

The invention deals with a process for manufacturing a steel part, comprising the following successive steps: providing a steel sheet having a composition comprising by weight percent: C: 0.05 – 0.25 %, Mn: 3.5 – 8 %, Si 0.1-2 %, Al: 0.01-3 %, S $\leq$ 0.010 %, P $\leq$ 0.020 %, N $\leq$ 0.008 %, and comprising optionally one or more of the following elements, in weight percentage: Cr: 0 – 0.5 %, Mo: 0 – 0.25 %, the remainder of the composition being iron and unavoidable impurities resulting from the smelting, and having a microstructure comprising, in surface fraction, between 10 % and 50 % of retained austenite, 50 % or more of the sum of ferrite, bainite and tempered martensite, less than 5 % of fresh martensite, less than 2 % of carbides and a carbon [C]_A content in austenite, strictly more than 0.4 % and strictly less than 0.7 %, cutting said steel sheet to a predetermined shape, so as to obtain a steel blank, heating the steel blank to a temperature T_{warm} comprised from (Md30-150 °C) to (Md30-50 °C), punching or shearing and forming the heat-treated steel blank at the said T_{warm} temperature to obtain a steel part.