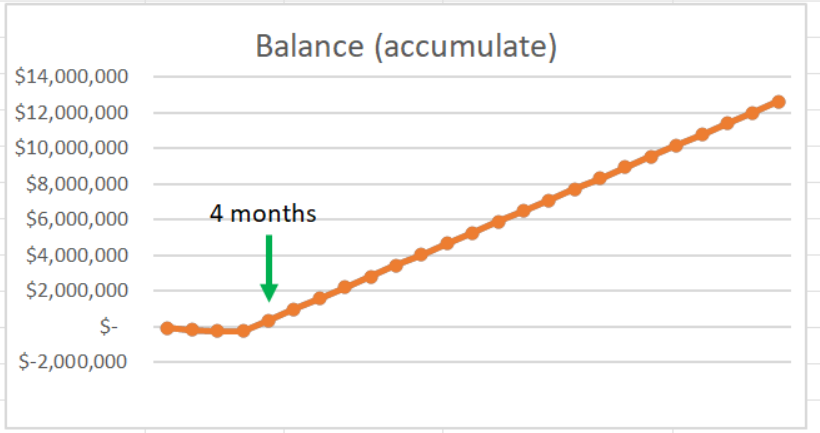
Investment

Hgimed deashing 1T/h	$ 178,571.43
Dryer	$ 12,714.29
RO/ED	$ 6,000.00
Packaging machine	$ 8,142.86
Infrastructure	$ 7,142.86
Installation and delivery	$ 12,857.14
Total	**$ 225,428.57**
Engineering and unexpected (10% of total)	$ 22,542.86
Total investment	**$ 247,971.43**

Value of Zn was calculated as 0
Purchase price of raw CB added as 0
Market price of rCB was added as $1,324, according to SunSirs
All prices are based on Chinese market prices

Income and operating expenses

	Quantity/ Day/T	Price/T	Sales/ Month	Sales/YEAR
Carbon Black	24	$ 1,085.68	$ 703,520.64	$ 7,738,727.04
Zn	0	$ -	$ -	$ -
TOTAL			**$ 703,520.64**	**$ 7,738,727.04**
	Quantity	**Cost/day/u**	**COST/ Month**	**COST/YEAR**
Employees	4	$ 42.86	$ (4,628.57)	$ (55,542.86)
Management	1	$ 317.14	$ (8,562.86)	$ (102,754.29)
Electricity	175	$ 0.14	$ (675.00)	$ (8,100.00)
Gas	451	$ 0.61	$ (7,445.37)	$ (89,344.39)
Purchse pCB	24	$ -	$ -	$ -
Chemical and disposable	24	$ 107.14	$ (69,428.57)	$ (833,142.86)
TOTAL			**$ (90,740.37)**	**$ (1,088,884.39)**
EBIDTA			**$ 612,780.27**	**$ 6,649,842.65**



ROI

Balance accumulate	Month
$ -82,657	0
$ -165,314	1
$ -247,971	2
$ -247,971	3
$ 364,809	4
$ 977,589	5
$ 1,590,369	6
$ 2,203,150	7
$ 2,815,930	8
$ 3,428,710	9
$ 4,041,490	10
$ 4,654,271	11
$ 5,267,051	12
$ 5,879,831	13
$ 6,492,612	14
$ 7,105,392	15
$ 7,718,172	16
$ 8,330,952	17
$ 8,943,733	18
$ 9,556,513	19
$ 10,169,293	20
$ 10,782,074	21
$ 11,394,854	22
$ 12,007,634	23
$ 12,620,414	24

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WE THANK YOU FOR YOUR ATTENTION

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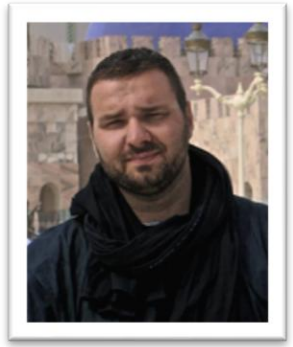

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