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I.S. EN 13631-15:2005

ICS 71.100.30

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EXPLOSIVES FOR CIVIL USES - HIGH EXPLOSIVES - PART 15: CALCULATION OF THERMODYNAMIC PROPERTIES

This Irish Standard was published under the authority of the National Standards Authority of Ireland and comes into effect on:

July 7, 2005

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 13631-15

May 2005

ICS 71.100.30

English version

Explosives for civil uses - High explosives - Part 15: Calculation of thermodynamic properties

Explosifs à usage civil - Explosifs - Partie 15 : Calcul des propriétés thermodynamiques

Explosivstoffe für zivile Zwecke - Sprengstoffe - Teil 15: Berechnung der thermodynamischen Eigenschaften

This European Standard was approved by CEN on 21 March 2005.

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Ref. No. EN 13631-15:2005: E

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Foreword

This document (EN 13631-15:2005) has been prepared by Technical Committee CEN/TC 321 "Explosives for civil uses", the secretariat of which is held by AENOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by November 2005, and conflicting national standards shall be withdrawn at the latest by November 2005.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this document.

This European Standard is one of a series of standards on *Explosives for civil uses– High explosives.* The other parts of this series are:

Part 1: Requirements.

Part 2: Determination of thermal stability of explosives.

Part 3: Determination of sensitiveness to friction of explosives.

Part 4: Determination of sensitiveness to impact of explosives.

Part 5: Determination of resistance to water.

Part 6: Determination of resistance to hydrostatic pressure.

Part 7: Determination of safety and reliability at extreme temperatures.

Part 10: Method for the verification of the means of initiation.

Part 11: Determination of transmission of detonation.

Part 12: Specifications of boosters with different initiating capability.

Part 13: Determination of density.

Part 14: Determination of velocity of detonation.

Part 16: Detection and measurement of toxic gases.

This document includes a Bibliography.

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Introduction

Some properties of the explosives used to define their energetic performance on an *a priori* basis are obtained by means of a thermodynamic calculation. The outcome of such calculation, based on the composition and density of the explosive, is dependent on the detonation state considered, the thermodynamic data used and the calculation method itself.

The simplest thermodynamic calculation of explosives is the one for a constant-volume reaction, usually referred to as constant-volume explosion state. Other calculations such as the Chapman-Jouguet (CJ) detonation state are also commonly used, leading to important dynamic values such as detonation pressure and velocity. However, these calculated values are not meaningful in practice for non-ideal industrial explosives. For this reason, only the simple values of energy and amount of gases produced are considered in this European Standard.

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