

# CONCRETE

## WITH EXPANDABLE MICROSPHERES

Make high quality freeze-thaw resistant concrete



### OVERVIEW

#### Product Type

Expanded microspheres

#### Main Benefits

Lower carbon dioxide emissions  
Use of less cement

#### Applications

Freeze-thaw resistant concrete

## Expandable Microspheres

Expandable microspheres with an **elastic** and **resilient** polymer shell are small, 40 µm, with a narrow particle size distribution.

The microspheres can be used to replace **air entrainment** in freeze-thaw resistant concrete.

This technology can provide a **sustainable** solution for **high quality** concrete, offering **lower carbon dioxide** emissions with use of **less cement**.



## Improving Quality & Strength

**Replacing air extrainment** technology with expanded microspheres in the production of freeze-thaw resistant concrete will **improve quality** and **strength**.

It is possible to **reduce pore concentration** below 1% v/v.

This allows higher quality freeze-thaw resistant concrete to be produced with **greater consistency** and with **less cement** in the formulation.

The flexibility of expandable microspheres means they can **withstand mixing** and **shotcrete** processes. The spheres can remain **flexible** at very **low temperatures**, as low as  $-30^{\circ}\text{C}$ .

With a lower addition of voids,  $\leq 1.5\%$  v/v, less cement can be used in concrete, which gives **a huge positive environmental impact**.

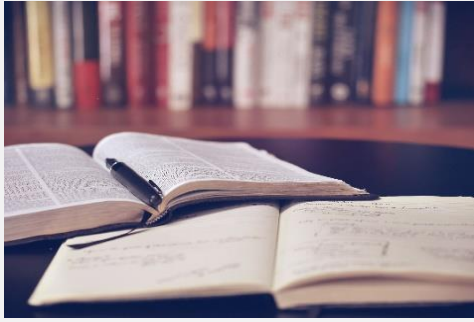
# Durability

Performance at extreme temperatures



**Wet expanded** microspheres, with a particle size of **40  $\mu\text{m}$** , are the most suitable type of expandable microspheres for freeze-thaw resistant concrete.

**Durability** tests have shown concrete containing expandable microspheres to withstand average winter temperatures of  **$-5$  to  $-14^{\circ}\text{C}$**  and average summer temperatures of **greater than  $20^{\circ}\text{C}$** , over a period of 5 years.



## Further Reading

Our **Technical Guide – Expandable Microspheres** takes an in depth look at the properties of expandable microspheres. A great introduction if you are new to the world of expandable microspheres.

Our **Application Guide – Crack Filler with Expandable Microspheres** shows you a different way in which the microspheres can be used in construction applications.

If your preference is to use dry expanded microspheres, for guidance on handling and mixing take a look at our **Technical Guide – Handling Expandable Microspheres**.

## What's Next?



Do you need help **choosing the right grade** for your application, **more information** or a **sample** to try?

We are always happy to help and answer any questions you may have. Please do not hesitate to contact us:

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### Something to Note

The information contained in this guide is a result of our experience and research. It is given in good faith but under no circumstances does it constitute a guarantee on our part, nor does it hold us responsible, particularly in the case of legal action by a third party.