

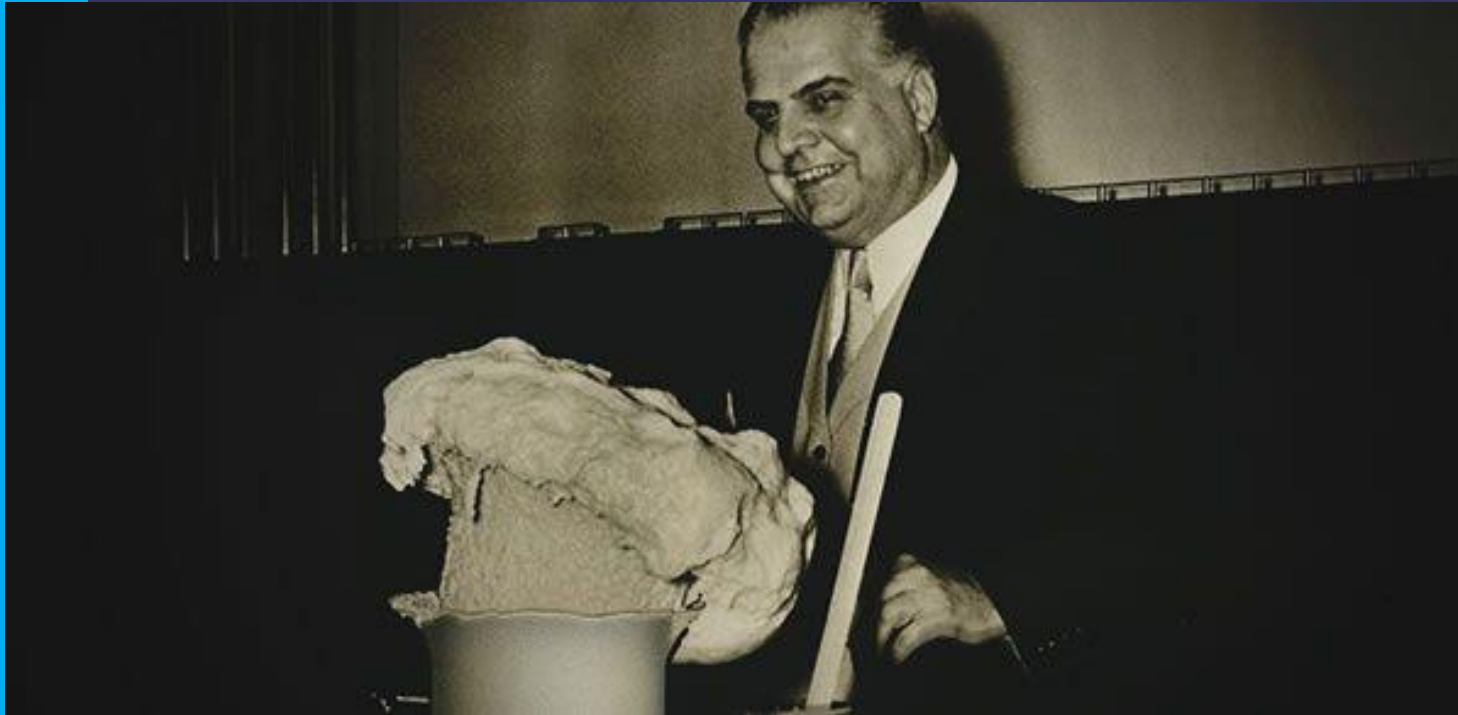
POLYURETHANE – BUILDING A SUSTAINABLE FUTURE IN EVERY ASPECT OF LIFE

Technical polyurethanes congress
- Polyurethane in Every Aspect of Life

Christopher Metz
President, ISOPA
6-7 November 2024

Isopa

THE START OF INNOVATION THAT WOULD CHANGE THE WORLD



GLOBAL MEGATRENDS REQUIRE A SUSTAINABLE STRATEGY



Light-weight, durable, and a highly efficient insulator..

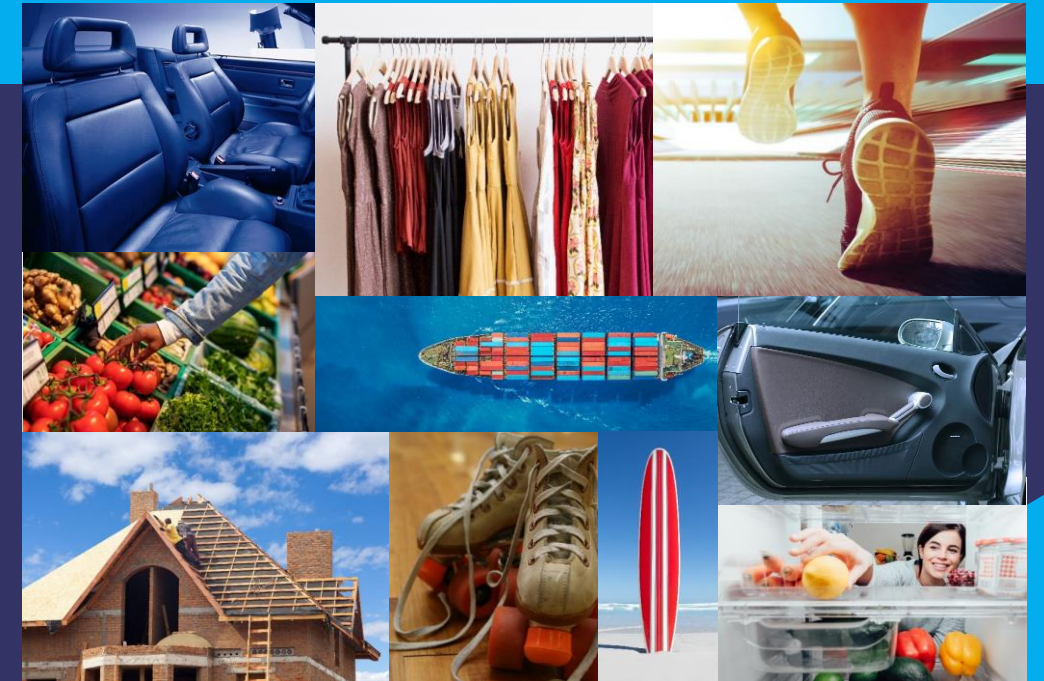
Polyurethane is an ideal material to facilitate the sustainable transition

BUILDING A SUSTAINABLE FUTURE IN EVERY ASPECT OF LIFE

Building a sustainable future



...In every aspect of life





POLYURETHANE THROUGH TIME

How did we get here?

HOW POLYURETHANE OVERCOMES THE CHALLENGES OF THE TIME

1940s flexible foams, rigid foams, and adhesives

1940s

1948 First beer barrel insulated with polyurethane

1953 PU-based shoe soles

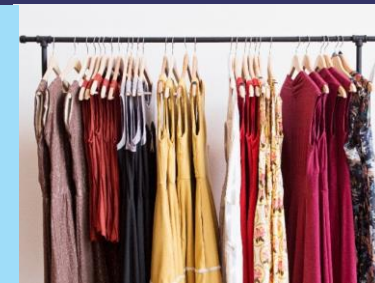


1953 PU in cushions



1950s

1958 spandex fiber in clothing



1960 Steel sandwich building panels
1964 Rigid board polyurethane



1967 K67 concept car with polyurethane interiors



1961 PU linings in space suits



1960s

1969 Car seats, headrests, padding, and bumpers



1979 Spray building insulation



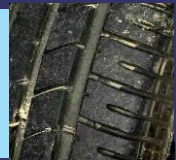
1990 First passive house with PU window frames



1990 PU football



2001 Car tires with PU



2011 PU in e-cars



1970s

1980s

1990s

2000s

1970 Imitation wood products



1985 Energy-absorbing foam in cars



2004 Syncardia total artificial heart



2014 First solar-powered plane with PU in frame





SOCIO-ECONOMIC IMPORTANCE

How polyurethane shapes the lives of millions in Europe

SOCIO-ECONOMIC TRENDS IN EUROPE

Approx. total PU market:
€ 233 BN



PU value chain



SOCIO-ECONOMIC TRENDS IN TÜRKIYE

Approx. total PU market:
€ 10 BN



PU value chain





SUSTAINABLE FUTURE THROUGH POLYURETHANE

WHAT IS SUSTAINABILITY ABOUT?



See sustainability as a puzzle with countless different pieces.

Let's explore two main avenues:

1. Sustainable solutions with polyurethanes.
2. Making polyurethanes fully circular.

SUSTAINABILITY THROUGH POLYURETHANE

“

A rigid piece of polyurethane foam insulation saves over its lifecycle about 80 times the amount of energy that was needed for its production

”

THE COLD FOOD CHAIN



From insulating animal sheds, refrigerated containers, local storage in supermarkets, to domestic refrigerators and freezers, polyurethane insulating foam plays a vital role.

ENERGY SAVING IN BUILDINGS



In the EU, over 40% of fossil fuel-based energy is associated with the heating and cooling of buildings. Using polyurethane insulation will go a long way in reducing its carbon emissions.

POLYURETHANE ON THE MOVE



As a light, durable, and safe material, polyurethane ensures energy efficiency in vehicles by reducing weight, whilst also providing comfortability and longevity.

ALTERNATIVE ENERGY SOURCES



Polyurethane's unique properties make it a useful material in various high-tech applications in the areas of wind and solar power, as well as in energy transportation.

THE POTENTIAL OF POLYURETHANE

What is the most interesting aspect of polyurethane? ...it is **potential**



A SUSTAINABLE POLYURETHANE INDUSTRY

Our industry is committed to reduce its carbon footprint and becoming climate neutral.

- 1. Mass Balance Approach**
- 2. Chemical Recycling**



MASS BALANCE APPROACH

What? Transparent and auditable method to trace a defined material characteristic along the value-chain.

Why? Allows for leveraging alternative feedstocks in already existing infrastructure, together with the fossil-sourced feedstock.

CHEMICAL RECYCLING

1. Break polymers up into monomers



2. Resulting feedstocks form valuable chemical building blocks to produce new products

3. Products derived from chemical recycling have properties and characteristics similar to virgin products

PROJECTS AT PILOT/INDUSTRIAL SCALE

DOW launches mattress recycling programme RENUVA™

Construction of Europe's first chemical recycling plant for post-consumer PU foam in Semoy, France

TripleHelix works to provide end-of-life solutions including chemical recycling of flexible PU foam



Repsol announces plans to build Spain's first chemical recycling plant for PU foam

Retour Matras announces plan to expand recycling capabilities with chemical recycling

Covestro develops innovative process for the chemolysis of flexible PU foam from post-consumer mattresses

BASF develops chemical recycling process for post-consumer mattresses, currently running pilot tests





KEY TAKEAWAYS

Polyurethane...
invented to be re-invented

But **we** need to do it!

THANK YOU

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