

Tunellite

SrB₆O₉(OH)₂•3H₂O

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Crystal Data: Monoclinic. *Point Group:* 2/*m*. As crystals, to 10 cm, elongated along [001], or flattened on {100}, showing {100}, {001}, {110}, {011}, {111}; as compact fine-grained nodules.

Physical Properties: *Cleavage:* On {100}, perfect; on {001}, distinct. *Tenacity:* Flexible, inelastic, sectile. Hardness = 2.5 D(meas.) = 2.40(1) D(calc.) = 2.391

Optical Properties: Transparent. *Color:* Colorless to grayish white. *Luster:* Subvitreous, pearly on {100} faces and cleavages.

Optical Class: Biaxial (+). *Orientation:* $Y = b$; $X \wedge a = 29^\circ$; $Z \wedge c = -5^\circ$. *Dispersion:* $r > v$, weak. $\alpha = 1.519(3)$ $\beta = 1.534(2)$ $\gamma = 1.569(2)$ 2V(meas.) = n.d. 2V(calc.) = 68°

Cell Data: *Space Group:* $P2_1/a$. $a = 14.415(3)$ $b = 8.213(1)$ $c = 9.951(2)$
 $\beta = 114.05(1)^\circ$ $Z = 4$

X-ray Powder Pattern: Furnace Creek district, California, USA.
6.57 (100), 4.525 (11), 3.867 (9), 5.138 (8), 3.592 (8), 2.503 (8), 6.78 (7)

Chemistry:

	(1)	(2)
B ₂ O ₃	53.70	54.31
SrO	27.71	26.95
H ₂ O	18.71	18.74
Total	100.12	100.00

(1) Boron, California, USA; H₂O by loss on ignition. (2) SrB₆O₉(OH)₂•3H₂O.

Occurrence: A rare secondary mineral formed in borate deposits.

Association: Inderite, kurnakovite, ulexite, hydroboracite, colemanite, realgar, stibnite, celestine, analcime.

Distribution: In the USA, in California, from the Kramer borate deposit, Boron, Kern Co.; at the Thompson mine, near Ryan, Furnace Creek district, Death Valley, and in the east Kramer district, Inyo Co. In Turkey, from the Günevi and Kireçlik deposits, Bigadiç borate district, Balıkesir Province; in the Killik and Espey borate mines, near Emet, and at Sarıkaya, near Kirka, Kütahya Province.

Name: To honor Dr. George Gerard Tunell, Jr. (1900–1996), Professor of Geology, University of California, Los Angeles, California, USA.

Type Material: National Museum of Natural History, Washington, D.C., USA, 123928.

References: (1) Erd, R.C., V. Morgan, and J.R. Clark (1961) Tunellite, a new hydrous strontium borate from the Kramer borate district, California. U.S. Geol. Surv. Prof. Paper 424-C, 294–297. (2) (1962) Amer. Mineral., 47, 416 (abs. ref. 1). (3) Burns, P.C. and F.C. Hawthorne (1994) Hydrogen bonding in tunellite. Can. Mineral., 32, 895–902.