

Controlled-life Plastic Technology

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Ghanem Development & Trading (GDT)
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*Some things,
You want to keep forever.
But definitely not the
plastic!*



www.d2w.net



**Symphony
environmental**
A British Public Company

Copyright Ghanem Development & Trading

About GDT

- **Established in 1996**
- **Specialized in plastic raw material**
- **Exclusive Distributor of d2w in Lebanon**
- **Launched d2w in May 2009**



Ghanem Development & Trading Co



Symphony Environmental Technologies Plc

- The only quoted company in Controlled-life Plastic Technology
- Shares traded on 'AIM' market of the London Stock Exchange "SYM" also on the Plus Market in London and in New York under Bank of NY ADR program "SETPY"
- Headquartered in London
- Accredited with ISO 14001:2004 and 9001:2008
- Global Brands are d₂w and d₂p and d₂Detector
- Active in 96 countries worldwide
- Chief Scientist, Professor Gerald Scott DSc, FRSC, C.CHEM, FIMMM
- Symphony provides a high quality global service through its multi-lingual scientific, technical, and customer service teams
- Our Chairman is a Member of the European Parliament.



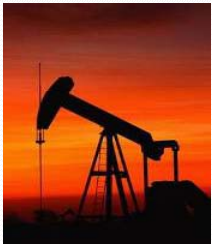
Let's talk about plastic

- You can use it?
- You can re-use it?
- You can Abuse it!

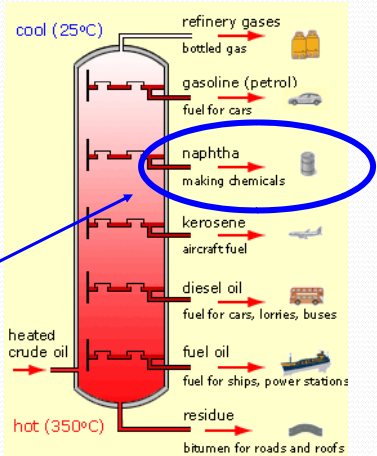





Using Available Resources

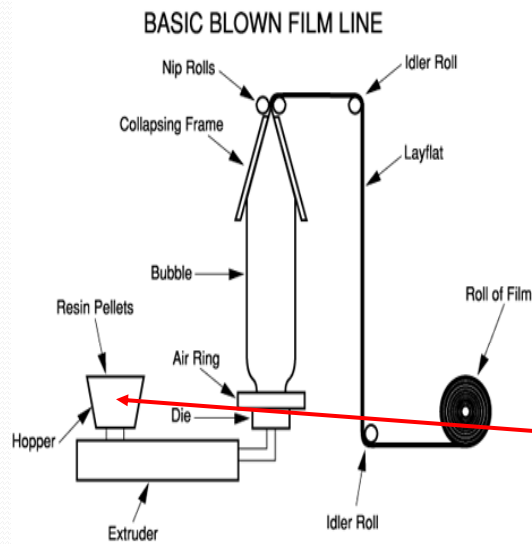


- Plastic is made from a by-product of oil.
- Less than **3%** of oil is made into plastic.
- It makes good environmental sense to use it for plastic production, otherwise it could be flared off.





Naphta → *Raw Material* → *Bag*



Environmental Benefits of Plastic

	Energy
• A million square meters of cellophane	180 tonnes
• A million square meters of PP Film	76 tonnes
• A million glass bottles	230 tonnes
• A million PET bottles	66 tonnes
• 60 miles of cast iron Pipe	2000 tonnes
• 60 miles of Plastic Pipe	270 tonnes



Plastic is critical to everyday life because it is:

- Lightweight
- Flexible
- Strong/Durable
- Heat sealable
- Impervious to moisture
- Printable
- Recyclable
- Reusable



***FACT**

**EVERY YEAR, APPROXIMATELY
200 MILLION TONS OF PLASTIC IS PRODUCED
GLOBALLY
PLASTICS CAN TAKE MANY DECADES TO BREAK
DOWN**

University of Cambridge

**Globally
only 3%
is recycled**





Danger of Discarded Plastic!



Plastic Vortex in North Pacific

Researchers estimate the vortex is **twice** the size of the US state of Texas and **four times** the size of Japan. The patch includes plastics, chemical sludge and other debris that has been trapped by the currents.

One of the coordinators of Project Kaisei, Doug Woodring said: "When a [sperm] whale in California washed up six months ago, they opened its stomach and it had **400 kilos of plastic** and netting inside,"

Charles Moore, an ocean researcher credited with discovering the Pacific garbage patch in 1997 said: "**Humanity's plastic footprint is probably more dangerous than its carbon footprint**"

The Plastic Disposal Issue

Current preferred options for disposal of plastic waste:

- Traditional landfill
- Incineration
- Recycling
- Composting



BUT ONLY IF IT
CAN BE COLLECTED



NOT preferred options:

- Litter



TO BE AVOIDED



So what do we do about it?



Symphony has the solution!



Added Value Solution

The Insurance Policy

d2w® Eco-compatible Plastic Technology



Complete degradation 2 – 5 years after the end of the products' predetermined useful life span*

If littered, degradation can take place within a few short months when exposed to hot climatic conditions

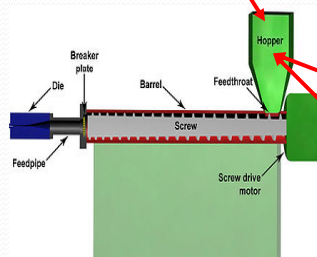
* Depends on product type and exposure conditions



d2w® Eco-compatible additive system



- The d2w oxo-biodegradable technology is a masterbatch system that is added with the basic polymer resin during the manufacturing process.
- No changes to extrusion process required.
- No impact on line speeds or plant maintenance.
- No requirement for special training for labour.
- It is just a process of “adding degradability” to conventional plastics



Raw Material + Masterbatch =

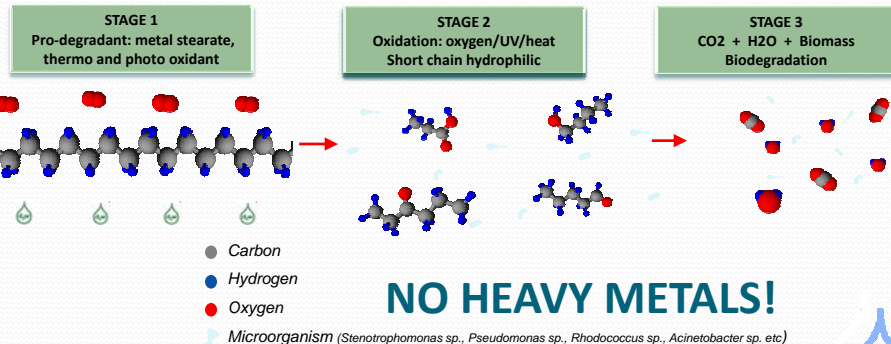


The Process

The catalytic effect of the d₂w additive breaks these chains and generates free radicals.

The free radicals combined with the available oxygen atoms will create hydro peroxides.

The resulting short-chain hydro peroxides are available for consumption by micro-organisms. After the degradation process the harmless residues are CO₂, H₂O and Biomass.



NO HEAVY METALS!



Eco-compatible Plastic

The Composition

S1

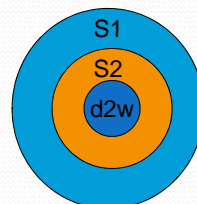
S2



Prodegradant trigger

1st stabiliser

2nd stabiliser



Prodegradant trigger - The catalytic action creating the free radicals is arrested and controlled by two stabilizer packages.

The first stabilizer protects the prodegradant trigger transition during the manufacturing process.

The second stabilizer ensures that the finished product fulfills its functionality and sustains an adequate shelf life.



The Degradation Process



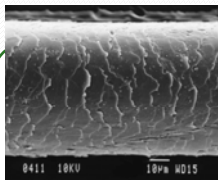
Embrittlement of plastic bag



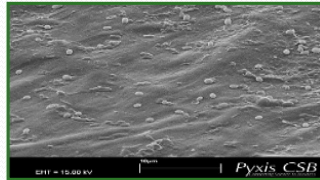
Continuing fragmentation



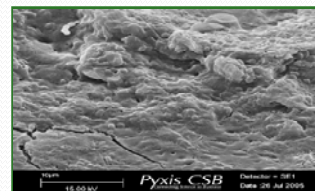
The Biodegradation Process Scanning Electron Microscope (SEM)



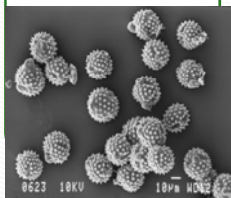
Human Hair



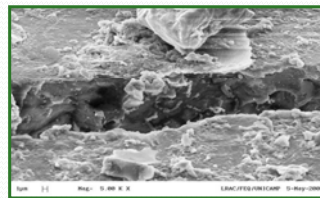
Un-oxidised film. Film intact and limited microbial activity on surface due to the surface being hydrophobic



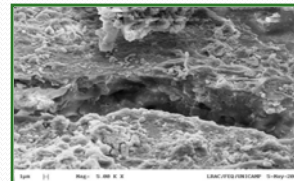
Cracks and fissures on surface of oxidised, hydrophilic film



Pollen



Furrows and ridges eroded into the surface of the film by microbial activity



Microbial colonisation on surface of oxidised, hydrophilic film



Responsible use of plastic

The Three R's



- **REDUCE:** **d₂w**® will reduce the burden of persistent plastic waste in the environment
- **REUSE:** **d₂w**® products can continue to be reused for a finite amount of time
- **RECYCLE:** **d₂w**® based products can be recycled and made from recycled plastic polymers



Is this how you want your brand to be thought of?

The Brand Value



Protect your brand investment

- Plastic packaging helps to keep your product fresh and/or intact until used
- The marketing message helps to sell the product and create the value
- After the product is used the marketing message needs to vanish otherwise it becomes a liability rather than an investment asset
- The counterfeit position - After the product is used, the label and also the container needs to self-destruct so as to avoid counterfeit products being produced using your packaging



- a brand you can trust!

Certifications

- **Food contact Approved.** All grades of d₂w are compliant with requirements of:
 - The European Union 2002/72/EEC regulations for Direct Food-contact and all amendments.
 - The FDA American requirements for direct food-contact materials.
 - CFIA Canadian requirements for direct food-contact materials
 - Brazilian ANVISA requirements for Direct Food-Contact
- **Degradable** - tested according to ASTM standard D6954 and ISO 4892/2, ISO 4892/3
- **Biodegradable** - tested by independent laboratories to ISO 17556 and 14855 Applus (Spain), PYXIS (UK), University of Pisa (Italy), RAPRA (UK) and UFSCar / UNESP (Brasil)
- **Non-Ecotoxic** in compost tested according to OECD 208 and EN13432 - tested by independent laboratories Applus and OWS (Belgium)
- **Absence of restricted chemicals** according to REACH directive
- **Certified** by the Oxo-biodegradable Plastic Association ("OPA") – www.biodeg.org



Applications

- Bread Bags
- Carrier / Supermarket
- Retail Bags
- Trash
- Laundry
- Magazine / Newspaper
- Shrink-wrap / pallet-wrap
- Bottles, Cups, Cutlery



Some of d2w Users in Lebanon



Some major users of d₂w



Certification Program



- All manufacturers making products using d2w additive are issued with a Certificate for display at their premises and the unique number provides Q/C traceability
- All users are entitled to a certificate as part of the PR marketing program.



Quality Assurance & Authenticity

DOES YOUR PLASTIC PRODUCT REALLY
HAVE d₂ADDITIVES INSIDE OR SOMETHING ELSE?
YOU NEVER KNOW...

BUT NOW YOU CAN
IN ONLY 60 SECONDS!



d2Detector – Testing

All in less than 60 seconds!



- A hand held unit to confirm the correct level of d2additives
- Put nose of sensor flush against samples for testing.
- Pull trigger
- Screen will display the result giving the exact reading of d2w parts per million (ppm)
- Green light will indicate pass, Red light will indicate failure of test.





Ministry of Environment in Lebanon certifies d2w!



The Innovation the World needs



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