INFLUENCE OF ASPHALT CONCRETE ROAD COEFFICIENT ON THE ROAD SURFACE

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Annotation

This article presents information about the traction coefficient of pavement with automobile tires.

Keywords*:* pavement, tire, traction, longitudinal, transverse.

Modern highways are complex engineering structures that ensure high-speed traffic flow. The quality of road repair and maintenance works is a guarantee of increasing road service life, capacity and ensuring traffic safety on the road.

The traction force on the wheels of a car depends on the engine power, and it can be fully utilized only if the driving wheels have sufficient contact with the road. The ratio of the maximum traction force P_k on the wheel to the vertical load G_k on the road surface is called the traction coefficient and is denoted by a letter.

Depending on the direction of the sliding force acting on the wheel, two types of friction coefficient are distinguished:

1. Longitudinal traction coefficient φ_n. The value of this coefficient corresponds to the moment when a moving wheel begins to slip or slip while turning or braking, when no lateral forces are acting on the wheel. It is used to calculate the distance traveled by the vehicle during emergency braking and to estimate the vehicle's ability to shift.

2. Experiments have shown that the coefficient of adhesion is practically unchanged when the braking wheel slides, forming an angle to the plane of the wheel, the transverse adhesion coefficient φ_n is the transverse value of the coefficient of adhesion when the driving wheel slides under the action of a lateral force, forming an angle with respect to the plane of the wheel (with the wheel sliding sideways, standing on a circle). founder. The coefficient φ_n expresses the stability of the vehicle when traveling through a curve of small radius.

A large number of experiments have shown that the condition of the road surface has a greater influence on the values of traction coefficients than the type of road surface.

In any pavement, the hard mineral particles on them make the pavement rough, and fall into the tread rubber of a wheel passing over them. When the wheel slides, they elastically deform the rubber, and the resistance of the rubber is the primary cause of the resistance of the wheel to sliding on the pavement surface. As the pavement wears, the roughness of the pavement decreases, and consequently the grip of the pavement on the wheel decreases.

The depressions between irregularities in the pavement surface are filled with dirt, dust, and tire tread products when wet, reducing chip penetration into the rubber. The wet film wets the tire-tire contact area and acts as an oil that separates the tire from the tire. All of this reduces the interaction coefficient. In high-speed driving, the tire does not have time to fully deform because the duration of the pavement test is not long enough for this to happen, so pavement irregularities do not sink into the tire as much. As speed increases, the bond coefficient decreases. The coefficient of grip decreases with increasing speed on dry surfaces not much more than on wet surfaces.

Aquaplaning can occur on wet surfaces when the tread elements are spread too far apart or their height is reduced and split. This phenomenon occurs when water accumulates between the tire and the road surface at the beginning of the tread area that has not had time to extrude. A puddle of water forms under the tire, which creates a hydrodynamic lift force that reduces the pressure of the wheel on the pavement. When the water layer on the pavement is a few millimeters thick, at speeds of about 80-100 km/h the mutual force of the pavement on the front wheel disappears and the vehicle becomes uncontrollable.

The longitudinal traction coefficient φ_n of fully blocked (circled) low-tread tires on smooth wet cement concrete pavements can be assumed to depend on the parameters of Table 1 averaged over speed:

Table 1

Speed, km/h	30	40	60	80	100	120	150	175
Clutch coefficient	0,50	0,45	0,39	0,35	0,32	0,29	0,26	0,24

The longitudinal traction coefficients at 60 km/h, depending on the road surface condition, will have the values of Table 2 below:

Table 2

Coverage	Significance φ_n
Dry, rough	0,7 or more
Dry, smooth	0,6
Wet	0,5
Soggy	0,4-0,3
Dirty	0,2-0,3
Ice	0,1-0,05

The contact conditions of pneumatic tires with the road surface depend on weather conditions. The values of traction coefficients vary greatly throughout the year, increasing in summer and decreasing significantly in winter slippery conditions, during which anti-slip materials are sprayed on roads to increase traction or sometimes studded tires are put on car tires. φ_n=0,6 when driving on a dry, clean surface and at a speed of 60 km/h.

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