



Kafrit

Masterbatches and Compounds Engineered for the Future of Plastics

ORIGINALLY DELIVERED AT THE **FESTIVAL OF POLYMER INNOVATION 2024**
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Kafrit Group

Masterbatches and Compounds Engineered for the Future of Plastics



Innovation

Outlook

- Kenaf – Renewable functional fibers in thermoplastic applications
- Foaming masterbatches – do more with less
- Conductive compounds – Black is not a must!
- HFFR – environmentally friendly advanced FR solutions

KENAF



Kenaf – Natural Fibers

Kenaf is a natural fiber, obtained from stems of the Hibiscus plant

- Barely requires irrigation
- Standard growing conditions (Desert, etc..)
- Land for cultivation(2-2.5 Ton/dunam)

Kenaf's advantages in plastics

- Reducing carbon footprint
- Reducing density
- Good thermal insulation
- Biodegradable



Kenaf – Why?

Kenaf fibers have economic and environmental benefits

High ability of the plant to use CO₂ from the environment
And by that to Produce O₂

Reducing the cost of plastic applications and
increasing the value of natural fiber.

Reducing carbon footprint significantly

Future regulation



Applications of natural fibers Kenaf

Insulation



Electronics industries



Automotive industry

Textile industry

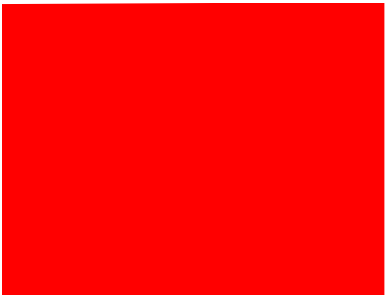
Animal bedding

Food storage containers

Medical applications



Packaging material



Engineered wood



Our Key Formulations

HDPE Compound

55%-75% polymer

15%-30% **Kenaf Fibers**

Melt Flow Rate (190°C\2.16Kg)-5-8 g\10min

PP Compound

62%-77% polymer

15%-30% **Kenaf Fibers**

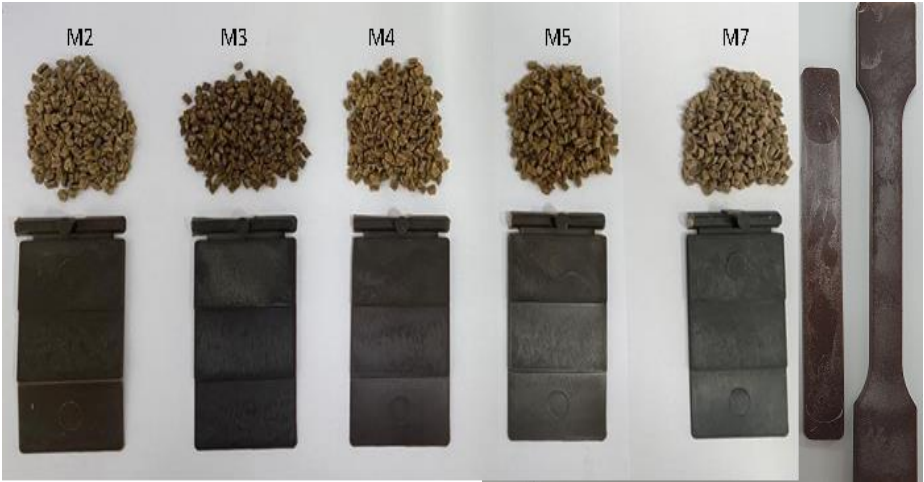
Melt Flow Rate (230°C\2.16Kg)-7-12 g\10min

ABS compound

62%-77% polymer

15%-30% **Kenaf Fibers**

Melt Flow Rate (220°C\10Kg)-11 g\10min



Foaming Masterbatches

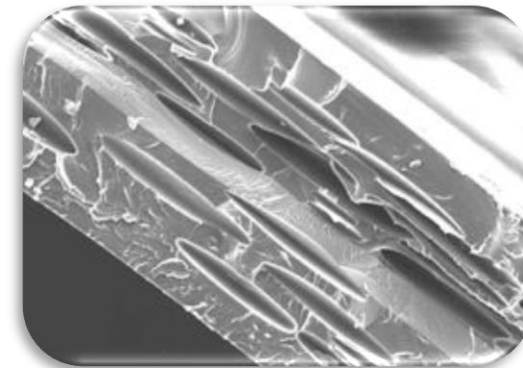
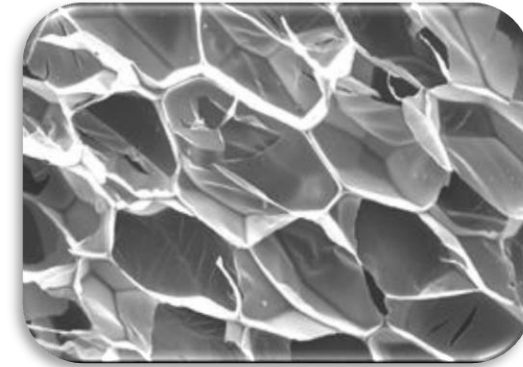


Foaming masterbatches

Foaming (blowing) agent is a substance capable of creating a cellular structure inside the polymer matrix via foaming process.

Two technologies:

- Physical foaming: cellular structure is created via direct gas injection into the extruder utilized gases: N_2 or CO_2
- Chemical foaming: cellular structure is created via a chemical reaction or decomposition that is activated under processing temperature and allows a controlled release of gases like CO_2 and N_2



Foaming advantages

- **Weight reduction** - Can reduce weight by 10-50%
- **Sustainability** - Less polymers consumption
- **Quality improvement**
 - Eliminates surface defects (sink marks)
 - Less warpage
 - Better mold filling
- **Processing improvement:**
 - Faster cooling (endothermic type)
 - Faster cycle times
 - Higher injection speed
 - Energy saving

Insulation Properties

Thermal insulation

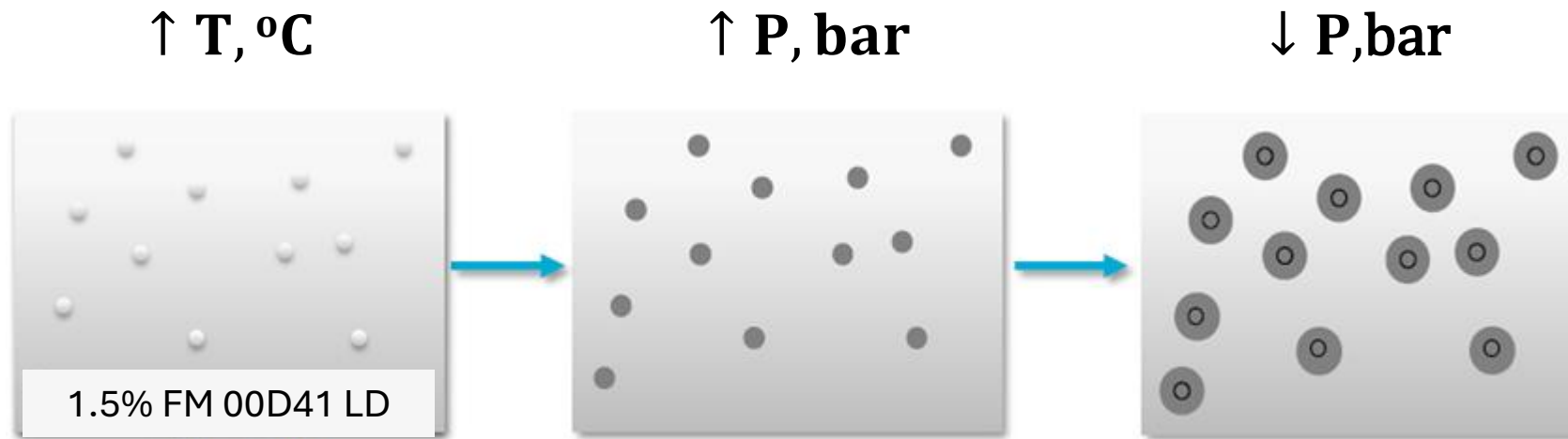
Sound absorption

Surface effects

Better printability

Decorative effects

Processing parameters



- High temperature
- High pressure

Markets and Applications

- Construction
- Packaging
- Automotive
- Extrusion, co-extrusion sheets and pipes
- Injection molding



Case study : Injection Molding

Large size HDPE containers and boxes.



KAFRIT FM 00D41 LD

Endothermic

- Dimensional stability
- Complete mold filling
- Weight reduction ca. 10%

Case study : Injection Molding

PP and HD containers, PP sheets



KAFRIT FM 09570 LD

Endothermic, nucleator

- Dimensional stability
- Complete mold filling
- 10% Weight reduction

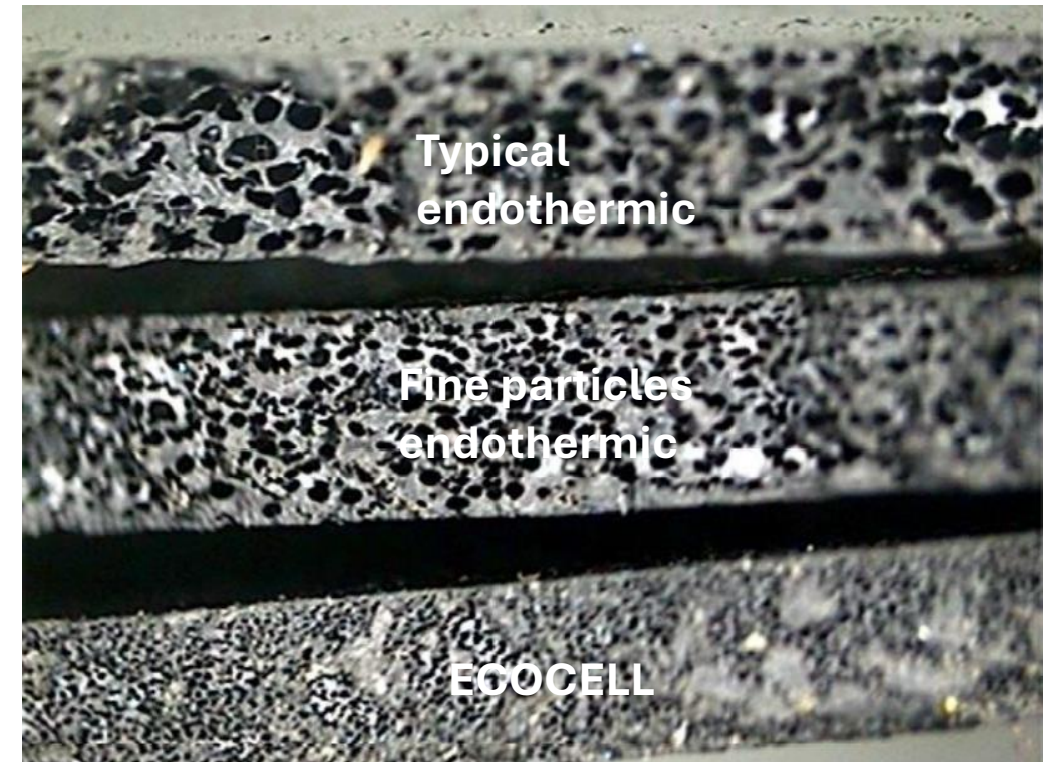
Novel **Ecocell** Technology

- Endothermic
- Evolves CO₂ mostly, **no water release**
- **One activation temperature, one chemical reaction.**
- **Homogeneous and small cells distribution**

Novel **Ecocell** Technology

Benefits:

- Smallest cell size (typical size of 50-125 microns)
- Aesthetics
- Very good mechanical properties
- Least amount of open cells
- Can foam thinner structures.



Ecocell In Thermoforming

Thermoformed mushroom PET trays with ECOCELL GTL



Thermoformed mushroom PET trays with ECOCELL GTL



PLA trays with ECOCELL GTH



PP trays with ECOCELL P



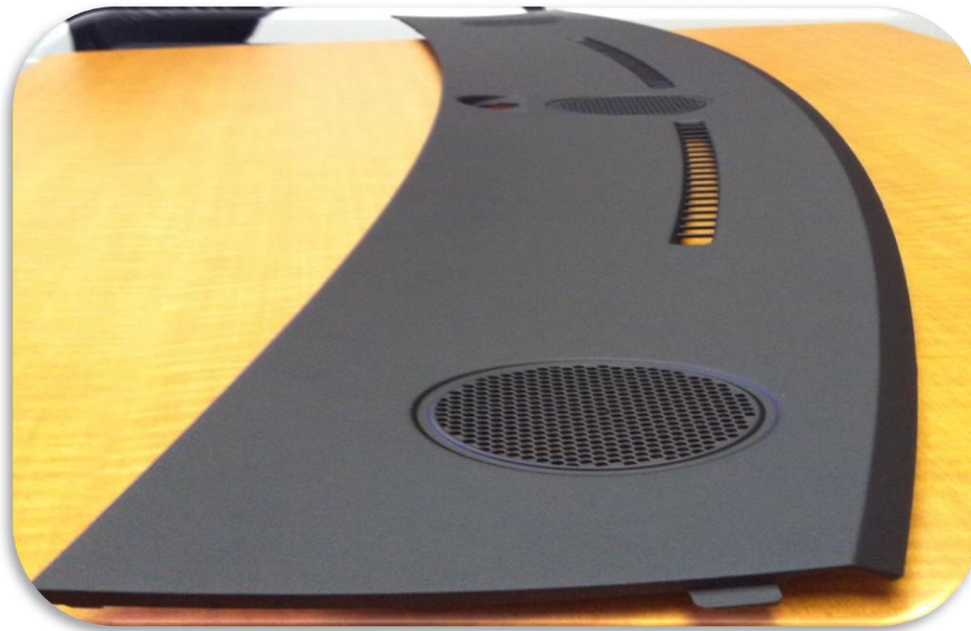
Weight reduction up to 22%

More **Ecocell** Usages Examples

**HDPE blow molded bottles with ECOCELL
P, weight reduction ca. 20%**



**PC/ABS sheet with ECOCELL GTL,
weight reduction ca. 18%**



Regulation Compliance

All raw materials in Ecocell (r) are in compliance with

- * FDA (Food and Drug Administration in the USA) 21 CFR parts 170 - 199. The active ingredients of ECOCELL(r) have GRAS Status (Please contact your representative for complete details, including restrictions of use).

- * Canadian Food Inspection Agency's (CFIA)

- * EU Commission Regulation no. 2023/2006, 10/2011, (EC) No 1333/2008 and (EC) No 1334/2008

- * Prop 65, CONEG, RoHS, and REACH environmental standards.

- * Class I or Class II ozone-depleting chemicals restricted by the 1990 U.S. Clean Air Act Amendments

- * ISO-MAT-0010-13 Chemical Compounds and Substances

Black Conductive Compounds



How it's different from common black conductive market solutions

- **Can replace common antistatic that are not permanent and will migrate . ESD technology is not only for the processing of the product but will keep the electrostatic discharge for the product shelf life**
- **Increase volume Conductivity which enable values of $10^4/10^5 \Omega cm$ where typical Polypropylene $10^{12} \Omega cm$.**
- **Allow level of color ability , in comparison to conventional conductive carbon black.**
- **Decrease electromagnetic interference (EMI). Acting as EMS shielding**

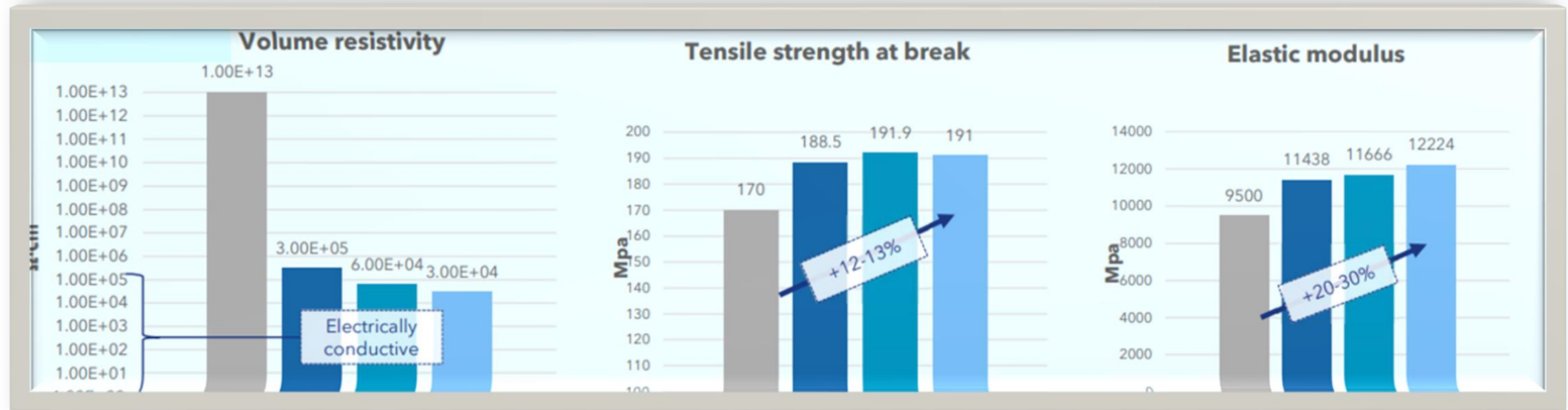
Injected molded boxes



More about this unique technology

- Technology is based on unique modified Carbon Nano Tubes (CNT)
- Works in low dosing (about 7-10% MB)
- Custom made

PA 6 based trails



A photograph of a laptop that is on fire. Bright orange and yellow flames are rising from the screen and the keyboard area. The laptop is open, and the fire is intense, with smoke visible. The background is a solid white color.

New Halogen Free Products

HFFR 00228 PP – For Pipes extrusion and Injection molding

- HFFR & LSZH for the majority of required FR standards
- UL 94 V2, LPS 1207, DIN 4102, etc.
- Good white color tone, allows production of Comibatch's
- For solid PP parts
- 2.5% usage comply with the common EN 50642 (under 1000 halogen PPM)



HFFR 00242A PP – for filaments , fibers , films

- HFFR MB suitable for PP apps
- Main recommended apps are filament Nonwoven and woven products
- UL 94 V2, LPS 1207, DIN 4102, EN 13501, NFPA 701 , etc.
- Has moderate UV performance
- For thin PP parts
- Minimal impact on optical features
- Usages Percentage : 3-7

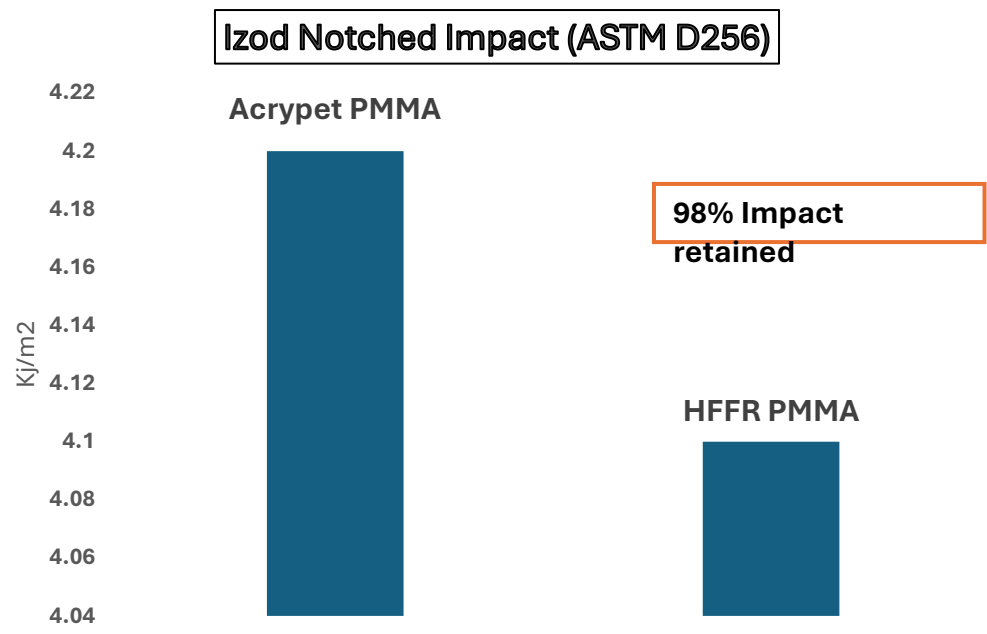


HFFR 00987 PMMA – ZHFR semi compound

- Excellent transparency
- UL 94 V2 performance at 1.6 & 3.2 mm
- Good impact (ASTM D256)
- To combine with 40-60% Virgin PMMA



HFFR 00987 PMMA - ZHFR semi compound



Contact us

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Working together for the future of plastics.



Q&A

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