



Site-won asphalt in the light of the applicable law

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ABSTRACT:

The article covers the issue of changing the provision in the Regulation of the Minister of Climate and Environment on the criteria for the loss of waste status for site-won asphalt. The necessity was indicated to recycle complete road construction rubble material in order to achieve a closed cycle economy, the aim of which is to minimize waste generation and increase its reclamation and reuse.

KEYWORDS:

site-won asphalt; asphalt granulated product; recycling; bituminous mixtures

1. Introduction

For several years, Poland, using its own funds and funds obtained from the European Union within the available programs, has been building a network of motorways and renovating national and local roads. Many roads are designed and constructed through the so-called new track. However, motorways or expressways often follow the track of the existing routes. During the construction of these roads or renovations, the material is obtained in the form of the so-called milling cutter, treated to this day as waste. Site-won asphalt or concrete obtained during milling is, on one hand – a waste material under the current regulations, and on the other hand, a complete component of asphalt mixes. For several years, many organizations and associations of asphalt surface contractors have been making efforts to change this unfavorable provision.

During the implementation of tasks titled in the National Road Construction Program for 2014-2023 and in the Program for the construction of bypasses for 2020-2030, according to the estimated data of GDDKiA, the use of the destruct can save up to PLN 400 million. Further savings will result from lower extraction of new aggregate and transport to the construction site [1, 2].

In the coming years, it will also be necessary to replace the wearing layers of the surface of expressways and highways built in 2008-2012 (performed regularly over a period of 12-15 years). During this work, it will be possible to obtain huge amounts of very valuable destruct. This is due to the fact that these surfaces were built with the use of high-quality crushers. They often contained polymers and elastomers modifying the binders as well as additives improving the adhesion properties of the binder to the aggregate. Destruct obtained from such roads will not be wasted, but a very valuable material for use in new asphalt mixtures [3]. Destruct, as property of the State Treasury, must be properly managed by the General Directorate for National Roads and Motorways. In order to minimize the amount of waste and increase its recovery and reuse, it was necessary to exclude asphalt from the waste category. In this way, the recycling of asphalt pavements will be a step towards achieving a circular economy.

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2. Asphalt destruct

Depending on the stage of obtaining and preparing the reclaim, certain materials are distinguished that must be assessed and qualified before re-use [4]. Site-won asphalt requires evaluation and, as a rule, processing before it can be used in a new asphalt formulation. It is a material intended for recycling, in the form of milled asphalt layers or slabs broken from the asphalt surface or asphalt mix rejected or in the form of surplus production. According to PN-EN-13108-8: 20216 "Bituminous mixtures – Requirements – Part 8 – Reclaimed asphalt", a distinction is made between: reclaimed asphalt RA, asphalt granulate (feedstock of reclaimed asphalt) and special asphalt granulate [5-8].

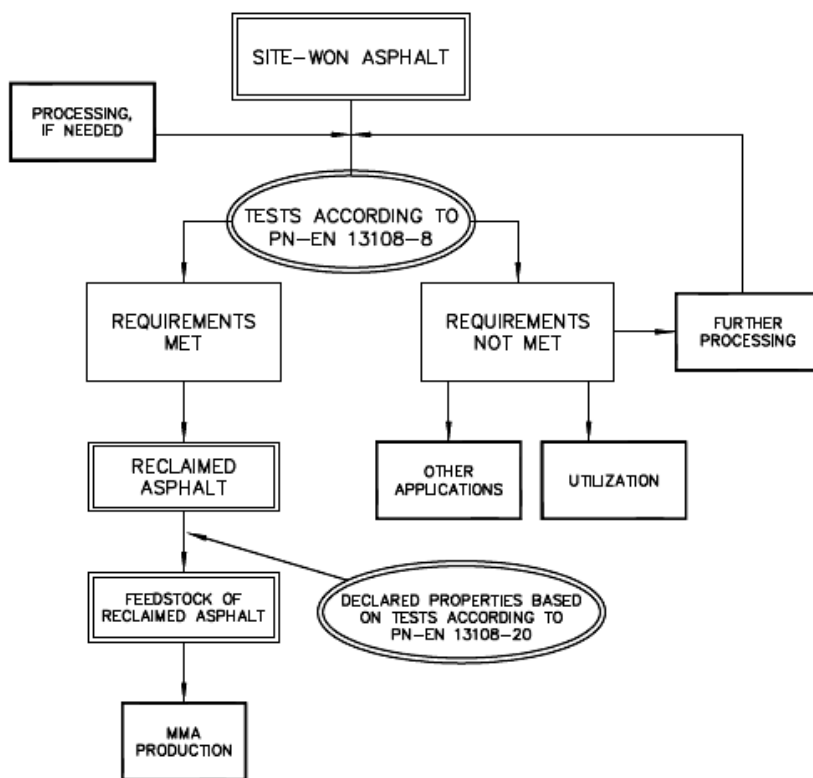


Fig. 1. Diagram of the process of assessment and qualification of the material intended for hot recycling [5, 9, 10]

Until the beginning of 2022, the technical specifications allowed for the use of the destruct in the mixture in the amount of up to 30%, replacing the new aggregate with it [11]. There have been and are many research projects carried out in cooperation with technical universities, aimed at developing methods and technologies that will allow for greater use of asphalt granulate in asphalt mixtures. We should strive for the results obtained by the closest neighbors of Poland, who use 70% of the reclaim in the "hot" methods of producing asphalt mixes [5, 12, 13, 24]. The durability of new pavements related to the resistance to raveling and resistance to water and frost is improved by the use of asphalt granules. Asphalt destruct is characterized by properties that made it possible to remove it from the waste status. It is about widespread use for specific purposes, the existence of a demand for a given material, meeting technical conditions specified in standards or other regulations applicable to a given product and not causing (as a result of use) harm to the environment and human health.

At the same time, it is important to implement such legal conditions that will make recycling profitable while maintaining the appropriate quality of materials. By eliminating destruct as waste, entities receiving reclaimed asphalt no longer need to have appropriate permits for waste management and keep records of waste. This will significantly increase the profitability and ease of management of non-renewable raw materials such as aggregates and asphalt.

The ecological aspects of this procedure cannot be ignored. Recycled asphalt recycling technology is environmentally friendly. The problem of transport, storage and storage of the cutter is eliminated. Replacing aggregate with site-won asphalt causes a reduction in the extraction of less and less numerous natural resources, dust emissions, reduction in transport, thus pollution and noise. There will also be a reduction in energy consumption [14-16].

Based on the published information, large discrepancies in production and the degree of utilization of road reclaim in various European countries can be observed.

Table 1

Obtained site-won asphalt and its reuse in bituminous mixtures
(Source: EAPA, Asphalt in Figures 2018) [17, 18]

Country	Available destruct in 2018	Reuse in hot and warm production
	Mg	%
Austria	1,900,000	70
Belgium	1,687,000	100
Croatia	200,000	n.d.
Czech Republic	2,700,000	12
Denmark	1,185,000	68
Finland	1,300,000	100
France	7,817,000	73
Germany	13,000,000	82
Great Britain	6,100,000	30
Hungary	200,000	70
Italy	9,000,000	n.d.
Norway	1,004,000	34
Slovakia	150,966	82
Slovenia	106,200	24
Spain	1,165,000	76
Turkey	965,000	1

Although the use of road reclamation in the construction of new roads and in renovation with the use of various technological solutions has been developing in Poland for several years, as compared to other European countries it is still at a very low level. Countries in the field of road construction are striving for the maximum reuse of asphalt granulate in the production of new asphalt mixtures. In Poland, the use of the destruct has faced many barriers such as:

- legislative (including the destruct as waste);
- poor technological preparation of designers;
- from investors' point of view (the fear of obtaining a mixture with worse properties);
- inexperience of contractors;
- lack of proper mass production equipment;
- also possible low economic and ecological awareness of people who decide to use this material.

Most often, in Polish conditions, deconstruct is used in the "cold" method for hardening roadsides, road foundations, construction of service and access roads, exits, etc. The use of granules in "hot" methods is still not used frequently enough. In order to protect the environment, the "warm" method is also used, which, thanks to lower temperatures in the mma production process, reduces the carbon footprint and the impact on the atmosphere [13, 19].

In 2018-2019, GDDKiA donated about 35 thousand tons of reclaim to local governments. About 15 thousand tons were used to secure the roadsides, and about 10 tons were sold through a tender. The total amount of the deconstruct was over 160 thousand tons, of which almost a half remained unused. It was waste intended for disposal, instead of being a component of new mineral-asphalt mixtures thanks to its valuable properties [3, 20]. This can be considered an economic waste. Therefore, one should strive for changes in the use of the deconstruct, seeing the huge potential for saving considerable financial resources.

3. Ways of obtaining site-won asphalt

For the effective acquisition of reclaim that can be used for the production of new asphalt mixtures, the essential task is to recognize the surface to be milled. One of the basic tasks is to determine if the pavement contains a tar binder. If the test shows the presence of tar in the pavement, this material cannot be used for the production of mineral asphalt mixtures and is disqualified. The most advantageous surface for obtaining good quality reclaim are roads with layers containing from 92 to 97% of mineral particles and 3÷8% of asphalt. Demolition mixes should be selectively milled to avoid discrepancies in the results when assessing the homogeneity of the granules. Milling with layers allows to rank the deconstruct depending on the depth and type of the milled road layer. When dealing with the demolition of pavements from several years ago, for which there are documented recipes, this task is easier. In the case of roads that were previously renovated with many types of mixtures, the reclaimed material should not be used for wearing courses or binding layers.

- **Cold milling of the existing asphalt layers**

This is the primary way to get the deconstruct. This technology has the following advantages: the ability to precisely remove only the damaged layers of the road surface, obtain a surface with the desired inclinations, slopes and textures, ease of work within sewage manholes or inlets, and minimal traffic difficulties in the event of the need to resume traffic on a given road section. Like any other method of acquiring the deconstruct, this one should follow the milling plan, which should include or at least take into account the documentation of the drilled boreholes, the selection and description of the milling technology, milling parameters and the estimated amount of reclaim, the method of its transport and storage, and the purpose of this material.

- **Demolition using the traditional method, reaching the full depth of the surface along with crushing the bituminous mixture**

This method produces large pieces of asphalt that require further grinding. The reason is the use of bulldozers, front loaders or excavators for demolition. In this way, relatively small amounts of reclaimed material are obtained, which must be combined with others in order to obtain valuable qualified reclaim and asphalt granulate. In addition, the method carries the risk of contamination of the cutter, e.g. with soil or breakage from deeper layers of the road, because the machines used do not allow for the precision of works.

- **Crushing the excess of the produced bituminous mixture or the discard during its inbuilding**

This method of obtaining the reclaimed material is caused by many factors, such as a change in the working recipe of the asphalt-asphalt mixture, start-up or cleaning of machines used for the production of the mixture, poor quality of the mixture and waste directly during its

distribution. Most often, in order to obtain the right amount of reclaim for the production of a new mixture, several different batches of reclaim must be combined. It should be remembered that such material should be comminuted and thoroughly mixed, and its suitability for incorporation should be analyzed [10].

4. Regulations on the classification of reclaimed asphalt in force until the end of 2021

Destruct asphalt until November 2021 in the light of the regulations (Act of December 14, 2012 on waste (Journal of Laws of 2019, item 701), depending on its composition, was classified as waste in subgroup 03, under code 17 03 01 – asphalt tar-containing or, under entry 17 03 02 – asphalt other than the tar-free one mentioned in 17 03 01 [21]. Unfortunately, this was not a by-product for which the regulations were completely different.

Waste, apart from classifying it in the regulations, should meet one more important condition, namely it would have to be a material that its owner is obliged to or wants to get rid of. Reclaimed asphalt did not meet this condition. Producers of asphalt mixtures have been willingly and more increasingly recycling and using it.

5. Actions taken to change the classification for site-won asphalt

Talks aimed at introducing a regulation allowing the full use of reclaimed asphalt were initiated in 2019 by GDDKiA, members of PSWNA, OIGD and other organizations including representatives of the road industry. Unfortunately, VIEP, CIEP, NSA did not agree with the arguments used. In 2020, several petitions and interpellations were issued to the then Minister of Climate regarding the amendment of the act from 2012 on waste. After years of waiting for appropriate regulations, on July 8, 2021, the draft Regulation of the Minister of Climate and Environment "on the definition of detailed criteria for the application of end-of-waste conditions for asphalt waste" entered into force. The idea was to define the conditions under which the destruct would cease to be treated as waste. Then its use will be facilitated, without any doubts as to its quality and applicability. For economic operators, this change would considerably simplify the related trade and administrative procedures.

In accordance with the required procedure, on July 8, 2021, the draft Regulation of the Minister of Climate and Environment on the definition of detailed criteria for the application of end-of-waste status conditions for reclaimed asphalt waste was submitted for notification by the European Commission [22]. It was the last stage before the act was signed by the Minister of Climate, which was to result in greater access to this raw material. After three months for possible comments and requests from the representatives of the EU Member States and the European Commission, the notification process was completed and the project was adopted by Polish legislation. Many years of efforts by representatives of the road industry to regulate the status of reclaimed asphalt have come to an end.

In November 2021, an ordinance of the Minister of Climate and Environment on the definition of detailed criteria for the application of end-of-waste conditions for reclaimed asphalt waste was published (Journal of Laws, item 2067). Then it was subject to modifications and the new ordinance of December 23, 2021 (Journal of Laws, item 2468) was published in the Journal of Laws on December 30, 2021 and – as the previous ones – concerns the determination of the detailed conditions for ending the status of reclaimed waste asphalt [23].

6. Conclusions

Actions taken jointly by participants in the road and highway construction process, decision-makers and state institutions to use more and more effective use of asphalt decomposition have led to the end of a long-term battle to change the regulations on the qualification of this building

material. It was in the interest of entrepreneurs and in the interest of the state, guaranteeing environmental protection and the possibility of developing road construction. The purpose of the amendment was to transform the provisions of the EU waste package directives, and thus to make a big step towards a circular economy.

The ordinance of the Minister of Climate and Environment on defining the detailed conditions for ending the status of waste for reclaimed asphalt waste entered into force on January 1, 2022. rules for a recycling system run by a holder of reclaimed asphalt to demonstrate compliance with the end-of-life conditions for reclaimed asphalt – these will apply from 1 January 2023 [23].

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Asfalt z placu budowy w świetle obowiązującego prawa

STRESZCZENIE:

W artykule poruszono zagadnienie zmiany zapisu w rozporządzeniu ministra klimatu i środowiska dotyczącego kryteriów utraty statusu odpadów dla destruktu asfaltowego. Wskazano na konieczność recyklingu pełnowartościowego materiału destruktu drogowego w celu osiągnięcia gospodarki obiegu zamkniętego, której założeniem jest minimalizacja powstawania odpadów, zwiększania ich odzysku i ponownego użycia.

SŁOWA KLUCZOWE:

destrukt; granulat asfaltowy; recykling; mieszanka mineralno-asfaltowa