

ICS 75.160.20

English Version

Liquid petroleum products - Investigation on internal diesel  
injector sticking deposits mechanisms and the impacts of  
corrosion inhibitors

Flüssige Mineralölerzeugnisse - Untersuchung der  
Mechanismen für die Bildung von Ablagerungen in  
Dieselinjektionsvorrichtungen und der Auswirkung von  
Korrosionsinhibitoren

This Technical Report was approved by CEN on 23 December 2013. It has been drawn up by the Technical Committee CEN/TC 19.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

**CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels**

## Contents

page

Foreword.....	3
1 Scope .....	4
2 Normative references .....	4
3 Symbols and abbreviations .....	4
4 Summary.....	5
5 Description of injector sticking problems.....	5
6 FIEM/OEM experience .....	6
7 Changes influencing internal injector deposits .....	7
8 Deposit forming mechanism .....	7
9 Potential sources of sodium in diesel fuel.....	8
10 Corrosion inhibitors .....	9
11 Investigations in France.....	9
12 Investigations in Spain.....	12
13 Investigations in Denmark .....	14
14 Conclusions .....	15
15 Future work .....	16
Bibliography.....	17

## Foreword

This document (CEN/TR 16680:2014) has been prepared by Technical Committee CEN/TC 19 “Gaseous and liquid fuels, lubricants and related products of petroleum, synthetic and biological origin”, the secretariat of which is held by NEN.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document is a preview generated by EVS

## 1 Scope

This Technical Report describes the investigation into diesel vehicle common rail fuel injector sticking problems in a number of countries across Europe since 2005/2006, carried out by the CEN/TC 19/WG 24/IDID Task Force. It provides conclusions following this work that have been adopted by CEN.

## 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 590, *Automotive fuels - Diesel - Requirements and test methods*

## 3 Symbols and abbreviations

For the purposes of this document, the following symbols and abbreviations apply.

<b>Abbreviation</b>	<b>Meaning</b>
AGQM	Arbeitsgemeinschaft Qualitätsmanagement Biodiesel
ACEA	Association des Constructeurs Européens d'Automobiles (European Automobile Manufacturers' Association)
BNPe	Bureau de Normalization au service des metiers du Petrole
B7	7 % (V/V) blend of biodiesel (FAME) with diesel fuel meeting the requirements of EN 590
B30	30 % (V/V) blend of biodiesel (FAME) with diesel fuel meeting the requirements of EN 590
CEC	Coordinating European Council
CEN	Comité Européen de Normalization (European Committee for Standardization)
CONCAWE	CONservation of Clean Air and Water in Europe
CRC	Coordinating Research Council
DDSA	Dodecenyls Succinic Acid
EN	European Norm
FAME	Fatty Acid Methyl Ester
FIEM	Fuel Injection Equipment Manufacturer
FTIR	Fourier Transform Infra-Red
HDSA	Hexadecenyl Succinic Acid
ICP-AES	Inductively Coupled Plasma Atomic Emission Spectroscopy
ICP-OES	Inductively Coupled Plasma Optical Emission Spectroscopy
ICP-MS	Inductively Coupled Plasma Mass Spectroscopy
IDID	Internal Diesel Injector Deposits
MIL	Malfunction Indicator Light
Na	Sodium
OEM	Original Equipment Manufacturer
SPMR	Societe du Pipeline Mediterranee Rhone
TRAPIL	Societe Des Transports Petroliers Par Pipeline
UFIP	Union Francaise des Industries Petrolieres