Laminated Fe-34.5Mn-0.04C composite with high strength and ductility

To obtain a good combination of strength and ductility, a laminated composite structure composed of recovered hard lamellae and soft recrystallized lamellae has been produced in a single phase austenitic Fe-34.5 Mn-0.04C steel by cold rolling and partial recrystallization. Enhanced mechanical properties in both strength and ductility have been obtained in the composite structure compared to a fully recrystallized coarse grain structure. A further increase in strength with only minor loss in total elongation has been achieved by a slight cold rolling of the composite structure, which also removes the small yield drop and Lüders elongation observed in the composite structure.