

New ingredient approval a major challenge

specialties

The global market for biocides is characterized by a vast array of end uses and a limited number of products. The latter is due to stringent regulatory requirements, especially in developed markets such as the United States and Europe, which require costly and time-consuming testing and approval for new biocide active ingredients. BWA Water Additives (Atlanta) says that it took a couple of years for its new biocide active, tributyl tetradecyl phosphonium chloride (TTPC), to go through all the necessary testing and approval procedures in the United States in the mid-to-late 2000s. TTPC, which was introduced in 2007, was the first new biocide active on the US market in about a decade, according to Shahnoz Hamidi, v.p./marketing with BWA.

The global market for biocides totaled about \$5.47 billion in 2010, the most recently available figures, according to IHS Chemical. The average growth rate from 2010 to 2015 is expected to total about 3.1%/year, IHS Chemical says. The slowest growth will be in Japan, at 0.5%/year, while the fastest growth will be in China, at 5.4%/year. North America, at about \$2.46 billion, is the largest regional market for biocides mostly because of the large number of pools and spas, a key biocides end market, IHS Chemical says. Total global biocides capacity was about 1,170,000 m.t. in 2010.

IHS Chemical agrees that complex regulations make introducing new biocide product difficult. In Europe, this situation is particularly evident; as of 2010, about 1,000 biocide actives had vanished from the market since the European Union's Biocidal Products Directive went into force in 2005. "No company in the biocides field is known to be developing new biocidal actives in this region," IHS Chemical says.

In the United States, where biocides are regulated by EPA (Washington), it is somewhat less onerous to introduce new biocidal active ingredients but is still challenging—as BWA Water Additives learned. "Registrants are required to submit data—efficacy testing, aquatic toxicity, ecological testing, etc.—aimed at the product's primary use and applications. It is quite a process to do these studies and prepare the data," Hamidi says.

Approvals tend to be good only for specific applications. BWA's TTPC product line is aimed at the industrial water treatment market and the oil and gas market, both of which are core segments for the company. Registrations are also related to how the product is discharged: The registration for TTPC is applicable to where the product is not being direct discharged, meaning if it is discharged at all, it must go to a municipal wastewater treatment plant. Additional studies would be needed if the registration were to be broadened, Hamidi says.

Strict registration rules can make even finding new uses for existing biocides a challenge, according to Hamidi. Biocides are used in paints coatings, preservatives, medical equipment, water treatment, and a number of other applications. However, a product that is approved for use in one of those applications cannot necessarily be used in another application without being approved for that specific purpose.

BWA's TTPC product line, for its part, was used in a relatively small market when it was first introduced six years ago, but the company is now looking to broaden the product's customer base. "We immediately got traction in industrial water for very hard-to-treat cooling towers, where they tried everything and just couldn't keep it clean or just couldn't eliminate algae," Hamidi says. The product worked well in such applications because it was able to keep the cooling system free of bacteria and biofilm for an extended period, while also acting fast—unusual, since nonoxidizing biocides, like TTPC, typically don't kill quickly. Now, however, the company is now exploring using TTPC in dual-biocide programs, which are used in over half of industrial water cooling systems, Hamidi says. A dual-biocide program couples a nonoxidizing biocide, such as TTPC, with a faster-acting, complementary oxidizing biocide.