

Report
Scratch resistance, chemical resistance and weathering
resistance of a coating system of Optimum Car Care B.V.

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1 Introduction

This report describes the determination of the scratch resistance, the resistance to some chemicals and resistance to weathering of a coating of Optimum Car Care B.V.

TÜV Rheinland Nederland B.V. (TÜV Rheinland) offered the tests by means of offer forms 37145 and 37321, dated respectively February 1st and February 27th 2013, which were signed and agreed upon by Optimum Car Care B.V.

Optimum Car Care B.V. submitted coated panels of approximately 10 x 15 cm to TÜV Rheinland for the scratch resistance tests and the chemical resistance test. These samples consist of a thin metal substrate coated with a white primer, a black midcoat and a clear topcoat.

The panels have been registered under sample number 13.0069/1.

Later, Optimum Car Care B.V. sent an aluminium panel of approximately 15 x 30 cm to TÜV Rheinland for the execution of the weathering tests. According to Optimum Car Care, the coating consists of a white primer, a blue midcoat and a clear topcoat. This panel has been registered under sample number 13.0069/2.

2 Investigations

2.1 Scratch resistance of the black coating system

The scratch resistance was determined according to ISO 1518 using a Gardner scratch resistance tester. This method is executed as follows:

A mechanically driven scriber, with a hemispherical point of 1 mm in diameter, is pulled over the coated surface of the test panels while the load is increased until the point of the scriber is scratching through the coating onto the substrate. The minimum load (in Newton), at which the coating is about to be cut through, is a measure for the scratch resistance.

In addition, the loads for reaching the intermediate layers were determined as well.

The clear top coat is hard to discriminate as a separate layer when scratched through. Therefore, the moment the shiny upper layer is scratched through is regarded as the moment the clearcoat is scratched through.

The test results are summarized in table 1.

Table 1, Results of the scratch resistance tests.

Test	First visible scratch	Scratch through clear top coat	Scratch through black midcoat	Scratch through white primer
	Load (N)			
1	8	18	35	58
2	5	22	37	48
3	7	17	38	55
Average of series	7	19	37	54