Akin Solutions

VISUALIZING MOLECULAR DIVERSITY

MARCH 2025

The only molecular imaging provider for the tire industry

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About Akin Solutions

To decrease global tire pollution and increase sustainability within tire manufacturing Akin Solutions B.V. provides tire manufacturers with services and products focused on rubber polymers, fillers, and antiozonants. Our molecular image services and rubber degrading enzymes provide novel information regarding the distribution of tire ingredients, advancing tire development.

Our mission is to decrease tire pollution globally by providing tire manufacturers with the necessary tools to create longer-lasting, durable tires, include more sustainable (including recycled) ingredients, reduce the harmful impact of toxic ingredients and microplastics on the environment, and make tire manufacturing increasingly circular.

It is our vision to be at the forefront of tackling some of the largest sources of environmental pollution and strain put on natural resources globally by becoming a key player among the various stakeholders within the tire manufacturing industry and providing them with innovative technology and insights needed to accelerate their sustainability efforts.

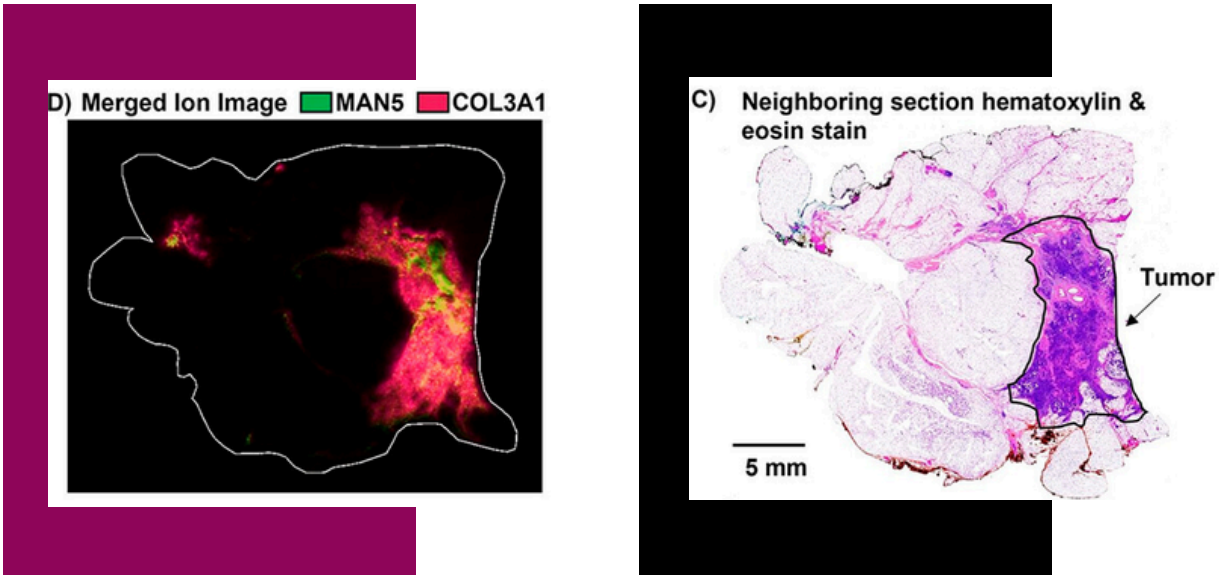
Power of Molecular Imaging

Used in the life sciences industry for toxicity testing and biomarker discovery

Our innovative approach integrates MSI, enzymology, and materials analysis to address critical gaps in tire development processes. At its core, our analytical platform utilizes advanced MSI technology, specifically Matrix-assisted laser desorption ionization mass spectrometry imaging (MALDI-MSI). This cutting-edge approach enables:

1. Precise molecular-level insights into tire compositions
2. Simultaneous multiplex imaging of thousands of molecules
3. Comprehensive analysis of metabolites, amino acids, sugars, lipids, peptides, proteins, and polymers

While MALDI-MSI has found success in pharmaceutical applications, Akin Solutions is pioneering its use in the tire industry. Current analytical methods in tire manufacturing fall short of providing the molecular-level insights required for next-generation tire development. Using our molecular imaging technology we aim to fill this crucial gap, offering analytical capabilities for each selected application.



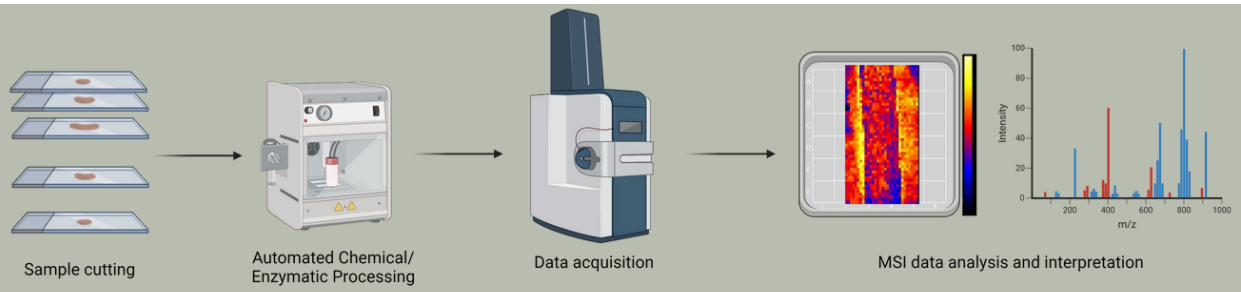
Moore J. L., Charkoftaki G., 2023, A Guide to MALDI Imaging Mass Spectrometry for Tissues, J. of Prot. Res., 22 (11), 3401-3417

BioRecycle Process

See Beyond Traditional Testing Methods

To decrease tire wear we utilize mass spectrometry imaging technology, in combination with novel analytical enzymes, to provide molecular images of the composition of the tire, within a sectioned tire compound.

Unlike more conventional methods, molecular imaging provides you the means to analyze major organic tire ingredients, such as polymers, organic fillers, and other additives, while preserving the spatial information of these ingredients within the tire. Molecular imaging of tire compounds enables you to generate data on each ingredient of interest presented within a specific region of the tire.



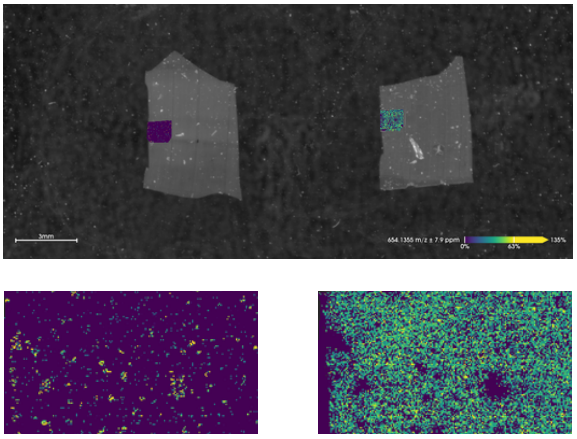
We utilize **mass spectrometry imaging** techniques and tailored sample processing to reveal what empirical testing cannot - the **exact spatial distribution and concentration of key compounds** within tire material sections.

Use cases

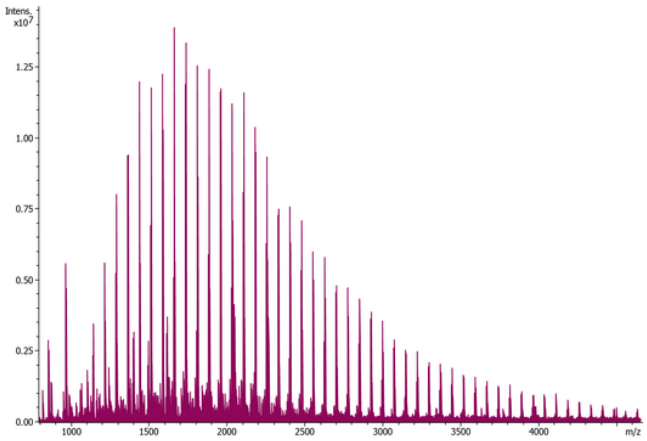
Polymer Imaging

Full polymer fingerprint of tire material, including spatial location of ingredients.

Imaging polymer distribution patterns



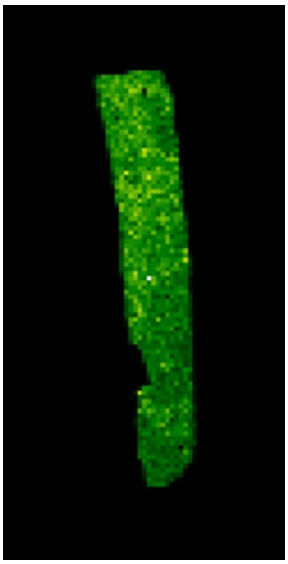
Mass spectrum: Polymer repeating unit distribution



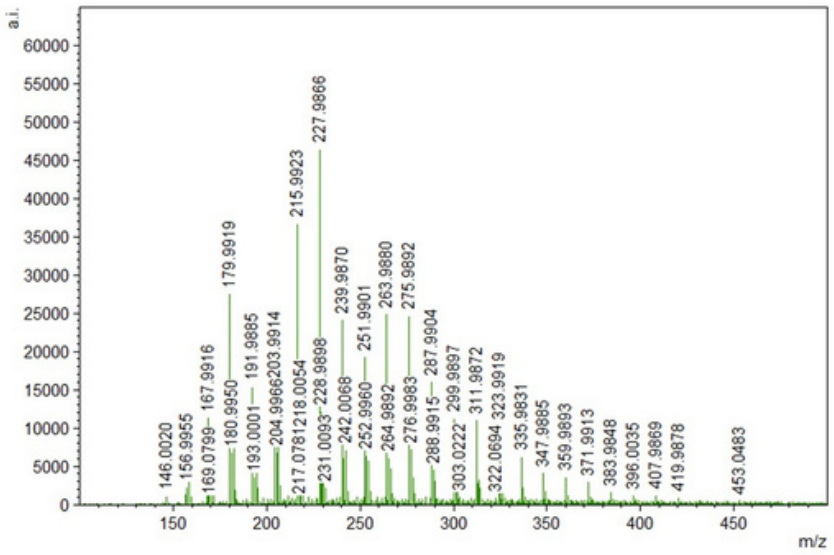
Carbon Black Imaging

Assessment of material changes when replacing virgin carbon black with recovered.

Distribution carbon black unti within tire section



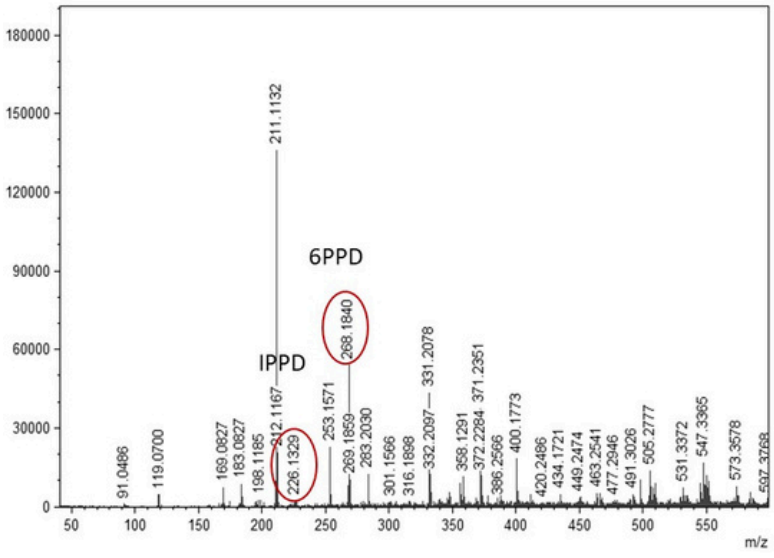
Mass spectrum: Carbon black lattice distribution



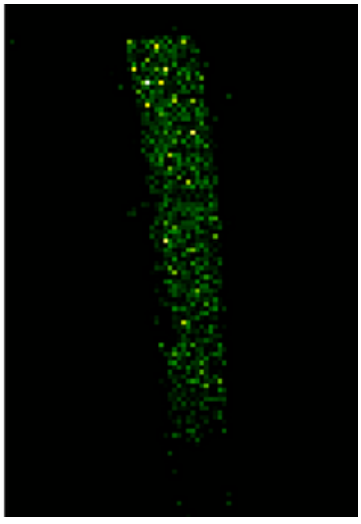
Antiozonant Imaging

Spatial analysis of antiozonants in tire material to assess homogeneity and leeching.

Mass spectrum: PPD signal



Distribution of 6PPD within tire section



Cost of Service

Our costs are broken down into the base cost which includes labour, sample analysis, basic material costs, data analysis, and reporting involved. There are additional costs for prolonged data storage, and additional material costs, such as our proprietary rubber-breakdown enzymes.

Project duration and costs are dependent on complexity typically lasting between 3-9 months. Our pricing guidelines are provided below. If you'd like to discuss a pilot project bundle cost, contact us for a consultation.

EUR € (VAT excl.)	Antiozonant	Filler	Rubber Polymer
Basic Package	30.000	50.000	70.000
Additional material cost	0	0	1500
Data storage cost	30/month	50/month	75/month

Our team

With deep expertise in molecular imaging and enzymatic processes, Akin Solutions harnesses scientific innovation and expertise to serve the tire manufacturing industry. Our growing team specializes in novel molecular imaging processes and developing analytical enzyme solutions tailored specifically for tire applications. Through our strategic partnerships with the Elastomer Competence Center at the University of Twente, we bridge cutting-edge academic research with practical industrial applications, transforming complex data into valuable intelligence that drives innovation and efficiency in your manufacturing operations.

Organization and Management

Dr. Ieva Palubeckaitė
FOUNDER / CEO

Halithan Cetin
COO

Ruben Habraken
BUSINESS DEVELOPER

Dr. Eric Rutten
SCIENTIFIC EXPERT

Partnerships

Prof. Dr. Anke Blume
EXPERT ELASTOMER TECH

ELASTOMER COMPETENCE CENTRE

Dr. Javier Araujo Morera
EXPERT ELASTOMER TECH

ELASTOMER COMPETENCE CENTRE

For inquiries, contact us.

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