



Calcite

*The purpose of this factsheet is to provide an overview of the mineral **calcite**. It forms part of a series on economically-important industrial minerals, excluding aggregates, that are extracted in England. It is primarily intended to inform the land-use planning process.*

Long Rake calcite Mine, Peak District. A former source of vein calcite.

Calcite, calcium carbonate (CaCO_3), is a common rock-forming mineral. It is the principal constituent of all limestones, including chalk, which largely consist of the fossil remains of marine organisms. Limestones are worked on a large scale and are important sources of aggregates, cement raw materials, lime (CaO), and material for a range of industrial and agricultural uses. Some limestones, particularly chalk, are valued for their high whiteness and are used for a range of filler applications. Limestone and chalk for non-aggregate applications are considered in more detail in the factsheets on **Cement Raw Materials** and **Industrial Limestone**.

Crystalline calcite, which is the focus of this factsheet, is a common component of many mineral veins. It is associated with those veins carrying fluor spar-baryte-lead mineralisation

that occur in limestones of Carboniferous age, particularly those in the Peak District of Derbyshire. Where these minerals are worked, the calcite is treated as waste. However, in some veins, calcite is present almost to the exclusion of all other minerals. These have been exploited in their own right to form a small extractive industry quite separate from the large-scale extraction and use of limestone and also quite distinct from the extraction of fluor spar with associated barytes and galena.

Demand

Vein calcite, or calc spar and 'Derbyshire Spar' as it is locally known in the Peak District, has its own distinctive character and supplies a small niche decorative market throughout the UK. The calcite has an off-white/cream colour. A distinctive feature is its sparkling surface produced by reflections on the cleavage surfaces of the coarsely crystalline calcite. Vein calcite is used principally as a decorative mineral aggregate in a range of applications, including incorporation into reconstituted stone, exposed concrete panels, dry dashed building finishes, loose and bitumen-bonded path/drive surfacing, in terrazzo tiles and as reflective finishes for flat roofs.

Supply

Workable deposits of vein calcite have a restricted distribution in England. The Peak District has traditionally been the most important source, with production starting in the mid-19th century. The area has been the sole source of supply since the 1980s. Outside the Peak District, calcite has been recovered from waste heaps from former lead mining operations at Snailbeach in Shropshire and from small mines working calcite veins in the Halkyn Mountains of North Wales. The last mine in North Wales closed in 1982.

Production data are incomplete, because of the limited scale of the industry. However, output has typically been a few thousand tonnes a year and has not exceeded 15 000 tonnes in recent years.



Mineral Planning Factsheet

Calcite

Trade

Calcite, mainly in the form of marble, is imported into the UK, both for decorative aggregate purposes and as a source of high whiteness filler, for example, for use in papermaking. In 2002 imports were about 254 000 tonnes valued at £4.9 million.

Consumption and economic value

As records of production are incomplete and imports are of forms of calcite with somewhat different properties, it is likely that consumption is essentially the same as production being a few thousand tonnes a year. The value of production is small and the total turnover of the industry is unlikely to exceed £0.5 million a year.

Structure of the industry

There are two main suppliers of vein calcite in England, Long Rake Spar Company Ltd and Derbyshire Aggregates Ltd. Both companies have processing plants located to the west of Youlgreave on the sites of former lead mines, which subsequently were worked for calcite. The last mine closed in 1981. In both concerns the supply of locally produced calcite forms only a part of their business, which includes the supply of a wide range of decorative aggregates. The Long Rake Spar Company Ltd operates surface workings to supply its calcite requirements whilst Derbyshire Aggregates is supplied by Moss Rake Calcite Works with surface workings on Moss Rake, near Bradwell.

Resources

Calcite is a common mineral occurring in many mineral veins but was treated as waste in former metal mining operations. Only rarely does it occur in sufficient concentrations to be economically viable. Resources are confined to the Southern Pennine Orefield in the Peak District where steeply inclined, generally E-W trending fissure veins ('rakes') occur in limestones of Carboniferous age. There is a distinct mineral zoning within the veins with fluorspar being dominant in most veins in the eastern part of the orefield, and barytes and calcite becoming

more dominant westward. In some veins calcite occurs almost to the exclusion of all other minerals. The calcite veins may be up to several metres wide. Dirtlow Rake, near Castleton and Moss Rake, near Bradwell have been the principal sources of supply for many years.

Reserves

Permitted reserves of calcite are not quantified but considered to be small. Some calcite extraction is from unpermitted operations in the Peak District National Park.

Relationship to environmental designations

The calcite-bearing veins of current economic interest are confined to the Peak District National Park.

Extraction and processing

Calcite was formerly extracted by underground mining but the last mines in the Peak District (Long Rake Mine) and in North Wales closed in the early 1980s because of the high cost of this method of extraction. Since then production has been by surface working of mineral veins. The vertical and narrow nature of the veins has meant that at some sites there have been safety concerns about extraction from a narrow and deep trench. As a result removal of the host limestone forming the wall rocks to the vein has taken place at some sites. The limestone has been sold as construction aggregate and concerns have been raised about the ratio of calcite to limestone from such operations. Consequently limestone has been produced in much larger quantities than calcite, raising the issue of what is the primary product.

Calcite processing consists of crushing, washing and screening to produce different size fractions from 12 mm down. Some finer sizes are dried and bagged.

By-products

Limestone, forming the wall rocks to a calcite vein, may be a significant by-product of calcite extraction. This is considered to be undesirable as there are already large permitted reserves of

Calcite



Calcite

limestone within the Peak District National Park and any limestone from the extraction site should be used for site restoration. Where any associated fluorspar mineralisation is present, the ore may be sold to the Cavendish Mill, near Stoney Middleton, for processing to recover fluorspar (see Fluorspar Factsheet).

Planning issues

Calcite resources of current economic interest are found exclusively in veins that cut Carboniferous limestones in the Peak District National Park. This limestone forms attractive scenery with considerable ecological significance and amenity value. The industry, therefore, operates in a highly sensitive area.

Surface working of calcite, especially to significant depths, also raises issues of the surface storage of limestone wall rock and its sale, sometimes in large quantities, for construction use. There is, therefore, an important issue concerning the ratio of calcite to limestone that will be produced from a given site, and their relative economic value. In addition, calcite working is located in areas where limestone extraction would not normally be permitted. There are already large permitted reserves of limestone in the Peak District National Park, and additional reserves are not required.

Some calcite operations have been worked over long periods and restoration has been inadequate.

Authorship and acknowledgements

This factsheet was produced by the British Geological Survey for the Office of the Deputy Prime Minister to support the research project 'Review of Planning Issues Relevant to Some Non-Energy Minerals other than Aggregates, in England' (2004).

It was compiled by David Highley, Andrew Bloodworth (British Geological Survey) and Richard Bate (Green Balance Planning and Environmental Services), with the assistance of Don Cameron, Fiona McEvoy and Deborah Rayner.

The invaluable advice and assistance of the minerals industry in the preparation of this factsheet is gratefully acknowledged.

Mineral Planning Factsheets for a range of other minerals produced in England are available for download from www.mineralsUK.com

© Crown Copyright 2004.

Unless otherwise stated all illustrations and photos used in this factsheet are BGS©NERC. All rights reserved.

Calcite