

DIN SPEC 91373



ICS 01.040.17; 01.040.27; 17.220.99; 27.200

Comments by 2017-11-22

**Magnetocalorics –
Terminology;
Text in English**Magnetokalorik –
Terminologie;
Text in EnglischMagnétocalorique –
Terminologie;
Texte en anglais

This draft (2017-09-22) is submitted to the public for examination and comment.

As the intended specification may deviate from the present version, the application of this draft shall be subject to agreement.

Comments are requested

- preferably online in the draft standards portal of DIN at www.din.de/go/entwuerfe;
- or as a file by e-mail to info@din.de, preferably in tabular form. The template of this table can be downloaded from www.din.de/go/statements-norm-entwuerfe;
- or in paper form to DIN e. V., Am DIN-Platz, Burggrafenstr. 6, 10787 Berlin.

Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

There are various procedures for developing a DIN SPEC:

This document has been developed in accordance with the PAS procedure.

Document comprises 12 pages

This document has been developed and adopted by the authors named in the foreword.

Contents

	Page
Foreword	3
Introduction.....	4
1 Scope	5
2 Normative references	5
3 Terms and symbols	5
3.1.1 Basic terminology	5
3.1.2 Material properties.....	7
3.2 Symbols	10
Annex A (informative) Example of a ΔT-curve for a typical magnetocaloric material	11
Bibliography	12

Foreword

This DIN SPEC has been developed according to the PAS procedure. The development of a DIN SPEC according to the PAS procedure is carried out in workshops and does not require the involvement of all stakeholders.

This document has been developed and adopted by the initiator(s) and authors named below:

- Technische Universität Darmstadt, Functional Materials
Prof. Oliver Gutfleisch, Dimitri Benke, Maximilian Fries, Andreas Taubel
- Technical University of Denmark
Dr. Christian Bahl
- Vacuumschmelze GmbH & Co. KG
Dr. Alexander Barcza
- BSH Hausgeräte GmbH
Dr. Irene Dumkow
- Fraunhofer Institute for Ceramic Technologies and Systems IKTS
Christian Molin
- MoveOnn Inside
Timothy Lorkin
- Camfridge Ltd
Dr. Alessandro Pastore
- Astronautics Corporation of America
Dr. Steven L. Russek

At present there are no standards covering this topic.

DIN SPECs are not part of the body of German Standards.

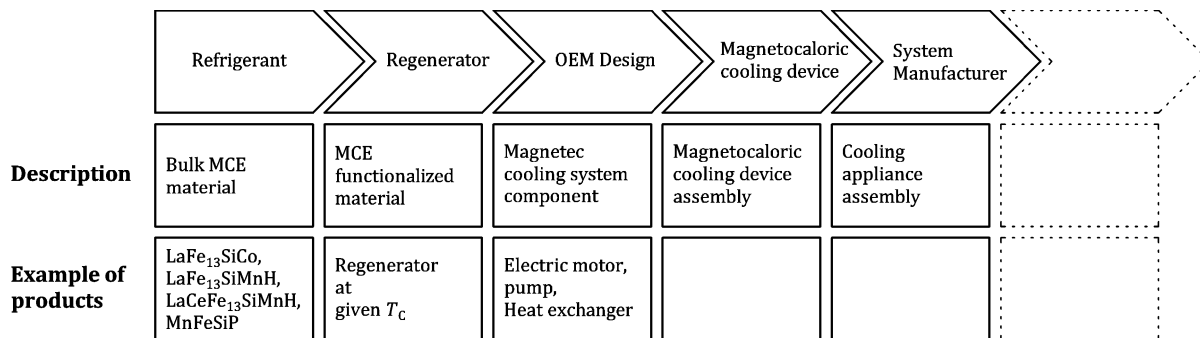
Despite great efforts to ensure the accuracy, reliability and precision of technical and non-technical information, the Workshop cannot give any explicit or implicit assurance or warranty in respect of the accuracy of the document. Users of this document are hereby made aware that the Workshop cannot be held liable for any damage or loss. The application of this DIN SPEC does not release users from the responsibility for their own actions and is applied at their own risk.

Introduction

At the end of the 1990s beginning of 2000s the discovery of new magnetocaloric materials with the potential to be low cost by virtue of avoiding expensive or rare elements, led to a significant expansion of materials research in universities and research centres. The possibility to exploit these new materials, coupled with the emergence of the large-scale production of high-performance and low-cost permanent magnets, led to the formation of new companies aiming at creating new technologies that exploit the properties of magnetocalorics. Concurrently, metallurgy and chemical companies started to invest in R&D activities aimed at using their internal industrially scalable processes to mass produce these new materials.

An international community of developers and researchers from both academia and industry has coalesced, with a huge expansion over the last decade of scientific publications and conferences covering the field of magnetocalorics.

Emerging from these developments a magnetic cooling industry value chain is now taking shape. An illustration of such a value chain is shown in Figure 1. [1].



[1] SOURCE: N. Wilson, A. Pastore, “Challenges and Opportunities for Introducing Magnetic Cooling Technology to Market”, chapter 13 of the book “Magnetic cooling: from fundamentals to high efficiency refrigeration”, edited by: K.G. Sandeman and O. Gutfleisch, John Wiley & Sons, 2017.

Figure 1 — Nascent magnetic cooling industry value chain — courtesy of the authors [1]

This nascent industry can grow faster and stronger if industrial standards are defined and accepted by the different players along the value chain. A unified terminology represents the first step towards the creation of such standards.