

EN 12440: A NECESSARY REVIEW OF THE DENOMINATION CRITERIA STANDARD TO ELEVATE EU NATURAL STONE IN A DIGITAL AND SUSTAINABLE MARKET

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Summary: *The European standard EN 12440, which regulates the denomination of natural stones, is a vital strategic asset for the industry's competitiveness. However, its effectiveness has long been compromised by ambiguous criteria and a slow revision process. As the new Construction Products Regulation (CPR) and the introduction of Digital Product Passports (DPPs) make traceability and transparency mandatory, the shortcomings of the standard have become a critical liability. This paper presents a detailed analysis of EN 12440's deficiencies and, drawing on the work of a multidisciplinary technical group, outlines concrete proposals for its modernisation. The aim is to transform the standard into a robust and dynamic tool, enabling the natural stone sector to meet future regulatory, digital, and sustainability requirements.*

Key words: *Natural Stones, European Standard, EN 12440, Denomination Criteria, Digital Database, Traceability, Market Competitiveness.*

1. Introduction: The Denomination Challenge and the Need for an Updated Standard

The harmonisation of technical standards is a cornerstone of the European Union (EU), shaping its influence across materials, processes, products, and services. The denomination of natural stones is a key example where harmonisation criteria are essential, particularly for promoting market confidence and ensuring alignment with the new Construction Products Regulation (CPR) (EPC, 2024).

In 1999, to address the prevailing confusion surrounding the designa-

tion of natural stones, the CEN/TC 246 Working Group on Terminology, Classification and Characteristics initiated the development of a standard. The aim was to establish a comprehensive framework for the denomination of natural stones, offering a reference to navigate the multitude of commercial names emerging from market trends and promotional efforts. The standard also aimed to provide lists of natural stones for each EU Member State, based on established criteria.

The first version, 'EN 12440 Natural Stones—Denomination criteria', was published in 2000. However, its criteria were outlined in a subjective and overly concise manner, resulting in inconsistent interpretations and a lack of harmonisation in the national lists included in the annex. The standard has since undergone two revisions, with a third currently under consideration. A deadlock persists between Member States supporting a new revision and those favouring the retention of the current version.

This paper presents a detailed analysis of the EN 12440 standard, focusing on its 2017 version currently valid, in order to highlight its deficiencies and the pressing need for revision. It also offers concrete proposals for improving the denomination criteria, with the aim of enabling the standard to fully achieve its original purpose: to effectively harmonise the denomination of natural stones across the EU.

2. Methodological Approach

A systematic analysis was carried out on all published versions of the EN 12440 standard (2000, 2008, and 2017) to assess the evolution of

its content and criteria. The primary focus of this study was the 2017 version currently valid, with a particular emphasis on Annex A, which contains the official denomination lists submitted by each Member State (Fig. 1). To evaluate the effectiveness of the standard and its alignment with market realities, the following steps were undertaken:

- The completeness of the national lists was verified by checking whether all EU Member States had submitted their contributions and by quantifying the number of natural stone varieties in each list.
- Inconsistencies within the submitted data were identified, including repeated varieties, the use of identical commercial names for different varieties, and the omission of key denomination criteria (e.g., typical colour, petrological family, and place of origin).
- As 11 of the 34 EU Member States had not submitted their lists, a comparative analysis was carried out using two prominent digital databases to highlight the standard's relevance in the

current global market. The selected databases were chosen based on their extensive commercial entries, market relevance, regular updates, and open-access availability, as is:

- Naturstein (naturalstone-online.com/stones): A German-based global archive containing over 4,500 natural stone entries, with descriptions closely aligned with the EN 12440 criteria.
- Stone Contact (stonecontact.com): A global e-commerce platform featuring a catalogue of over 23,500 entries, classified by petrographic groups, colours, and countries.

A statistical chart was produced to visualise the disparity in natural stone entries between the EN 12440 Annex A lists and the data from these two online databases. The histogram illustrates each country's significance as a European stone producer and its visibility in the global market, a relevance further supported by external sectoral statistics (Montani, 2023; ASSIMAGRA, 2025).

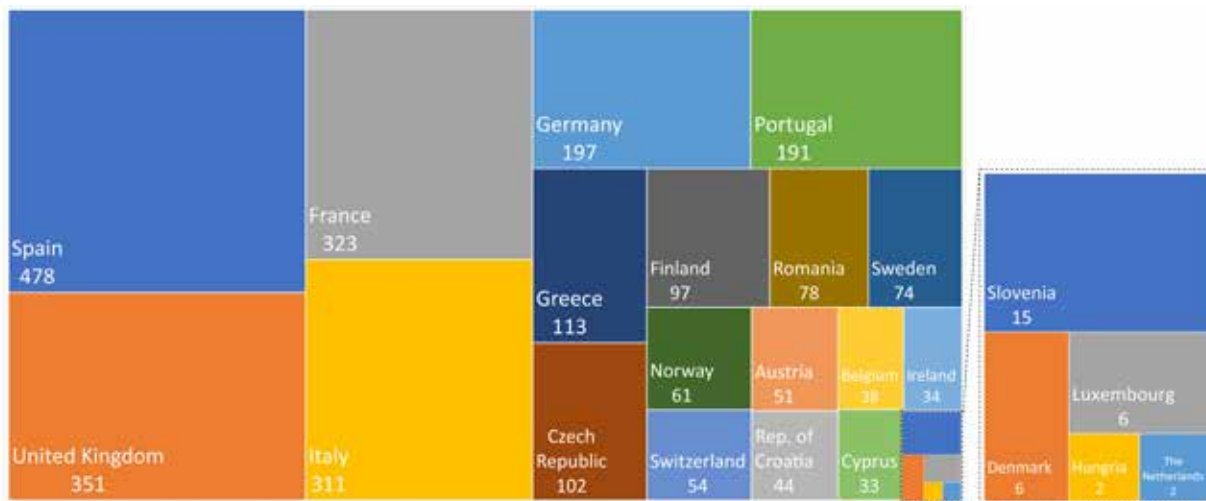


Figure 1 - Number of natural stone varieties (entries) reported by EU Member States in their non-exhaustive lists, as published in Annex A of EN12440:2017. Source: Communication to the 8th Global Stone Congress, Drama, Greece, 16-20 June 2025

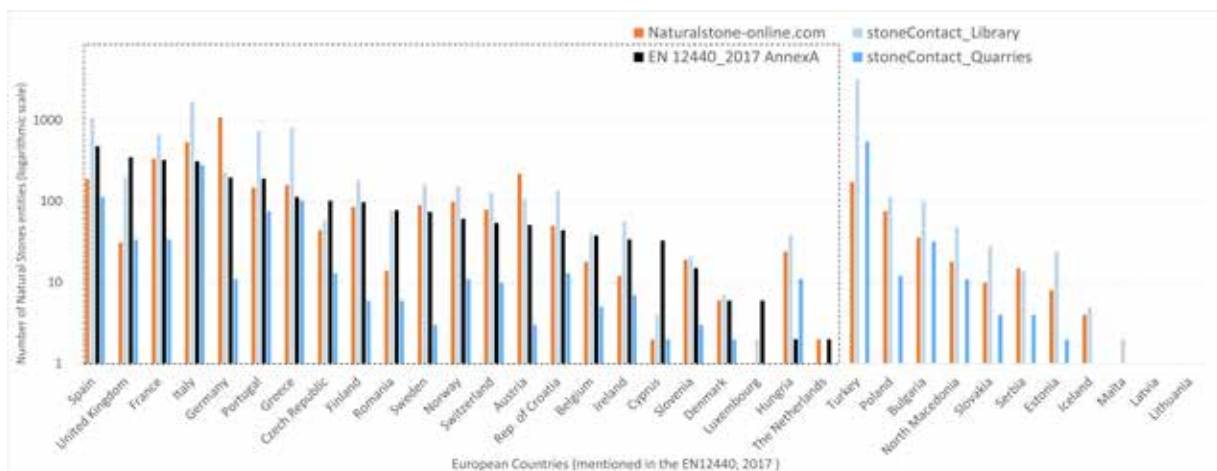


Figure 2 - Number of distinct natural stone varieties (entries) from each EU Member State, listed in two different reference digital databases, compared with the lists included in Annex A of EN12440:2017 (the dotted frame highlights the countries lists in Annex A).. Source: Communication to the 8th Global Stone Congress, Drama, Greece, 16-20 June 2025."

3. Results and Discussion

An analysis of the EN 12440 standard reveals several critical issues that undermine its effectiveness and relevance. The first issue concerns the slow pace of its revision cycle. Since its initial publication in 2000, the standard has undergone only two revisions, with substantial intervals between the 2008 and 2017 versions. This revision cadence fails to keep pace with the highly dynamic natural stone market, where new varieties are constantly introduced and others become obsolete, necessitating regular updates to remain up to date.

Furthermore, a comparative analysis across the 2000, 2008, and 2017 versions shows that while the national lists of natural stones were updated, the underlying denomination criteria have remained largely unchanged. These criteria were defined in an overly concise and subjective manner, leading to varied interpretations and a lack of harmonisation. This vagueness has resulted in widespread non-compliance by companies presenting natural stone denominations in commercial documents, including mandatory Declarations of Performance (DoP), which in turn have prompted stakeholders to question the standard's utility and even advocate for its withdrawal.

A detailed analysis of the national lists in Annex A reveals significant inconsistencies. The data indicate a marked disparity in the number of natural stone varieties presented by each country, with several EU Member States of global significance entirely absent from the lists. The study identified numerous non-conformities, including:

- Repeated varieties: 120 instances of the same variety, sometimes with identical commercial names, were identified across the 23 submitted lists.
- Inconsistent naming: 53 cases were identified where the same commercial name was applied to petrologically and/or chromatically distinct varieties.
- Omission of criteria: Essential denomination criteria were either systematically or casually omitted. For example, the petrological family were absent in 8 of 441 distinct classes. The place of origin was absent in 14 cases out of 2,100 listed locations, which included 416 quarries. Most notably, the typical colour was not specified in 135 of the 928 unique colour designations.

These non-conformities underscore the urgent need for a clearer and more objective definition of the denomination criteria, to ensure the standard can effectively achieve its intended purpose of harmonisation.

4. Improvement proposals

Building upon the critical analysis of the current standard, the following proposals for revision are presented to address the identified non-conformities and strategically position the EN 12440 as a robust instrument aligned with the requirements of the new Construction Products Regulation. The proposed changes aim to enhance objectivity, consistency, and usability, thereby strengthening transparency and competitiveness within the natural stone industry.

1. **Protection of Commercial Names:** The standard should include a disclaimer in its European foreword to protect CEN and national standardisation bodies from legal claims arising from the use of registered trademarks as natural stone commercial names.
2. **Uniform Terminology:** A unified terminology must be established and consistently applied throughout the standard, from the Introduction to Annex A, to eliminate ambiguity and promote a single, objective interpretation of denomination criteria.
3. **Inclusion of a "Terms and Definitions" Clause:** A new, dedicated clause should be introduced to provide clear and objective definitions for "natural stone" and all denomination criteria, serving as a definitive reference for industry stakeholders.
4. **Alternative Names:** The "Name of the natural stone" clause should be expanded to allow the inclusion of alternative commercial names, acknowledging the market realities of diverse branding and marketing strategies, both domestically and internationally.
5. **Standardised Petrological Classification:** The "Family/petrological group" subclause must require classification to be carried out strictly in accordance with EN 12670 and its Annex A, replacing the current proliferation of non-standardised designations.
6. **Objective Colour Designation:** The "Typical colour" subclause should be revised to mandate standardised observation conditions, including surface finishing. Furthermore, colour descriptions must be assigned using a normalised reference system, such as that established by the Eurolithos project, thereby eliminating vague, subjective, and excessively numerous colour names.
7. **Precise Place of Origin:** The "Place of origin" subclause should specify that the geographic name of the quarrying site must be provided, followed by up to three administrative territory divisions, with the country listed last. The inclusion of geographic coordinates (EPSG 4326) of the quarry centre should be mandatory, thereby avoiding references to specific companies or imprecise areas and supporting the traceability requirements of the DPP.
8. **Digital and Structured Annex A:** The lists in Annex A should be restructured as a digital, online, and editable table. Each row should represent a single variety, with columns dedicated to each denomination criterion. This format would enable Member States to upload their updated lists during revision cycles, ensuring the content remains current and accessible.
9. **Regular Revision Cycles:** The review cycle for Annex A should be set at a consistent four-year interval. This regular update schedule would align the standard with the natural dynamism of the market, ensuring that listings reflect the discovery of new stones and their commercial circulation.
10. **Linguistic Consistency:** In the English version of the standard, all technical terms (excluding natural stone and place names) should be presented in English, including petrological family names and colours, to ensure consistent and clear communication across all EU markets.

5. Conclusions

The analysis presented in this study demonstrates that, although the EN 12440 standard was developed with the aim of harmonising natural stone denomination, its full potential has been constrained by a lack of clarity in its criteria and a slow, inconsistent revision process. The national lists of stones provided in Annex A, while conceptually foundational, suffer from significant data disparities and non-conformities, thereby undermining the standard's authority as a reliable reference for the European market.

A key challenge for the natural stone industry is navigating the new wave of EU regulations, including the New Construction Products Regulation (CPR), the EU Taxonomy, and the forthcoming Digital Product Passports (DPPs). These directives place a strong emphasis on traceability, sustainability, and transparency. As competing construction materials, such as engineered and agglomerated stones, actively revise their own standards to meet these new imperatives, it is imperative that the natural stone sector does likewise.

The revision proposals outlined in this paper are not merely technical adjustments; they represent a strategic response to these emerging challenges. By implementing a consistent, objective, and transparent denomination framework, a modernised EN 12440 would become a key enabler for the natural stone industry. It would provide the foundational data required for the development of Digital Product Passports, facilitate compliance with environmental reporting obligations (EN 15804), and support the principles of the circular economy by providing clear, standardized information for the reuse and recycling of stone products.

In essence, a revised EN 12440 would transcend its traditional role, evolving from a static document into a dynamic, digital tool. This strategic alignment would not only resolve internal inconsistencies but also empower the EU natural stone sector to assert its authenticity, traceability, and inherent sustainability, reinforcing its competitive position in a market increasingly shaped by digital and environmental performance metrics.

For further insights into these topics, we invite you to listen to the podcast "**Natural Stone: Elevating Identity in a Digital World, AI powered by NotebookLM**". It is accessible via QR code or through the following link: <https://youtu.be/MD3PY5u-ulw?si=ffdyCQWPBhjCv5sf>.



Acknowledgments:

We would like to express our gratitude to the working group IPQ/CT 118 – Rochas Ornamentais (IPQ – Portuguese Institute for Quality), which serves as the national mirror committee to CEN/TC 246 – Nat-

ural Stones (CEN – European Committee for Standardisation), and to both technical committees for their valuable contributions.

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