



LIFE20 GIE FR 282 - RE-PLAN CITY LIFE

RElevant Audience Plan Leading to Awareness Network for Circular Economy Use of Recycled TYre materials in city LIFE

RE-PLAN project meeting in Turin: Sharing the results of workshops on RTMs in Building construction and Rubberized asphalt

It's time to share the results of the meeting in Turin, Italy, on September 28th and 29th, 2023. Thirty-four persons from 8 countries attended the Turin Project meeting and the two workshops.

The first day started with the RE-PLAN CITY official project meeting and the Workshop on Rubberised asphalt, which concluded with a fruitful round-table discussion. Participants, including manufacturers and contractors, actively engaged in discussions about current industry challenges and potential solutions.

We were confronted with a question regarding Rubberized Asphalt. What is the actual situation in Europe? Costis Keridis, with extensive experience in road infrastructure, shared his valuable insights. What are the contractors' myths about rubberized asphalt? The primary concerns are the ruining bitumen storage tanks, the necessity of special equipment, and the that the Asphalt mix blend design cannot be varied. These seem to be very simple excuses. However, the reality is different: Plant production reduction by approx.30% or Application cost is similar to other modified mixes (SBS,ECA etc). After considering all available information, we can conclude that the benefits of rubberized asphalt are many and they include reduced thermal cracking, rutting, ice disbonding, and increased aging resistance, flexibility, and raveling. This is only a portion of the complete picture described during the workshop.

On the 29th, during the Recycled Tyre in Building Construction workshop, participants had the opportunity to visit the Concrete Structure Labs. We observed diverse materials, such as recycled steel fibers in concrete, recycled aggregate in concrete, touched recycled steel fibers and recycled textile fibers with our hands. We walked through the entire laboratory and studied in detail the stages and process of testing materials, so we gained a comprehensive understanding of the manufacturing processes.

Following this, a series of presentations and lively discussions took place. The question of whether rubber and concrete can be combined was addressed by Johan Engdahl of Rubber Concrete, who presented compelling possibilities. Many experiments were showcased, revealing considerable experience and innovative products. During the presentation, product samples were provided, allowing attendees to touch and try them for a hands-on experience. Making tires into concrete is a new technology. However, the process, obstacles, and solutions were described in detail during the entire production phase. A significant portion of these applications is designed for horsekeeping, offering ecological and improved conditions for horses.

Steel Fibers and Recycled Aggregates in Concrete mix. Ing. Corrado Barbero from BOTTA described the cautious approach to this process. Manufacturers know there are some difficulties in using recycled products, such as their confrontation and a tendency to stick to the operators' clothing. However, this issue was solved by implementing special equipment, making it possible to distribute the quantity of fibers required for the chosen mixture within the mix. Overcoming these technical difficulties, we can improve concrete characteristics to such an extent that a certain amount of iron's bars that was previously necessary can be eliminated.

We also discussed other topics in the recycled materials sector, such as RTMs in Concrete and Cement-based applications and optimizing tyre rubber-concrete formulations for scaling up to lightweight paving applications.

We want to express our gratitude to all the speakers:

Ing. Marco Benso from Città Metropolitana “Rubberised Asphalt the cautious approach of the Public Administrations and the role to play.”

Sabina Nicoletta from Fondazione Ecosistemi “How to overcome the obstacles: the role of Replan project”

Ricardo Ayala from Flexofibers “Recycled steel fibres in on-site applications.”

Prof. Marco Valente, Dr. Matteo Sambucci from La Sapienza University “Optimizing tyre rubber-concrete formulations for scaling-up to lightweight paving applications.”

José Lucas from ITeC “The steps to implement the GPP”





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Innovative use of Recycled Materials in Road Pavements: A Spotlight on the Warsaw Conference "Modern road pavements 2023"

The RE-PLAN city life project attended a conference on Modern road pavements, and we are ready to share the experience with you. "MODERN ROAD PAVEMENTS - Recycling in road pavement structures" 2023 was held on the 18th of October in Poland, in Warsaw.

The Conference is an excellent opportunity for all manufacturers and professionals in the field of road infrastructure, that's why it was attended by more than 100 participants from industry, Universities, Research Organisations, and Public Bodies. Among the discussed topics were asphalt mixtures with recycled materials, road pavement structures, pavement rehabilitation, and how to make components more ecological.

Why is recycling becoming a necessity for infrastructure projects in the construction industry? The circular economy forces manufacturers to reduce the consumption of natural resources, and recycling in road construction is a game-changer in this case. It's not only eco-friendly but also a smart way to save materials and energy. The consumption of materials (e.g., aggregates) is significant, and the production, transportation, and construction processes require a lot of energy.

The application of recycling is highly beneficial in constructing new roads and in repairs and reconstruction. It even helps repurpose waste from other industries. Moreover, recycling can potentially be applied to the subbase and lower and upper pavement structural layers.

However, making it happen depends on regulations and technical requirements. Researchers and construction companies must get creative, research, and assess the economic and environmental aspects. That's why disseminating knowledge to all participants in the construction process is the key to success.

RE-PLAN CITY LIFE project aims to raise awareness about the Circular Economy opportunities for tyre recycling materials on roads, especially in rubberised asphalts. That's why ETRA was kindly invited to attend, make a presentation, and share many years of experience with the RE-PLAN CITY LIFE project.

Why is this profitable method still rare among contractors?

Rubberised asphalt has been demonstrated as technically viable and more sustainable through experiences and demonstrations in many countries, confirming their feasibility and benefits. Recycled rubber plays a crucial role in enhancing the performance and durability of road asphalts. It can be incorporated in two primary methods: the wet method, involving adding powdered recycled rubber to hot bitumen, and the dry method, where rubber granulate is directly mixed with aggregates. The specific approach chosen depends on the process and mix design, allowing for the optimization of various performance aspects.

The first documented application of this technique dates back to the 1950s in the United States. This pioneering method has continued to gain momentum due to its significant success in enhancing performance. In contrast, Europe has slowly embraced these innovations and moved beyond demonstration projects. Nevertheless, initial efforts to introduce this technology in the 1980s have played a pivotal role in raising awareness and cultivating technical expertise in various European countries.

Collaborating with RECYKL

Despite the promising potential of these applications, they have not yet gained widespread implementation as they should, mainly due to persistent resistance and various obstacles.

RE-PLAN CITY LIFE conducted an analysis to identify the main obstacles to using Recycled Tyre Materials (RTMs) in Roads and Transport Infrastructures as well as solutions to be promoted and implemented through the project. We described them in detail, clearly showing the current situation and future scenarios. The presentation also included recent innovation developments by the company RECYKL about using recycled textile in road applications in Poland.

For the first time, waste textile resulting from tire recycling has transformed into a professional-grade product for road construction as a stabilizer and dispersed reinforcing additive. This development marks the completion of the ELT recycling cycle, enabling nearly 100% tyre recycling.

Large-scale production has started in Chełm, Poland, with support from the Engineering Procurement Contracting and Commissioning (EPCC) company Zeppelin. Any player worldwide has the opportunity to establish such a factory and provide standardized products to road construction companies.

The product enhances resistance to rutting, fatigue, and cracking, as well as water and temperature effects. During the event, the poster session was held, where Ir. Zaprzalski from RECYKL elaborated on the advantages of incorporating textiles in road construction. In this context, the diverse opportunities and innovations already developed and tried within the sector were observed. However, these advancements often appear fresh and unverified because of limited information and networking among key market participants. RE-PLAN CITY LIFE is committed to breaking this cycle by disseminating valuable insights and increased awareness about recycled tyre materials.



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Sustainable Solutions with Recycled Materials at the Building Exhibition "SAIE" in Bari

SAIE is the Italian exhibition that represents the largest community of companies, professionals and associations in the construction sector. This year SAIE recorded the highest numbers ever: 407 companies on display , +64% compared to 2021, and 25,527 visiting professionals (+35%).

SAIE is a strong commercial multiplier for the market, a moment of reflection and comparison for the sector and the reference appointment with the operators of the sector to discover the excellence of the entire construction supply chain, through paths dedicated to the key themes of sustainability, innovation, energy efficiency and digital transformation. The event garnered significant attention with 123 training conferences and 25 special initiatives, as well as the support of 75 trade associations.

In this context, ETRA, in collaboration with ANTEL, organized the workshop: "Circular Economy in Construction for environmental sustainability, research, strategies, innovations and experiences on the reuse of recycled materials". This national event addressed technicians of both the private and public sector.

The presentations were focused on building application of Recycled Tyre Materials (RTMs), spanning from rubber, steel, and textile ion concrete to thermal and noise insulating products and applications done with the rubber and textile. Also Urban and Sports applications were described as the Fair attracts a really wide spectrum of interests. The workshop was supported by some speakers and partners from the RE-PLAN CITY project.

One of the topics covered during the session was: The use of RTMs in cement-based mortars and in the precast concrete industry. In particular, it was also discussed how to manage new cement-based composites. Prof. Alessandro Fantilli from Politecnico of Turin (partner of Replan) provided insights into the process and revealed valuable findings, such as the increase in strength reduction factor with presence of recycled carbon fibers.

Prof. Dora Foti shared knowledge on the topic of Innovative and eco-sustainable concrete produced from the reuse of waste materials for circular construction. It addressed the challenges, explained also by Fantilli, of the depletion of natural aggregates and need to find replacement. She worked on plastic recycling, with a specific focus on Polyethylene Terephthalate (PET). An Experimental Campaign was conducted to discover best practices for incorporation PET recycled materials into construction products. The tests showed that the inclusion of PET fibers in concrete enhances its ductility. Moreover, PET bars can be employed as alternatives to welded or reinforcing steel links in conditions with high humidity and steel corrosion issues.

Prof Bruno Marabotto revealed the topic of the use of recycled rubber in sports facilities and artificial grass fields, potential and contradictions, which is a common concern. Dr. Ettore Musacchi continued the discussion with another promising application: panels for thermo-acoustic insulation with recycled textile fibers. The growing need for isolation presents new challenges, and using recycled textile fibers from tyres is one of the solutions. Various products and their technical characteristics were described, along with applications of rubber mortar for these purposes, accompanied by examples and works carried out.

This enlightening session provided a platform for specialists and manufacturers in the industry to not only share valuable knowledge but also to discuss practical experiments, tests, and working solutions while considering all the associated advantages and challenges.

Among the speakers there was also Dr. Sergio Saporetti, an Officer of the Italian Ministry of the Environment committed to the preparation of the Green Public Procurement for the building sector. They analyzed the mandatory criteria and contractual clauses of the Minimum Environmental Criteria for constructions.

The workshops allowed a lively interaction among speakers and participants who shared their experience and willingness to cooperate on expanding best practices. The RE-PLAN CITY project was also presented, as it combines many discussed topics revealed at SAIE and aims to use recycled tyre materials in diverse areas of the city's infrastructure.

More information about the event: <https://www.saiebari.it/en/>

