



Driving Sustainable Future

Environmental Issues Caused by Waste Tires



Environmental Issue

About 13.5 million tons of waste tires are generated worldwide every year, and about 300,000 tons are generated every year in Korea. About 50% of waste tires are landfilled, causing soil and water pollution that are hazardous to environment. The remaining 50% is recycled, most of which is burned as fuel, causing serious air pollution and carbon emissions.

What is Sustainable Carbon Black?



Sustainability

Strengthening corporate social responsibility



CO₂ Reduction

Resolving global environmental issues



Cost Saving

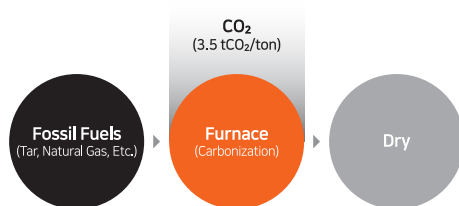
Price competitiveness compared to Virgin Carbon Black products



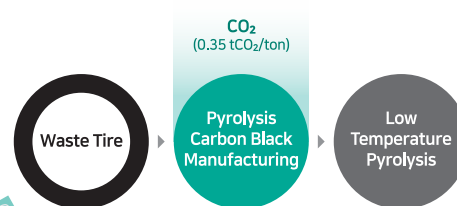
Performance

Substitute Performance of Recovered Carbon Black products

Virgin Carbon Black Manufacturing Process



Green Carbon Manufacturing Process



End of Life
Tire Issue



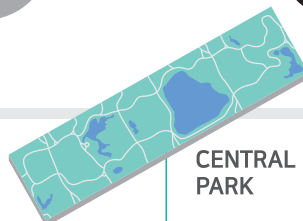
CO₂ ↑

13.5 Million tons/year of
Waste Tires are Generated

- About 1.5 billion tires are discarded annually
- 1/2 of waste is burned or landfilled, causing environmental issues
- 932 kg CO₂ eq/ton ELT

About 25 Million tons of
CO₂ Generated Globally

- Virgin Carbon Black used in tire production
- Production of 7.2 million tons of Virgin Carbon Black



CENTRAL
PARK

LDC Standard
(99ton/day)
||
41million Plant
(33,000ha)

More than 90 times the size of
New York City, Central Park

Green
Carbon Black
Effect



CO₂ ↓

CO₂ Emission
Reduction Effect

- LDC Carbon Black Factory (33,000 ton/year)
- Standard 2 Million Trees
(Approximately 33,000 ha) Effect

Virgin Furnace Carbon Black
Reduced production

- About 30kt/yr crude oil resource saving



「LD Carbon」 Leading Company in Eco-Friendly Material Industry

**2021 Green New Deal
Promising Company 100**

Since its establishment in September 2017, LD Carbon (LDC) has been recycling resource materials. LDC reduces CO₂ emissions and usage of crude oil resources to solve environmental problems caused by waste tires for a sustainable future.

LD Carbon is a global leading company that manufactures eco-friendly chemical products.

LDC VISION

100%

Recycled
Feedstock

ALL

Revenue from
Up-cycled
Products

Zero

Net-Zero CO₂ or
Greenhouse Gas
Emission

"Contributing to economic development by leading the sustainable chemical industry and continuously expanding the market"

Mission Statement

1. A sustainable eco-friendly company that contributes to the transformation of the chemical industry into an eco-friendly industry, achieving Zero-Emission in all production processes
2. A company that enhances transparency in all areas of management and fulfills its social responsibilities in all areas of ESG as well as Eco-Friendliness

Patent

System and method for manufacturing Carbon Black by stagnation and regeneration of char through pyrolysis of waste tires [No.10-2022506, PCTKR2019016464]
System and method for manufacturing Carbon Black by stagnation and regeneration of char through pyrolysis of waste tires [No.10-2158753, PCTKR2018006631]
Tire tread rubber composition with improved tire braking performance [No.10-2180689]
Pelletizer and Carbon Black Manufacturing System From Waste Tire Comprising The Same [No. 10-2022-0155695]
Composition For Pelletizing Carbon Black Produced Through Thermal Decomposition From Waste Tire [No. 10-2022-0155697]
Carbon Black Manufacturing System and Method From Waste Tire Using Pyrolyzing [No. 10-2023-0003697]

Trademark Rights

Class 01 Carbon Black for rubber manufacturing or rubber processing 20 cases
GREENCARBON 330G [No. 40-1322599]
GREENCARBON 660G [No. 40-1322600]
GCB [No. 40-2021-0187967]
GCO [No. 40-2022-0170030]
LDC [No. 40-2022-0170033]

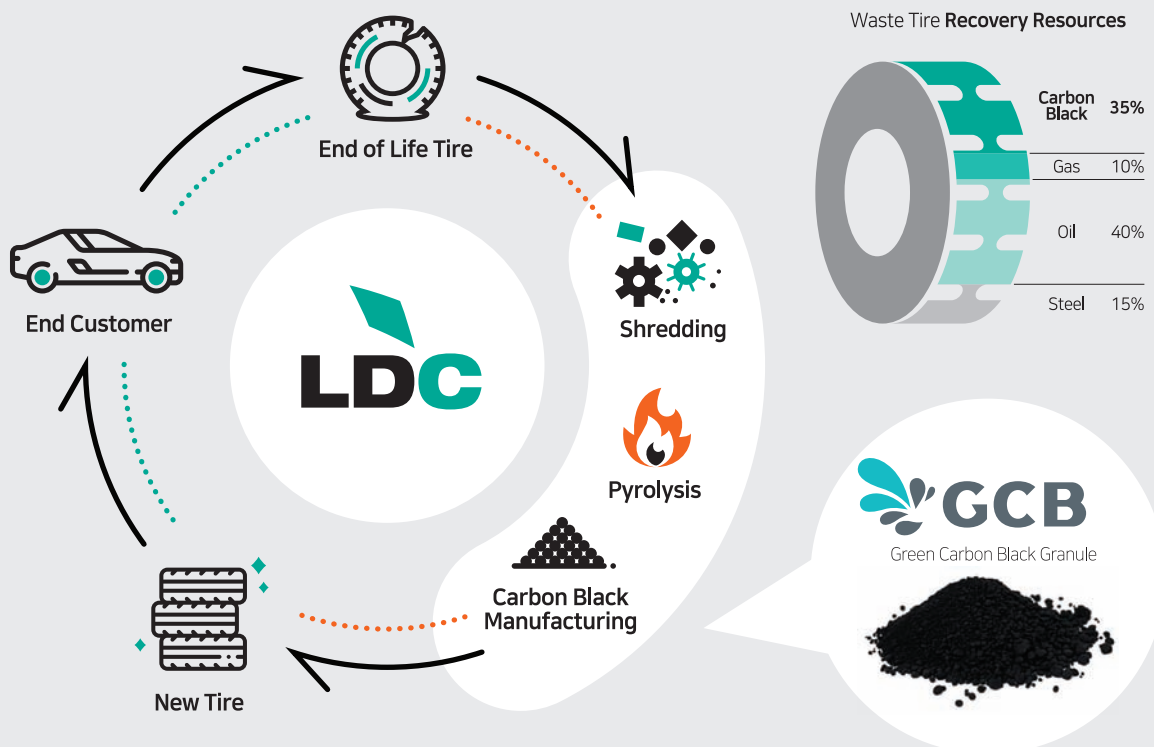
Certification

ISCC PLUS [ISCC-PLUS-Cert-DE105-88515602]
Green carbon (Green Carbon Black) manufacturing and additional services [ISO9001]
Green carbon (Green Carbon Black) manufacturing and additional services [ISO14000]

GCB

GCB (Green Carbon Black) is an eco-friendly product that can be continuously recycled by extracting carbon black from waste tires and using the extract as a raw material for tires and mechanical rubber products.

GCB (Green Carbon Black) is manufactured by refining, processing, and commercializing combustion residues(Char), gas, oil, and steel that are generated through pyrolysis after shredding waste tires.



Virgin Carbon Black		Particle Size Small(Hard)	Recovered Carbon Black - GCB
PCR Tread	TBR Tread	N110	- R&D Under Development
		N220	
		N330	
Steel Belt	Carcass & Sidewall	N550	- Tire : Innerliner - Compound Application : Sidewall - A Small Amount Of Compound Applied - Hose, Conveyor Belt - Industrial Rubber Product
		N660	
		N770	
Innerliner		N990	
		Large(Soft)	

GCB is (Sustainable Carbon Black) manufactured by pyrolysis. Semi-Reinforcing Grade for use in a varieties of industrial rubber compounds.



20kg Bag



1MT Bag

GCB -774G	Property	Unit	Specification	Test Method
	Ash Content	%	18.5±3.5	ASTM D1506
	Heat Loss	%	Max. 2.0	ASTM D1509
	Pellet Hardness	gf	Max. 80	ASTM D5230
	pH		6.5±1.5	ASTM D1512
	Sieve Residue	ppm	Max. 1,000	ASTM D1514
	Fines Content	%	Max. 1.0	ASTM D1508
	Toluene Discoloration	%T	Min. 10	ASTM D1618

GCB -600G	Property	Unit	Specification	Test Method
	Ash Content	%	17.5±2.5	ASTM D1506
	Heat Loss	%	Max. 2.0	ASTM D1509
	Pellet Hardness	gf	Max. 80	ASTM D5230
	pH		6.5±1.5	ASTM D1512
	Sieve Residue	ppm	Max. 300	ASTM D1514
	Fines Content	%	Max. 5	ASTM D1508
	Toluene Discoloration	%T	Min. 80	ASTM D1618

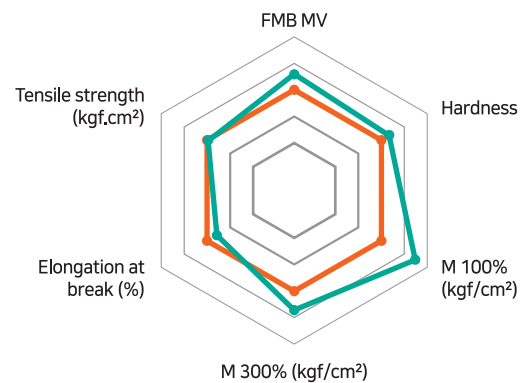
Application Compound Properties

GCB-774G
10 PHR addition

Division	Ref.	KS-GC
-	KS Standard	GCB-774G 10phr Addition
NR (SIR-20)	100	100
Carbon Black(N550)	60	60
Green C.B	-	10
TDAE (Oil)	5	5
Anti. Oxidant (TMQ)	1	1
ZnO	5	5
S/A	1	1
Sulfur	2.2	2.2
Acc. CBS	1.5	1.5
Cost Index	100	96.4

KS Standard

GCB-774G 10phr Addition



Inner Liner / Liner Backing Compound

GCB-774G
10PHR replacement

Contents		Inner Liner Compound		Liner Backing Compound	
Compound Property		REF N660 100%	GCB-774G 10 PHR replace	REF N660 100%	GCB-774G 10 PHR replace
s-s	Hardness	50	48	66	66
	M10% / M300%	3.8 / 26	3.8 / 27	6.7 / 148	6.9 / 155
	Elong. /T.S.	821 / 74	832 / 74	373 / 189	346 / 180
DMTS (60°C)	Tanδ @5% (Index)	100	104	100	105
FF	50% Residual Rate (Index)	100	98	100	96
DeMattia	Crack Growth	3.57 / 4.53	3.21 / 5.08	28.7 / 45.4	20.3 / 32.7
Penetration Gas	P (Gas Transmission Coefficient)	100	100	100	100



GCC

GCC (Green Carbon Char) is an ecofriendly solid fuel product (SRF) that is processed through anaerobic pyrolysis using waste tires as raw materials. Due to its high calorific value and excellent price competitiveness, it can replace existing coal and cokes.

Item	Division	Char	Unit
High Calorific Value		6,500-7,500	kcal/kg
Metal Components	Lead	36.4	mg/kg
	Copper	192.2	
	Cadmium	Non-Detection	
	Arsenic	Non-Detection	
	Mercury	0.0293	

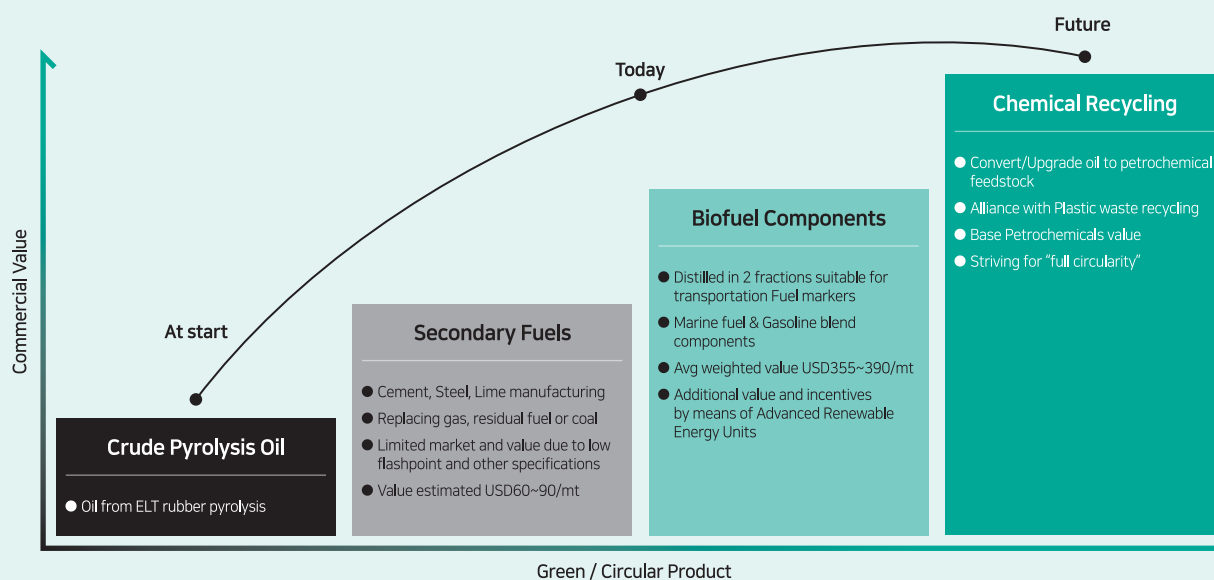
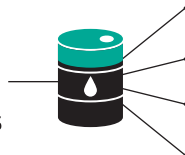
GCC Test Results : Refer to attached test results



GCO

GCO (Green Carbon Oil) is an eco-friendly oil manufactured through thermal decomposition using waste tires as raw materials. This product is characterized by stable supply and quality. The gas generated in the process of decomposing organic compounds in waste tires is condensed to produce Tire Pyrolysis Oil (TPO), which is sold and used for energy production in an industrial environment or is further processed at an oil refinery.

Composition	Ratio(wt%)
Naphtha (IBP~175°C)	27
Middle Distillate (175~343°C)	45
Vacuum Gas Oil (343~524°C)	25
Residue (524°C~)	3



The ecological coexistence activities of bees, the water cycle, and the self-purifying role of plants are the same mindset as LDC's thoughts of the environment.

LDC contributes to the coexistence of nature and mankind with a carbon resource cycle.

This idea of the environment of LDC will be realized through a variety of eco-friendly renewable materials, starting with GCB, the Green Carbon Black.

Make Green From Black.





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