

HIGH-PERFORMANCE FIRFLEX

This high-performance system is a wearing course surface treatment finish to give paving non-slip and fuel-resistant properties.



High-performance design paving

High-performance Firflex is a wearing course finishing system which consists of applying resin onto flexible and rigid paving to give roads the mechanical performance of a wearing course.

PUMA resin

The treatment is composed of a polyurethane-methacrylate (PUMA) resin and a mineral filler with different types of aggregates.

This resin is a flexible material that retains its flexibility performance and provides high

resistance to wear and tear and traffic stresses.

PUMA resin offers a solution to problems associated with spills and areas with adhesion problems, giving the paving non-slip and fuel-resistant properties.



Main features

- Applied in a uniform layer of between 2.5 and 3 kg/m²
- Can be applied on flexible and rigid paving
- Withstands all types of traffic
- High resistance to wear and tear and traffic stress
- Opening to traffic in 60-120 minutes
- Non-slip
- Fuel-resistant
- Decorative

Customisable colours

The personalised design allows for a wide variety of colours to allow better lane visibility, for example. Long-lasting colour is guaranteed, especially against UV light.

This product complies with the current non-slip requirements for pedestrian, road and high-capacity traffic.



Application

The surface must be clean, dry and free from dust, waste and contamination.

For concrete surfaces, the pore or texture must be opened and binder resin must be used. New concrete pavements must be completely set (at least 28 days).

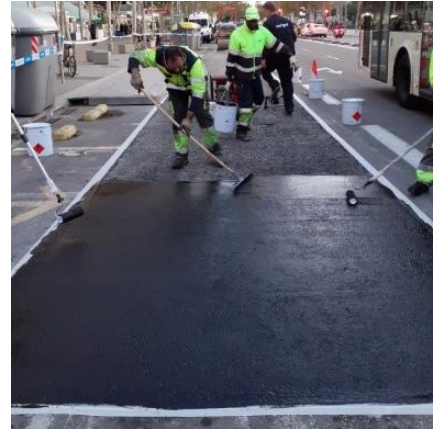
The application temperature is between 5°C and 30°C.

A uniform layer of resin is applied at a rate of between 2.5 and 3 kg/m² (depending on the condition of the surface).

The road may be opened to traffic between 60 and 120 minutes after application depending on the ambient temperature.

Properties

Application temperature	5°C - 30°C
Mix duration/treatment time at 20°C	15-18 min
Drying time at 20°C	60-120 min
Tensile strength (ISO 527)	11.0 mPa
Elastic modulus at 20°C	82.4 mPa
CS-17 Taber abrading wheels, 1 kg, 1000 cycles	75 mg
Viscosity at 25°C	460 - 730 mPa·s
Density at 25°C	1.30 g/cm ³



Mechanical properties test

The IFSTTAR assessment report tests material using a FABAC machine test.

FABAC machines are used to test the fatigue behaviour of continuous reinforced concrete pavements, applying a load of between 0.5 and 5 km/h. The tyres used for this experiment are Michelin 315/80 R22-5 156L multiway 3D XZE.

The surfaces were subjected to three million loads (double axle half shafts loaded at 65 KN) with a loading speed of 3.6 km/h.

To study the evolution of the samples, several tests were carried out at certain stages of the loads, using the machine at 500,000, 1 million, 2 million and 3 million cycles.

The measurements consisted of SRT (pendulum test), MTD (mean texture depth) and DFT (coefficient of longitudinal friction generated between a rubber pad and the road during braking).

Three test areas allowed the Wehner and Shultze (polishing resistance) tests to be carried out, measuring the depth of wear in order to quantify the possible degradation of the samples tested caused by this problem.

Testing began on 26 September 2017 and ended on 7 February 2018. The climatic conditions were representative because they ranged from relatively summery temperatures at the beginning of the test to winter ones at the end of the test.

In conclusion, the experimental sample was subjected to 3 million cycles and 9/10 of test pieces did not undergo significant variation.



Braking test

A braking test was carried out at the LCPC track in Bouguenails, France.

The test was carried out using a Peugeot 406 equipped with different distance and braking sensors to measure braking distance, vehicle speed and brake application time.

Braking distances were performed on samples at different speeds (50, 70 and 90 km/h) with ABS.

Tests were performed on each sample, including a reference sample of new and old asphalt pavement, thick Firflex, thin Firflex and precast Firflex.

Sample name	Speed (km/h)	Braking distance (m)
New Asphalt	50	15.8
	70	27.4
	90	43.8
Old Asphalt	50	17.1
	70	36.1
	90	48.1
Thin Firflex	50	13.7
	70	24.7
	90	37.7
Thick Firflex	50	14.5
	70	26.5
	90	43.0
Precast Firflex	50	14.9
	70	25.7
	90	40.7