Explosive reactive armor (ERA), like any other type of armor, is measured by its effectiveness. Generally speaking, it is obvious that the higher the effectiveness, the better. The problem with this statement is that in some cases low-weight ERA is desired, while in other cases the need is for small volume ERA. In one case, only a small amount of explosive is requested (for light vehicles), whereas in other cases the sensitivity of the effectiveness to the impact point is what counts. In some cases we wish to disrupt the fast parts of the jet, the precursor, while in other cases we must stop the entire jet, including the appendix. Sometimes the edge effects of each cassette are of main concern whereas at other times, the overall effectiveness of the area covered with the special armor may be more important. There are also cases in which the most important parameter, from the system perspective, is the overall penetration level of the target area from various angles. In some cases the area that is exposed after impact is an important factor, and in other cases the collateral damage is of importance, and so on.

It is clear that there are many ways to examine the effectiveness of an ERA system. Some of the parameters are related, but in some cases they are not, as will be demonstrated in this paper. Likewise, some of the parameters are related to the cassette and some to the system design. In the following discussion, several main cassette design parameters are analyzed:

1. Minimizing the weight and the space needed for the added-on ERA cassettes, and calculating the effectiveness of the cassette with respect to each of these requirements.
2. Minimizing the precursor, i.e. the part of the jet that escapes through the first hole created in the cassette before the plates accelerate to their final velocities and re-interact with the jet. This ability will be referred to as the opening effectiveness or efficiency of the ERA cassette.
3. The effect of changing the strength and density of the cassette plates.
4. The length of the jet that interacts with the cassette is strongly affected by the amount of explosive between the two plates. The cassette length effectiveness is related to the edge effect, as will be discussed in the presentation.

Various methods of defining ERA effectiveness are described, the effectiveness parameters of the mass-flux model and its derivatives, the effect of material properties, the escape length of the jet tip precursor, the explosive layer thickness, and the edge effects are analyzed, and correlations between them will be presented. Analysis results are compared with available experimental data and a very good correlation is found.