

# TOTAL BORON

**Ingredients:** Each tablet includes: Vitamin B-6 15 mg, Pyridoxal-5-Phosphate 2 mg, Boron (as aspartate) 3 mg, Apple Pectin 100 mg, Asparagus (herb) 100 mg.

**Supportive Function:** Boron is a trace mineral essential for healthy bone and joint function; it helps to build strong bone tissue. Boron also facilitates the detoxification process.

**When is Total Boron helpful?** Osteoporosis, bone injury, metal or other detoxification

**Clinical Applications/Research: Vitamin B6 (15mg)** has been reported to help remove lead from the brain (Balch & Balch, 1997:364). The B vitamins, especially B6, has been reported to be important in helping rid the intestinal tract of excess metals, removing them from the body, and protecting the cells and the brain: identified heavy metals include aluminum and mercury (Balch & Balch, 1997: 123, 386, The Burton Goldberg Group, 1995:928). B6 is essential for antibody formation, important in detoxification functions of the body (Mindell, 1991:33). B6 is essential for synthesizing and breaking down most amino acids. The amino acids L-methionine, L-Cysteine, and L-glutathione play important roles in helping detoxify the body of heavy metals and other toxins (Chaitow, 1988).

**Pyridoxal-5-Phosphate (2mg)** is one of the essential components of vitamin B6 (Mindell, 1991:33). B6 has been reported to be a copper antagonist. B6 deficiency can enhance iron absorption, which may lead to iron toxicity. (Eck & Wilson, 1989:22; 28;).

**Boron (as aspartate, 3mg)** has been reported to enhance the uptake and spare the loss of calcium, magnesium, and phosphorous from the body (Lininger, 1998:142). Both calcium and magnesium are reported to bind with aluminum, cadmium, excess copper, and help eliminate it from the body (Balch & Balch, 1997:123, 176, 214). Adequate calcium is reported to prevent lead from being deposited in body tissues (Balch & Balch, 1997:363). Calcium and magnesium have been reported to protect against radiation, especially radioactive strontium (Balch & Balch, 1997: 455). In studies with postmenopausal women, 3 mg of boron per day significantly reduced calcium lost in the urine (Hunt, CD, et al, *Am J Clin Nutr* March 1997; 65(3): 803-13). Boron supplementation in both animals and humans results in higher estradiol, (natural human estrogen level), higher testosterone levels, and higher vitamin D levels (Samman, S, et al, *Biol Trace Elem Res* Winter 1998; 66(1-3): 227-35). Low levels of boron in tissues have also been linked to lower hormonal levels. Boron is now suspected of being a mineral regulator of many minerals, in addition to calcium, magnesium, and phosphorous, but its exact mechanisms, its possible antagonisms and protective functions are still unclarified (Naghii, MR, Samman, S, *Prog Food Nutr Sci* Oct Dec 1993; 7(4): 331-49). However, boron is combined with steel in nuclear utility plants to trap radiation (*Boron*, National Academy Press, 1980: 71-83). It is also used in experimental drugs for trapping neutrons in radiation therapy and it may--we believe--play a protective role against uranium, radium, and radon's damaging effects (Chou, FI, et al, "Preparation and in vitro evaluation of B-lipiodol as a boron delivery agent for neutron capture therapy of hepatoma," *Anticancer Res* May-June 1999; 19(3A): 1759-64).

Adequate calcium and vitamin D intake can help prevent or reverse osteomalacia caused by cadmium poisoning (Eck & Wilson, 1989:11). Boron increases calcium and vitamin D levels.

Higher levels of calcium, magnesium, and phosphorous have been found to protect against lead toxicity. Calcium and phosphorous either compete with lead for absorption, or help replace lead in storage sites (Eck & Wilson, 1989:39; 40; 41). Boron increases levels of calcium, magnesium, and phosphorous.

**Apple Pectin** (100mg) has been reported to bind with heavy metals in the colon and help excrete them from the body. Apple pectin has been reported especially to help protect against arsenic, lead, mercury, and nickel (Balch & Balch, 1997:123, 135, 363, 386, 404,).

**Asparagus** (herb) [100mg] is a member of the allium, lily family, which includes asparagus, garlic, and onions. The allium family contains sulfur compounds that have been reported to help eliminate arsenic, cadmium, excess copper, lead, mercury, nickel, radiation products, from the body (Balch & Balch, 1997:135, 176, 215, 364, 387, 404, 456). In addition, asparagus has been traditionally used as a diuretic. Aluminum is excreted principally through the urine, and Eck and Wilson (1989) reported that enhancing eliminative organ activity helps in heavy metal detoxification. Asparagus has been reported to enhance female hormone levels and was used for that purpose in India to relieve menstrual pains (sometimes linked to copper overload, Schmitt, 1991), and generally strengthen the female reproductive system. By enhancing female hormone levels, calcium, magnesium, and phosphorous levels may increase and antagonize heavy metals. In China, asparagus therapy has been traditionally prescribed for “kidney deficiency” and severe “adrenal deficiency,” syndromes associated with chronic exhaustion and fatigue. By strengthening the kidney, elimination of heavy metals through the urine may be enhanced. Asparagus contains steroidal and bitter glycosides and asparagine, an amino acid, which functions to help detoxify the brain of excess ammonia. It has been traditionally used as a diuretic, nutritive tonic, and to strengthen the lungs (Tierra, 1990:110-111).

**Testimonials/Nutrient Tidbits:** A doctor reports . . . I can't believe how quickly my patient started dumping toxins after taking Total Boron.

**Suggested Dosage:** 1-2 tablets daily or as directed

**Size:** 90 tablets

**Vegetarian:** Yes

**Contraindications:** Since one of the mechanisms of bone protection is increasing estradiol levels, boron may not work for some sensitive pre-menopausal women.