

# Borates' Health & Safety Effects

The earth consists of trace amounts of more than 200 minerals that contain boron. Every member of the plant world relies on boron to grow. Naturally, boron is also part of a healthy diet for people. Boron – or industrial minerals called borates – can be found in thousands of products and processes that make modern life livable. But even a good thing – like this naturally-occurring, nutritionally-important element – can be harmful if it's intentionally abused. Here are some commonly asked questions and answers about boron and its impact on health and safety.

## **Q: Are borates safe?**

**A:** Borates have an excellent reputation for safety. In trace amounts, they're essential micronutrients for plants and believed to be nutritionally important for people. In extreme doses, they can make you ill. As perspective, borates are about as acutely toxic as table salt.

The United States Food and Nutrition Board (FNB) recently recognized the safety of boron by establishing a Tolerable Upper Intake Level (UL) for boron of 20 milligrams per day.

## **Q: How can they be safe and unsafe at the same time?**

**A:** Like many trace elements, borates are both essential at low concentrations and toxic at high concentrations. Borates are considered safe because it's extremely unlikely that people would ever be exposed to the levels necessary to reach toxicity. While hazard is associated with high doses of borates over a long period of time, there are biological reasons that make it almost impossible for people to be exposed to high enough concentrations of borates in their daily lives to harm their health.

## **Q: What do animal studies show?**

**A:** Scientists conduct studies to determine both the level at which boron is harmful, and the level at which boron is beneficial to health. Animals forced to ingest high doses of borates over long periods of time have shown adverse developmental and reproductive effects. In studies where boron is completely removed from the diet and environment, the same adverse effects occur. In other words, too much boron is as bad as too little.

## **Q: What would happen if you accidentally ingested very high dose of borates?**

**A:** An extremely high intake of borates would make most people vomit. But it's highly unlikely that you would be exposed to such quantities through eating foods or using products that contain borates. We've been mining and refining borates for more than 130 years. Evaluation of our workers – who receive higher borate

exposures than most people – have shown none of the adverse health effects reported in animal studies. In most cases where people have experienced artificially high borate intake, vomiting or excretion in urine has been rapid, and blood and tissue concentrations were shortly back to normal.

**Q: How do our bodies absorb borates?**

**A:** When people eat plant-based food, they absorb small amounts of boron. Studies indicate that people in a wide variety of cultures consume about one to three milligrams of boron per day through a combination of foods and beverages. There is almost universal agreement in the scientific community – including the World Health Organization – that boron is nutritionally important to maintain optimal human health.

**Q: How do our bodies get rid of boron?**

**A:** It's important to note that boron does not accumulate in the body. In fact, regardless of the source of boron exposure, once it is ingested or inhaled, our bodies use what is needed and excrete the rest.

**Q: What does boron do to keep you healthy?**

**A:** While researchers are still determining the exact role that boron plays in maintaining and promoting health, its importance in energy metabolism, bone health and strength, and brain function has been established.

**Q: What have you done to protect people from possible risk?**

**A:** Borax operations around the world comply with all applicable safety regulations and make safety training a priority. Our practices and products are in good standing in the nearly 100 countries in which we do business. We're confident that our employees and our customers' employees have adequate information and training to handle borates safely, and we don't sell products for any uses that we cannot demonstrate are safe for consumers.

We're also committed to communicating what we know about the health, safety and environmental impacts of borates as widely as possible. We produce Material Safety Data Sheets (MSDS) on all our products that clearly outline safe use and handling practices. These MSDS are given to our customers, available to the public, and on file with regulatory agencies around the world. Borax also sponsors studies, symposia and research in order to share information about borates' health effects as widely as possible.

**Q: What do government organizations have to say about boron?**

**A:** Most major risk assessment organizations around the world have studied boron – including the World Health Organization, the United States Environmental Protection Agency, the European Union and the National Academy of Sciences – and most are satisfied that standing regulations are more than adequate to protect people, animals and the environment. In fact, most regulatory bodies are focusing their energies on determining how much boron people need each day to stay healthy.

The European Union is considering the issue of classifying borates and requiring that products containing borates be labeled accordingly in the coming year. As world leaders in information about borate technology, health and safety issues, we are cooperating with EU leaders and making our information and experience available to them.

**Q: Does it make sense to regulate the use of borates even more?**

**A:** No, not when you consider the facts about how people are exposed to borates and in what amounts. Borate products have been used safely for more than 100 years and we believe that more stringent regulations would alarm people for no good reason. There are also no good substitutes for many of the products that now rely on borates. As world leaders in borates, we're obligated to raise these points in the appropriate manner and forum – on our behalf, our customers' and on behalf of the consumers who need borate-based products and eat foods containing borates.

**For more information, contact the Product Safety Department:**

Tracy Branch (N. America/S. America)

Email: [tracy.branch@borax.com](mailto:tracy.branch@borax.com)

Tel: (1) 661 287 5435

Fax: (1) 661 287 5542

Keith Shettle (Asia)

Email: [keith.shettle@borax.com](mailto:keith.shettle@borax.com)

Tel: (44) 1483 242072

Fax: (44) 1483 242172

Sue Hubbard (Europe)

Email: [sue.hubbard@borax.com](mailto:sue.hubbard@borax.com)

Tel: (44) 1244 303226

Fax: (44) 1244 303227