

## Recyclean®: re-use of pavements polluted by PAHs (Polycyclic Aromatic Hydrocarbons)

by Julien WALIGORA / 2019-06-17 16:48:57 / France / 8683 / FR



**Year of commitment** : 2017

**Sustainable mobility** : Roads

**Circular economy and waste management** : Circular economy, Reuse



220 000 €

**Builder**

EIFFAGE Route

**Manager / Dealer**

Département de Seine-et-Marne - CD 77

### GENERAL INFORMATION

Recyclean®, a treatment process in place for pavements polluted with polycyclic aromatic hydrocarbons (PAHs), developed by EIFFAGE Route, was awarded the Road and Streets Innovation Committee (CIRR) in October 2015. This system, supported by the Infrastructure Department of Transport (DIT) of the Ministry of Ecological and Solidarity Transition, with the assistance of IDRRIM and Cerema, aims at supporting innovative projects developed by the French road industry, allowing them to benefit from a concrete experimentation on the national network. The Department of Seine-et-Marne (CD 77) wanted to experiment in 2017 the Recyclean® process within the framework of a maintenance operation of 1 km of its network (6000 m<sup>2</sup>), with the technical support of various departments of Cerema.

Recyclean® makes it possible to create a road sub-layer made of 100% recycled materials. The process is implemented with EIFFAGE Route's ARC 1000 or ARM 2500 mobile reprocessing plants. It is applied with hydraulic binder, bitumen emulsion or mixed binders (emulsion + cement). This process of re-using polluted materials contained in pavements is an advantageous solution for building owners, in economic, health and environmental terms.

From the sanitary point of view, the reprocessing of the materials is carried out cold, which strongly reduces the gaseous emissions of PAH, and under bell with damp protection by misting of water at the periphery of the workshops to reduce the possible flight of dust. From the environmental point of view, the materials are reprocessed in the form of a stiffened massif by the binder, which fixes the pollutants and makes it possible to protect itself from the risks of later pollution of the surrounding grounds and the underlying materials.

The traceability of the materials is assured, these remaining on site (reuse). This eliminates any potential error of destination or recovery in the case of an offsite

evacuation. This process avoids the installation of hazardous waste storage facilities (ISDD) polluted materials and does not require filler materials, which saves the natural resources of aggregates and reduce the transport required for the site. This reduction of transport itself induces a preservation of the surrounding road network and a reduction of nuisances to residents.

From an environmental point of view, a follow-up is planned in several phases over two years with characterization of the recycled materials, the surrounding grounds and the underlying pavement materials.

## Progress Status

Delivered

## Data Reliability

Self-declared

## Funding Type

Public

## Website Enterprise / Infrastructure

[http://www.eiffage.com/home/media/actualites/area-news-block\\_\\_inner/liste-dactualites-eiffagecom/5732.html](http://www.eiffage.com/home/media/actualites/area-news-block__inner/liste-dactualites-eiffagecom/5732.html)

## Sustainable Development

### Attractiveness :

The implementation of the Recyclean process has proved very attractive for the Client: the **overall cost of the works** (220,000 Euros) was lower compared to a conventional solution with production and disposal of waste and new materials.

**In terms of innovation, the Recyclean process has enabled the Department of Seine et Marne to implement on its network an innovative solution of reprocessing in place of pavement.**

### Well Being :

The Recyclean process significantly improves the well-being of on-site operators, local residents and multi-level users. From the sanitary point of view, the reprocessing of the materials is carried out cold, which strongly reduces the gaseous emissions of PAH, and under bell with damp protection by misting of water at the periphery of the workshops to reduce the possible flight of dust.

In the construction phase, truck rotations are greatly reduced as there is no disposal of materials outside the site right-of-way and no input of new materials.

The time required for carrying out the work is greatly reduced and the re-circulation of the roadway is faster compared to conventional maintenance solutions with waste disposal and the supply of new materials. In this case, 6000 m<sup>2</sup> of pavement could be reprocessed in one day (1 km long and 6 meters wide).

### Preservation / Environmental Improvement :

The Recyclean Process helps preserve the environment on two levels. All the materials in place on the site are reused, so there is no production of waste or new materials for the realization of the new foundation course.

There is no disposal of polluted materials outside the site, this greatly limits the risk of accidents, dumping of hazardous waste and soil pollution.

### Responsible use of resources :

The Recyclean process makes it possible to re-use all the materials on site, without waste disposal or new materials. During the application of the process, no ton of natural granulate is used. The road sub-layer is thus made with 100% recycled materials . A new wearing course is then applied. This is made of asphalt over a few centimeters depending on the traffic. It consists of natural aggregates but also contains a significant proportion of old recycled mixes (up to 30%).

## Testimony / Feedback

## Governance

Département de Seine-et-Marne - CD 77

**Holder Type :** Local Authority

EIFFAGE Route

**Builder Type :** Construction Industry

Département de Seine-et-Marne - CD 77

**Manager / Dealer Type :** Public

### Business Model :

The overall cost of the operation with application of the Recyclean process is 220000 Euros. The overall cost of a typical maintenance solution with waste disposal and the addition of new aggregates has not been evaluated before work. However, as part of the project, the only disposal of materials polluted by PAHs (1000 tons) in a hazardous waste storage facility (ISDD) would have cost 200 000 Euros, on the basis of 200 Euros per ton of material. This evacuation cost alone represents the overall cost of the operation.

## Sustainable Solutions

System for reducing particles by misting water

### Description :

When applying the Recycleclean process, a water misting system (see visual) is deployed around the reprocessing plant. This solution allows site operators and local residents not to be exposed to dust or particles of polycyclic aromatic hydrocarbons (PAHs), which are folded to the ground.

- Air quality

Company (es) Website :

 **Eiffage Infrastructure**

78140 -



## Contest

### Reasons for participating in the competition(s)

The strengths of the Recycleclean® process are:

- It allows the reuse of polluted pavement materials, while ensuring a good sustainability of the infrastructure with a level of mechanical performance similar to that obtained with conventional materials.
- It is a real example of circular economy, pavement materials remain in the roadway.
- It responds to the strong problem of the evacuation and the fate of polluted materials, the preservation of natural resources, the reduction of nuisances related to road works.

### Building candidate in the category



Grand Prix Infrastructure Durable

