

Technology for Efficient, Short Time Repair of Airport Pavement

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1. Introduction

When an abnormality is discovered in an airport runway or taxiway and emergency repair is performed, it is desirable to carry out the repair with hot mix asphalt. However, due to material procurement or time restrictions, repairs must sometimes be made using cold mix asphalt. Cold mix asphalt is easy for airport administrators to keep on hand at all times as an emergency repair material. On the other hand, there are some issues such as its initial stability after paving, durability. As cold mixtures with improved performance have become available in the market in recent years, we conducted various types of tests to grasp their properties.

2. Outline of tests

As sample materials, we prepared four types of cold mix asphalt (A: cutback, B: cutback (water reaction curing type), C: resin (acryl), D: resin (epoxy)), together with a hot mix asphalt (dense grade asphalt concrete (20)) as a comparison material, and conducted various laboratory tests (Marshall stability test, wheel tracking test, Cantabro test, tensile adhesion test, unconfined compression test, simple pothole test) to confirm their initial stability, durability during use, etc.

3. Test results

An example of the test results is presented below. As can be understood from both the standard Marshall stability test and the standard pothole test, the initial stability and durability of the cutback type and resin type differ greatly. However, when using resin-based materials,

it is necessary to mix the main solvent and curing agent and knead this mixture with the aggregate. In addition to the fact that these operations are considered handling of hazardous materials, surface leveling with a metal trowel is also necessary. Thus, the workability of the resin-based materials also differs greatly from that of cutback asphalt, which requires only spreading, leveling and compaction by rolling.

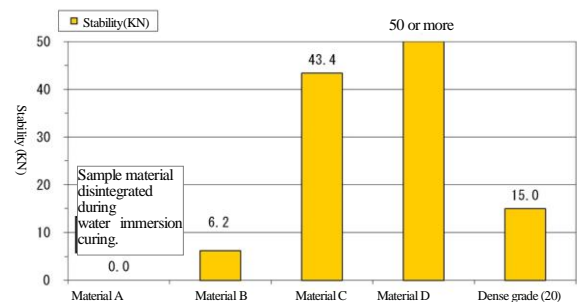


Fig.-1 Results of standard Marshall stability test

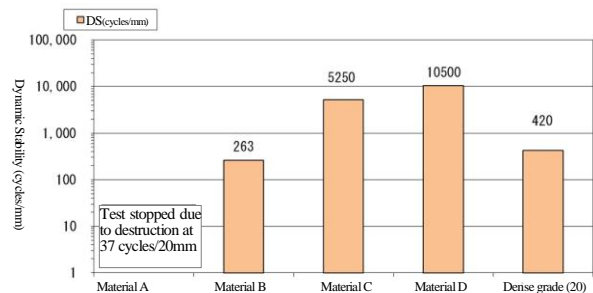


Fig.-2 Results of standard wheel tracking test

4. Future efforts

Basically, airport pavement can only be inspected and repaired at night-time outside of airport operating hours.

On the other hand, the environment for airport operation and maintenance is increasingly difficult due to the increasing loads of aircraft and longer airport operating hours. In the future, we plan to carry out research with the aim of proposing efficient inspection and repair methods for airport pavement, including a further investigation of the properties of cold mix asphalts.