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We describe the boundaries of the convex hulls of perhaps the simplest compact curves in three-dimensional space, pairs of circles. This convex hull consists of a 1-dimensional family of line segments (called the edge surface) and one or two discs. This edge surface is in general an irrational ruled surface whose rulings form a $(2, 2)$ -curve in the product of the circles. We classify which real $(2, 2)$ -curves arise, and use this to classify the convex hulls. (Received September 24, 2012)