The invention relates to a metal powder for additive manufacturing having a composition comprising the following elements, expressed in content by weight: 0.01 %≤C≤0.2 %, 2.5 %≤Ti≤10 %, (0.45×Ti)-1.35 %≤B≤(0.45×Ti)+0.70 %, S≤0.03 %, P≤0.04 %, N≤0.05 %, O≤0.05 % and optionally containing: Si≤1.5 %, Mn≤3 %, Al≤1.5 %, Ni≤1 %, Mo≤1 %, Cr≤3 %, Cu≤1 %, Nb≤0.1 %, V≤0.5 % and comprising eutectic precipitates of TiB_2 and optionally of Fe_2B, the balance being Fe and unavoidable impurities resulting from the elaboration, the metal powder having a mean roundness of at least 0.70. The invention also related to its manufacturing method by argon atomization.