

# Ferrite for Science and Industry

# Specialty Ferrites for

## *Ferrite Cores for Science and Industry*

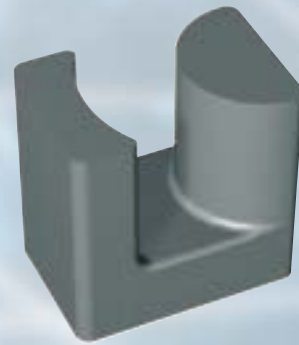
Ferrites are used not only in the known consumer and professional electronics applications, but also in science and industry. The specifications and tolerances required for scientific and industrial applications are generally very demanding and critical. Experts in ceramic technologies know that making ferrite is one thing, machining it to close tolerances is another.

Hence there are only a few ferrite manufacturers in the world who can deliver ferrites with the required magnetic properties and within critical tolerances.

FERROXCUBE is one of those few manufacturers but with a difference. We bring along with us the experience gained by supplying customized products to some of the most prestigious scientific institutions and industries.

This means we can support you in finding the best solution for any inductive component you may need. Especially if your requirements cannot be met with ferrite cores from our standard ranges, the Advanced Design Center is at your service to make the necessary design calculations, machine first prototypes from solid blocks, or press and sinter small series using "quick tools".

Being a major worldwide supplier of a wide variety of Soft Ferrites gives us the experience and know-how to support such projects.





# Science and Industry

## Contact us to find out

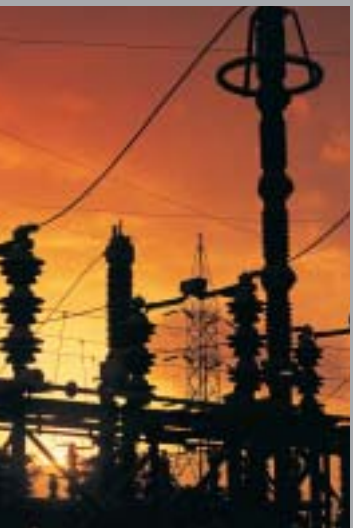
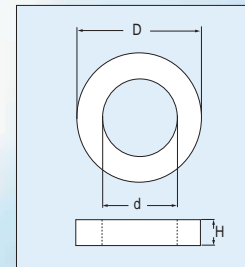
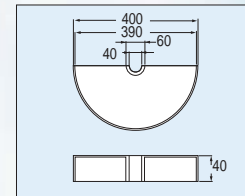
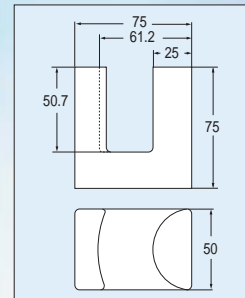
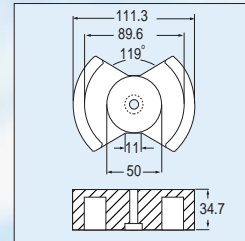
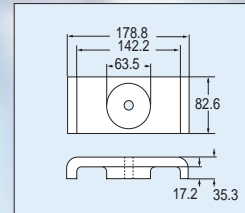
The space available in this brochure does not permit us to cover all, or even a fair number, of our ferrite applications.

So we limit ourselves to show our product capabilities in some major scientific and industrial applications.

These examples may, perhaps, trigger a thought, a possible new approach in a design process.

For further enquiries about documentation, technical details, application support and other commercial matters, please contact our sales office in your area or a franchised distributor.

For their addresses see the back of this folder or, even better, our web-site at [www.ferroxcube.com](http://www.ferroxcube.com).



# Science and Industry

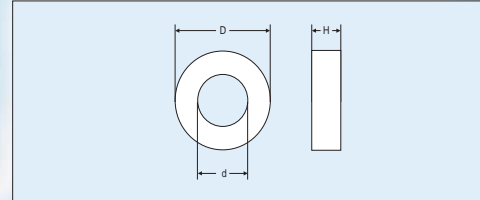
## Ferrite Cores for Scientific Particle Accelerators

Ferrites are used extensively in modern scientific experiments. One of the most exciting and advanced applications is in particle accelerators. Scientists are trying to discover the mysteries of the universe by smashing atomic particles with titanic forces. This requires particle beams to be accelerated to very high speeds and guided into a collision chamber with the help of specially designed ferrite toroids and kicker magnets.

Our research and development laboratories located in Eindhoven, The Netherlands, can build on 50 years' experience in ferrite technology. We developed the required material grades which fulfil the demanding specifications. Due to our long involvement with ferrite technology, we are one of only two major suppliers in the world who support such demanding projects. Because of the extremely critical nature of the specifications, these ferrite toroids and blocks are designed and developed in close interaction with the scientists.

This has enabled us to develop unique materials, which are processed in our highly controlled production environment to deliver the required product performance.

Our range of large toroids and blocks is developed especially for use in scientific particle accelerators. Applications include kicker magnets and acceleration stations. Dynamic behaviour under pulse conditions is important for both applications. So special ferrite grades are optimized for low losses at high flux densities. These large toroids have also been used successfully in delay lines for very high powers such as in pulsed lasers or radar equipment. Other sizes than those mentioned in the tables can be made on request.



| type number | D             | d              | H             | mass (g) |
|-------------|---------------|----------------|---------------|----------|
| T76/38/13   | 76.2<br>± 0.1 | 38.1<br>± 0.1  | 12.7<br>± 0.1 | ≈ 220    |
| T170/110/20 | 170<br>± 0.2  | 110.2<br>± 0.2 | 20<br>± 0.2   | ≈ 1300   |
| T240/160/20 | 240<br>± 0.3  | 160<br>± 0.3   | 20<br>± 0.3   | ≈ 2500   |
| T498/270/25 | 498<br>± 0.1  | 270<br>± 0.2   | 25<br>± 0.2   | ≈ 17 000 |
| T498/300/25 | 498<br>± 0.1  | 300<br>± 0.2   | 25<br>± 0.2   | ≈ 15 000 |
| T500/240/25 | 500<br>± 2    | 240<br>± 0.2   | 25<br>± 0.2   | ≈ 19 000 |
| T500/300/25 | 500<br>± 0.1  | 300<br>± 0.1   | 25<br>± 0.1   | ≈ 16 000 |
| core type   | 4M2           | 4B3            | 8C11          | 8C12     |
| T76/38/13   | ♦             |                | ♦             | ♦        |
| T170/110/20 |               |                | ♦             |          |
| T240/160/20 |               |                | ♦             |          |
| T498/270/25 |               |                |               | ♦        |
| T498/300/25 |               |                |               | ♦        |
| T500/240/25 |               | ♦              |               |          |
| T500/300/25 | ♦             |                |               |          |





## *Ferrites and Electro Magnetic Compatability*

FERROXCUBE manufactures an extensive standard range of EMI-suppression ferrites. Products vary from tiny multilayer beads to large toroids in a variety of materials.

In most applications these standard products will cover your requirements, and are of course the most economical solution. However, in some cases requirements can be so extreme that they go beyond this range.

Examples are very high currents or precise dimensions to fit the application. Then the Specialty Ferrites group comes to the rescue by pressing and sintering the huge toroids required or by machining the parts from solid blocks to microns precision.

Applications range from tiny platelets to shield certain ICs to ferrite cable gutters to solve persistent radiation problems. Another, rather extreme, example are huge "suppression beads" around the shaft of an electricity generating windmill to avoid damage from lightning. The current was delayed long enough to start the spark bridge to the lightning discharge conductor, thus avoiding damage to the mill's expensive ball bearings.

