

**Topic of doctoral dissertation: Material as design inspiration.
A study of the influence of recycled material properties
on the design of urban furniture form**

This dissertation developed a set of recycle-based materials that can be used as an alternative to the dominant materials in the industry. The selected materials underwent a series of laboratory tests to see if such a material has a chance to exist in the design of urban furniture. Different material processing technologies were also tested to select the most optimal in terms of quality and economically justified one. A set of urban furniture was then designed, based on modular, repetitive elements, using the developed material.

The resulting final design of the urban furniture responds to the set design assumptions. The use of recycled materials in a project dedicated to public areas will help educate users about the necessity of waste separation and the opportunities arising from it. The applied technology of molding furniture elements will allow cost-effective production, both as a single unit and on a larger scale, which will have a real impact on the reduction of plastic waste.

Experiments with materials such as plastic blends and tire rubber, for example, have proven that this material is an interesting alternative for urban furniture designs. The variety of forming techniques adds further possibilities in shaping the form, and they are not limited to ready-made profiles or boards.

In order to ensure the competitiveness and market success of this type of product, the project is mainly addressed to public and private institutions responsible for arranging urban zones or deciding on their selection. For such institutions, the project can also have great promotional significance, spreading environmental awareness. The problem here, however, may be that purchases of this type of equipment are mainly carried out in the form of tenders, where most often the price remains the only selection criterion. It is therefore very important to emphasize the educational factor of the project and its benefits.

Added, equally important value of the above project is its modularity, which, in contrast to the solutions prevailing on the market, allows for easy and quick installation and any configuration of the furniture not only at the stage of planning the zone, but also during its use. Depending on the needs, the furniture can be configured and dedicated to specific zones and their users. It can also be stylistically adapted to different spaces of a modern neighborhood, an old city or a park.

The use of two base elements from which we can also build objects with auxiliary functions such as bike racks, railings, tables, flower pot covers or baskets, etc., greatly expands the possibilities of use and allows for homogeneous, stylistically consistent furnishing of urban zones, which is lacking from the existing solutions on the market today.

The simplicity of the elements, small size of the modules and ease of installation also mean that the maintenance costs of the facilities will be low, as the entire piece of furniture will not have to be dismantled for repair. And this is an important factor for institutions that manage and maintain the standard of urban furnishings on a daily basis.

The project is just the beginning of thinking about recycled plastics as a basic material for use in public places, where through the scale of application we can reduce the problem of waste, and at the same time spread awareness among users about the sense of waste separation and the possibilities of using recycled material 100%, and not just as admixtures to new material.