Abstract: Complexity in product design, e.g. in product architectures or process structures, continuously increases. To properly evaluate a complex system or to compare it to other systems, complexity metrics enable the numerical assessment of a system’s underlying structure. The more complex such a structure is, the more likely it is to have many linkages between the elements. Typically, the number of edges that cross each other increases with the degree of complexity. This fact is used to derive a complexity metric that computes the distance of a given network from an ideally planar graph, i.e. a network that has no edges that cross each other. The approach proposed closes an existing lack of structural criteria and metrics and complements the existing possibilities to measure structural complexity, i.e. the particular interaction of a system’s elements and their interdependencies. To this day, planarity is not used in this context. The metric is developed based on a state-of-the-art algorithm and tested with a small example from an industrial design process to illustrate its independence to existing complexity metrics.