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English Version

**Road transport and traffic telematics - Electronic fee collection
(EFC) - Ensuring the correct function of EFC equipment installed
behind metallised windshield**

Télématique des transports - Perception électronique des
péages routiers - Fonctionnement des badges en présence
de pare-brise athermiques

Straßenverkehrstelematik - Elektrische Gebührenerhebung
(EFC) - Sicherstellung der korrekten Funktion bei
Installation der On-board-Units hinter metallisch
bedampften Windschutzscheiben

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Foreword

This document CEN/TR 15762:2008 has been prepared by Technical Committee CEN/TC 278 “Road transport and traffic telematics”, the secretariat of which is held by NEN.

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Introduction

European car manufacturers are introducing metallised windscreens at a wide scale throughout Europe. These windscreens have interesting thermal qualities but risk to compromise the correct functioning of On-Board Units (OBUs) for Electronic Fee Collection (EFC) communicating with the roadside.

As it is essential to come to Europe-wide solutions, an ERTICO committee was created in February 1998 to work toward consensus on a common solution. Overall, 25 organisations have actively followed the work of this committee by attending the meetings and/or by contributing by (e-)mail. As a result the committee proposed the use of a non-metallised window as a Europe-wide solution. This solution consists in providing a zone in the windscreen that is free of metal coating. The ERTICO committee produced a document "Ensuring the correct functioning of EFC equipment installed behind metallised windscreens". During the 37th TC 278 meeting CEN/TC 278 adopted the resolution 037/05/2006 to publish this document as a Technical report.

1 Scope

Metallised windscreens are produced by spraying small metal particles on one of the glass or plastic layers of the vehicle's windscreen. This leads to a windscreen with high thermal qualities, ranging from far-reduced power consumption by air-conditioning equipment to short times for de-icing.

The production of certain vehicles in Europe which were equipped with metallised windscreens has created a major problem for the installation and operation of On-Board Units (OBUs) which rely on Dedicated Short-Range Communications (DSRC) for ITS (as the most-widely deployed DSRC ITS application to date, the remainder of this report will refer to Electronic Toll Collection (ETC) but the developed solutions will be valid for all DSRC ITS applications). As is shown in Table 1, windscreen properties have a decisive influence on the transmission of microwave communication and, for metallised windows, it is essential to compensate these losses by special measures (Ref 1).

Table 1 — Transmission losses of safety glass at a frequency of 5.8 GHz (Ref 1)

Glass type	Single-pass transmission losses
glass 3..5 mm	2 .. 4 dB
laminated safety glass 5 mm	2 .. 5 dB
laminated safety glass with heating wire	5 .. 7 dB
laminated safety glass metal-coated 40/11	20 .. 40 dB

As cars equipped with metallised windows are being shipped in large numbers since July 1997, this problem needs to be addressed.

It is important to note that the solution proposed is valid for passenger cars and not for vehicles with near-to-vertical windscreens such as trucks and buses.