Oxygen Window

The term “Oxygen Window,” (OW) was first used in designing decompression by Albert R Behnke (1967), It is based on an already described phenomenon of the undersaturation of blood compared to air at ambient pressure by Krogh at the beginning of the twentieth century.

This unbalance is caused by the metabolic consumption of oxygen, where oxygen is converted into uneven amount of carbon dioxide (CO_2) and CO_2 dissolves much more readily in plasma than oxygen, creating a “void” in the venous side of the tissue. As a result, our metabolism is responsible for around an equivalent of 70mbar pressure difference between the venous side of tissue and ambient pressure.

The ideal bubble free decompression model would use this vacancy to eliminate the inert gas without exceeding the saturation limit. (no excess gas, no bubbles, no troubles). On the other hand, if a bubble is formed due to inadequate decompression, oxygen window becomes the driving force for inert gas elimination from bubbles and determines the degree of supersaturation. Breathing higher PO_2 mixes further increases the magnitude of the OW thereby eliminates bubbles more efficiently.