We summarize methods of construction of spacetimes with nonexpanding impulsive gravitational waves, in particular, limit case of Kundt family including gyratonic spacetimes. Subsequently, using $\mathcal{C}^1$-matching procedure leading to refraction formulae of geodesic trajectories crossing the impulsive hypersurfaces, we study behaviour of free test particles. We conduct a physical analysis and a visualisation of geodesic motion for selected spacetimes of our interest. As a part of this work we created a Python programming language package *GRImpulsiveWaves* for interactive visualisation of geodesic motion based on refraction formulae.