The microstructures of pearlite, bainite, and spheroidite all consist of $\alpha$-ferrite and cementite phases. For pearlite, the two phases exist as layers that alternate with one another. Bainite consists of very fine and parallel needles of ferrite that are separated by elongated particles of cementite. For spheroidite, the matrix is ferrite, and the cementite phase is in the shape of spheroidal-shaped particles.

Bainite is harder and stronger than pearlite, which, in turn, is harder and stronger than spheroidite.

Below is shown the isothermal transformation diagram for a eutectoid iron-carbon alloy, with time-temperature paths that will yield (a) 100% coarse pearlite; (b) 50% martensite and 50% austenite; and (c) 50% coarse pearlite, 25% bainite, and 25% martensite.