

ZERMATT SUMMIT 2019

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Presenter:

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TOPICS

- **TOXIC-FREE** & ECO-FRIENDLY, IN NATURE BIODEGRADABLE CHEMICAL ADDITIVES
- **RECYCLING** OF WASTE MATERIALS FROM THE PLANT KINGDOM
- **CO₂ REDUCTION**
- **IMPREGNATION** TO WITHSTAND FIRE ATTACKS & MOULD / FUNGUS / ROT ATTACKS



BIOMIMETIC TECHNOLOGY LTD

- R&D Chemical Laboratory company
- Established 27 March 2009 in the UK
- Brand name **BIO-ECO** (aimed for natural fibre materials)
- Brand name **MHE** (aimed for synthetic materials)
- Speciality => **cost-effective**, toxic-free & eco-friendly, in nature biodegradable chemical additives



MISSION

Biomimetic's corporate mission is to provide cost-effective chemical high-tech product solutions, developed on sustainability innovation technology.



TARGET

- **Biomimetic's** target is trying to reduce the use of harmful chemical additives globally.
E.g. all toxic FR – fire/flame retardant products.
- **The GLOBAL FR Market represent \$7 Billion USD per annum, with an annual market growth of 6.9% .**



INNOVATION

- The innovation is a "**Gamechanger**", regarding chemical fire/flame retardant additives, in respect of being absolute toxic-free and eco-friendly, in nature biodegradable, aimed for polymer, plastic and fibre materials, both synthetic as well as natural.
- By **recycling** waste materials of the plant kingdom, to get required cellulose to become modified, especially to meet different host material applications, **the CO₂ impact on the environment reduces**.
- The innovation has ability to reduce the number of frequently used harmful chemical additives, **in mission to achieve a toxic-free environment for humans**, especially for future generations.



PRODUCT APPLICATIONS

- A number of product applications are available
- Product applications requested by material manufacturing industries concern to be,
 - cost-effective
 - toxic-free
 - eco-friendly
 - in nature biodegradable
 - reducing CO₂ impact on the environment



BIO-ECO SPECIAL MODIFIED CELLULOSE



BIO-ECO CELLULOSE APPLICATIONS

- **food bio-packages** replacing plastic materials,
e.g. food packages aimed for microwave oven 900W / 2 minutes or convection oven +200°C / 20 minutes.
- **paper wrap** impregnation
- **cotton fabrics FR impregnation**
- **wood timber** fire retardant (FR) impregnation
- **wood planks** impregnation (FR, mould, fungus, rot)



BIO-ECO CELLULOSE APPLICATIONS

- **detergent products** (heavy dirt /garage floor etc.)
- **textile cleaning** of heavy dirt (motor oil etc.)
- **car wash products** (motor, wheels, windshields, body) & **surface protection top coating layer**
- **automotive industries** (FR treatment of jute & hemp fibres, aimed to replace carbon fibre)
- improved **skin wound healing** (to be further investigated)



Food bio-packages of **Cassava** treated to withstand microwave oven 900W/2min resp. convection oven +200°C/20 min, incl. storage in freezer or refrigerator



- 1.) Cellulosa treatment of cotton fabrics;
- 2.) Motor oil & lubricant contaminated cotton fabrics
- 3.) Dipped into cellulose liquid to be cleaned
- 4.) Cleaned from contaminated motor oil & lubricant



Impregnation of wood to withstand open flames



Impregnation of wooden planks to withstand mould, fungus and rot attacks



Car Wash + Surface Protection Top Coating Layer products



BIO-ECO treated thin paper



For further investigation:

Wound healing in less than 5 minutes treatment with **BIO-ECO** cellulose spray-on top coating layer.

Scientific research to be started. Clinical studies required.



MHE APPLICATIONS

ABSOLUTE TOXIC-FREE & ECO-FRIENDLY IN NATURE BIODEGRADABLE

- **Active fire fighter** – wild forest fires / bush fires
- **Prophylactic fire fighter** to protect properties in the neighbourhood of wild fire



PROPHYLACTIC FIRE FIGHTER

- Every year farms, barns and stable are attacked by fire. Electrical breakdown due to lightning or dust explosions, are the most common reason for fire to occur.
- Animals in barns and stable are caught by the fire. Mostly, the lost of money is handled. But, the lost of the animals is much harder to come over.
- By spraying the buildings with **BIO-ECO**, in-& outside to protect the properties from any wild fire attack in the neighbourhood, you might save your property for a small investment of money.

MHE[®] APPLICATIONS

- **Synthetic material FR impregnation treatment**
 - PUR (polyurethane resins), PU-foam (TDI¹/MDI²)
 - Soft PVC (polyvinyl chloride), PVC emulsion
 - Polyester
 - Polyamide
 - Viscose
 - EPDM³ rubber

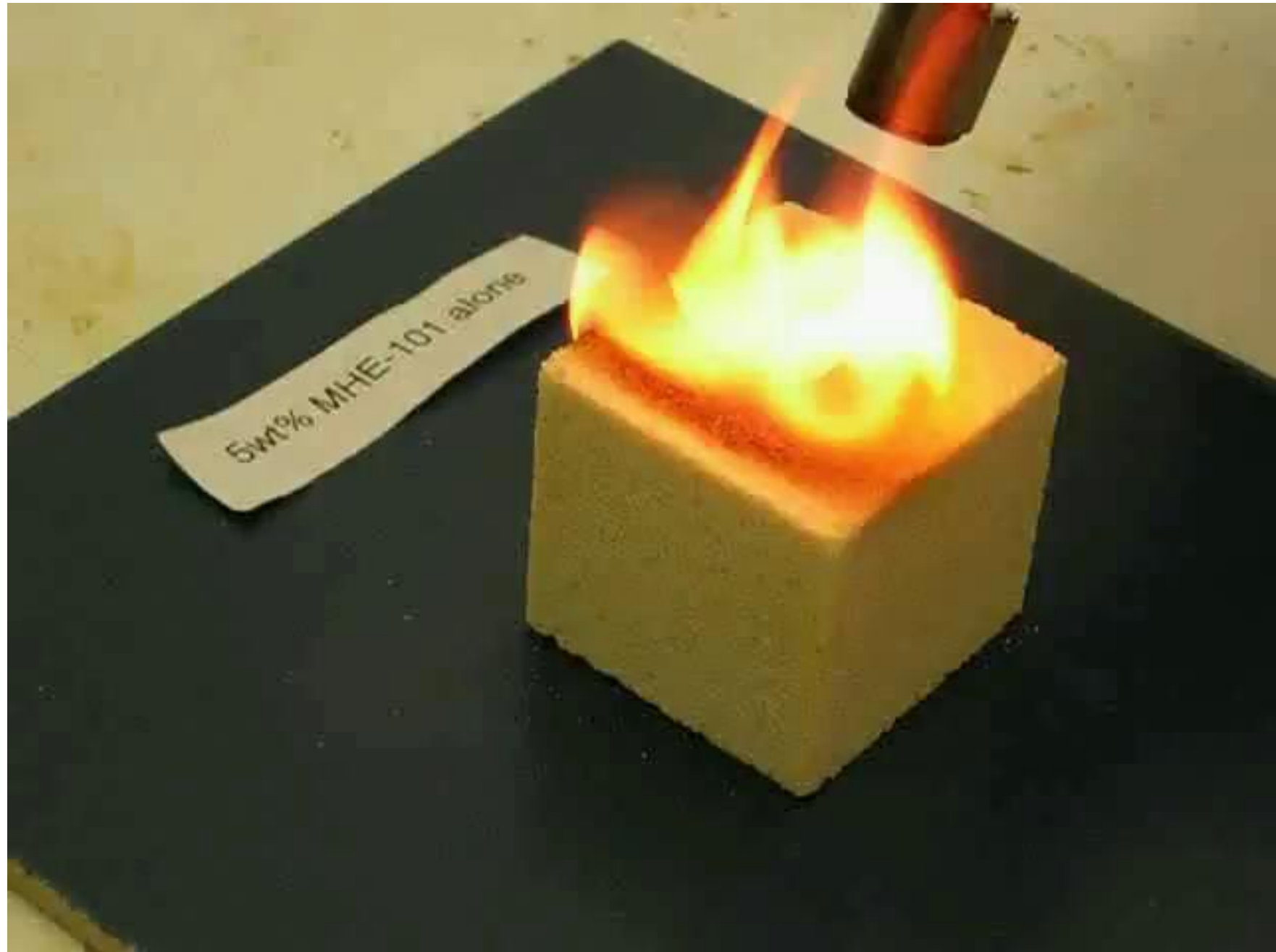
1) (TDI = toluene di-isocyanate)

2) (MDI = methylene diphenyl di-isocyanate)

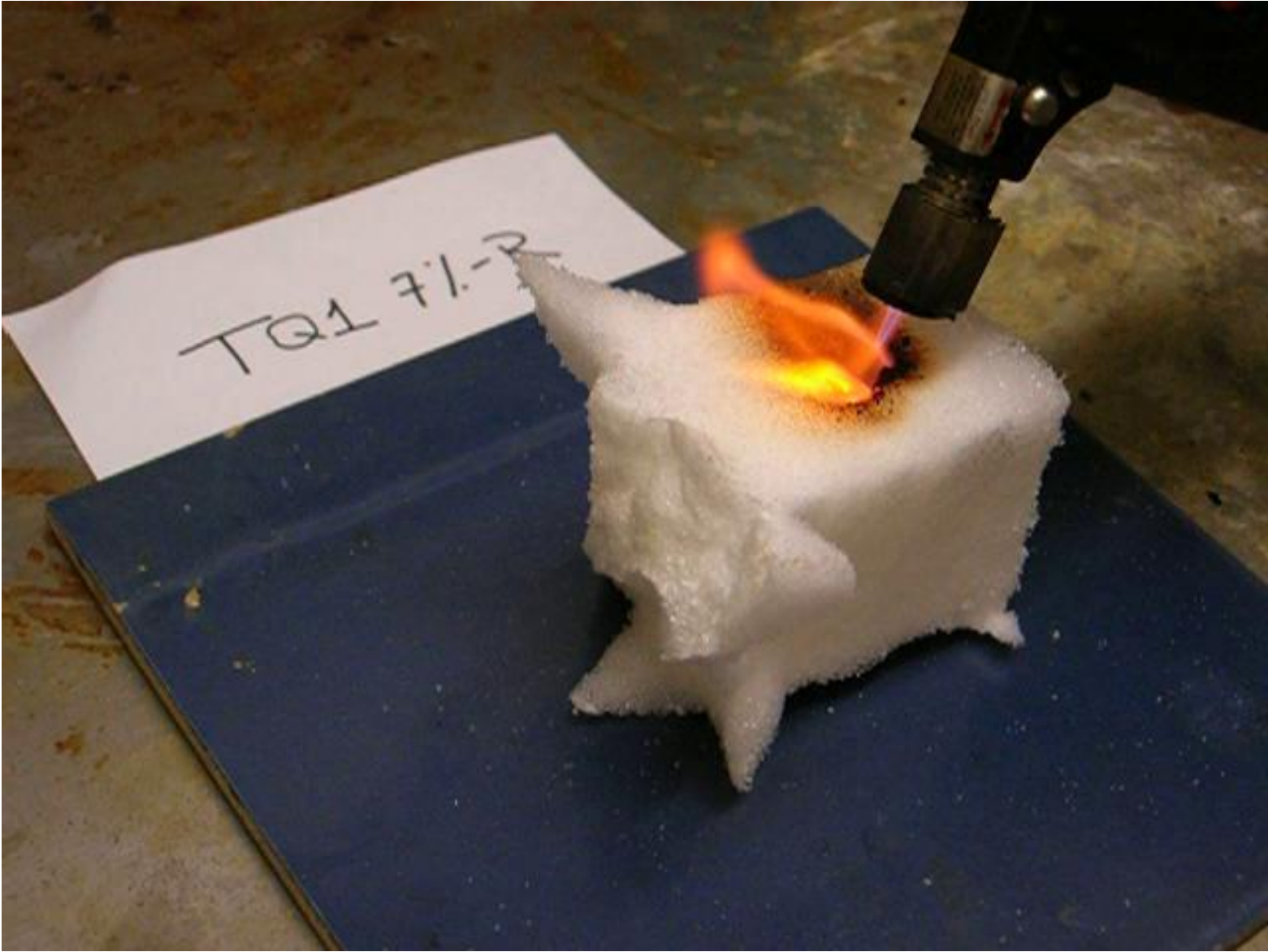
3) (EPDM = ethylene-propylene-diene co-monomer)



PU-foam MDI FR treated insulation aimed to withstand open flames



PU-foam TDI FR treated insulation aimed to withstand open flames



PVC emulsion FR treated to withstand open flames



MHE® FR treated EPDM rubber to withstand open flames



HOW SAFE IS YOUR HOME ?



CAUTIONS ! - TO CONSIDER.....

- Fire and burns are the 3rd leading cause of accidental death in USA, with more than 3,000 lives per year.
- In the Western Industrialized world the figures are estimated to be about 10 times that.
- 14% of infant deaths in the Western Industrialized world, are due to fire.
- The scale of accidents and deaths caused by fire in developing countries may be even greater.



CAUTIONS ! - TO CONSIDER.....

- The commonly-used halogen chemicals, like bromine and chlorine compounds in flame-retardants, are really toxic and cause substantial harm to humans and environment. It is the same with the frequently used organic phosphorous esters.
- Recently, even the frequently used boron compounds were put on the UN (United Nation) abandon list of chemicals to get rid off.



CAUTIONS ! - TO CONSIDER...

- Traces of toxic flame retardants can be found in human breast milk, fish and whales. Research shows dramatically increasing concentrations of bromine compounds through bio accumulation causing permanent damage to learning and movement abilities in children.
- Scientists have proved that borates have a direct negative impact on the human fertility.
- According to current growth rates, concentrations of toxic flame retardants in humans will double every 2-5 years. This means that concentrations found in human tissues will increase 100-fold or more by year 2030!



CONCLUSION

- The gap between a great idea and manufacturing and launching it, to become a commercial product, is a well-known challenge across industries. The main problem to reach a market breakthrough for new innovative, toxic-free and eco- friendly products, often fails due to none existing legislation or weak requirements for toxic-free products. But also due to a strong lobbyism concerning financial interest for already heavy marketed products, mostly toxic and frequently used.

SUMMARY

- The huge challenge for the environment and human health requires;
- - **reduction of CO₂ impact**
- - **reduction of synthetic materials - (polymer & plastic)**
- - **increased implementation of innovative, eco-friendly, toxic-free products**
- - **increased recycling of waste materials**
- *All in mission to achieve a toxic free environment for humans – today and for future generations.*



- **THANK YOU VERY MUCH FOR YOUR ATTENTION !**
- Questions will be answered during the cocktail hour.

