Diamond

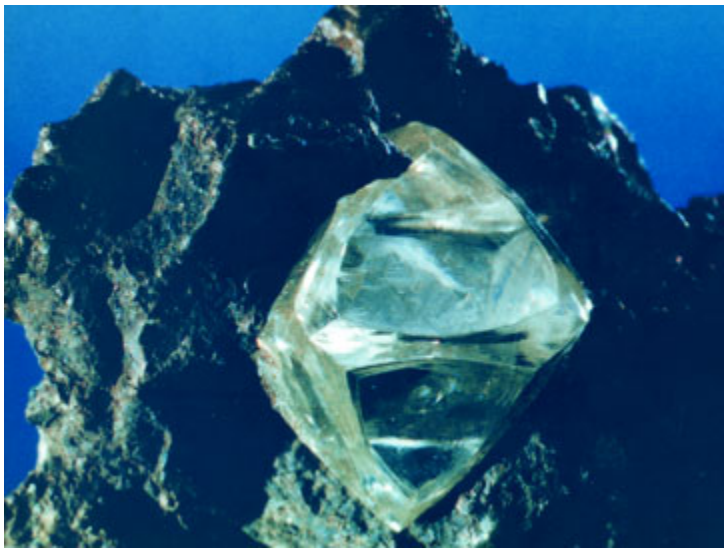
Diamond, this month's featured mineral resource commodity, may well be the world's most versatile engineering material and most famous gemstone. Donald Olson, diamond commodity specialist for the U.S. Geological Survey, has prepared the following information from 2001 about diamond, which has the highest thermal conductivity of any material at room temperature and is also the strongest and hardest known material.

Kelsey Lake in northern Colorado is the operating commercial gem diamond mine in the United States; in the Northwest Territories of Canada, the Ekati mine is producing; and two more, Diavik and Snap Lake, are under development. Production outside North America was mostly in Western Australia, Russia, southern Africa and South America. De Beers Group companies mine about one-half of the gem diamonds produced each year. De Beers also sorts and valuates about two-thirds (by value) of the world's annual supply of rough gem-quality diamonds through its subsidiary, the Diamond Trading Co. (DTC). Prices are supported by managing the quantity and quality of the diamonds relative to demand, a function performed by DTC.

Estimates show that the U.S. market for unset gem-quality diamonds in 2001 exceeded $10.5 billion, accounting for more than one-third of world demand. Globally, sales of rough diamonds decreased 21.5 percent between 2000 and 2001, and retail diamond sales dropped 5 percent around the world, due to the current economic situation. In the United States, however, increased sales of engagement rings after September 11 boosted retail diamond sales.

Diamond that does not meet gem quality standards for color, clarity, size or shape is used principally as abrasives, and termed "industrial diamond." Even though it is more expensive than competing abrasive materials, diamond has proven more cost effective in numerous industrial processes because it cuts faster and lasts longer. The largest use for industrial diamond is as an abrasive on the cutting edges of saws used in highway construction and repair work. Synthetic industrial diamond is superior to its natural diamond counterpart because synthetic diamond can be produced in unlimited quantities. Also, its properties can be tailored for specific applications. Consequently, manufactured diamond accounts for 92 percent of the industrial diamond used worldwide.

Originally published as *Geotimes* Mineral Resource of the Month, December 2002



Naturally occurring diamond crystal. Image from *Minerals in Your World*.