

THE NORDIC BALL-MILL STRENGTH TEST VALUES CORRELATE HIGHLY SIGNIFICANT WITH THE KOUVOLA ROCK AGGREGATE TEST ROAD RESULTS

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In Finland asphalt pavements undergo wear mainly from salting and studded tires. During winter time main roads are salting and studded tires are used in cars about five months (from November to March). In Finland the strength class of the bedrock material used for asphalt paving must be determined by the Nordic ball-mill and point-load tests. In 1990 Finnra built the Kouvola rock aggregate test road to main road 6 (13 parts of different rock aggregates). Each test road part is about 250 m long and the asphalt is gap-graded asphalt (GAC). The average daily traffic volume is 5500 vehicles (ADT 1998). The strength of the test road aggregates was measured by Nordic ball-mill, point-load, Los Angeles, Swedish impact and abrasion tests. The rut depths of the test road were measured in May 1999. On the basis of the results, the correlation between the Nordic ball-mill and point-load tests ($r = 0.87^{***}$) and between the Los Angeles and Swedish impact tests ($r = 0.95^{***}$) is highly significant. Moreover, a clear correlation exists between the Nordic ball-mill and abrasion tests ($r = 0.63^*$) but between the Nordic ball-mill and Los Angeles tests the correlation is low ($r = 0.52$). On the basis of the results of the test road, the Nordic ball-mill ($r = 0.91^{***}$) and point-load ($r = 0.90^{***}$) tests correlate highly significantly with the rut depth. The Los Angeles ($r = 0.74^{**}$) and Swedish impact ($r = 0.61^*$) tests have a clear correlation but the abrasion test ($r = 0.42$) has a low correlation with the rut depth. On the basis of the present study, the correlations between the Nordic ball-mill and point-load tests as well as between these tests and the rut depth are highly significant. The point-load test can therefore be omitted because the Nordic ball-mill test is technically easier to do and suits different rocks, besides being suitable also for quality guidance and control during crushing work.