Effective Net Area (A_e)

A structural member is usually composed of several flat legs or elements joined together. The simplest member is a plate which consists of only one element. An angle consists of two elements. The familiar "I-beam" has five elements.

If all elements of a structural member has a fastener, then the formula for net area in Section D can be used. However, some elements may not have a fastener. For instance, W-sections, the web may have no fasteners. In such cases, the structural member is weaker than the same structural member with fasteners on all elements. To account this weakness, the net area is reduced by a **reduction coefficient** U which is less than or equal to unity. The result is an **effective net area** A_e given by

$$A_e = U A_n$$

	Type of members	Minimum fasteners per line	Effective net area, A_e
(a)	Members having all elements connected to transmit tensile force	1	A_n
(b)	Short connecting members such as gusset plates	1	$\min\{A_n, 0.85A_g\}$
(c)	W, M, or S rolled shapes connected only at the flanges and satisfying $b/d \geq 0.67$	3	$0.90A_n$
(d)	Structural tees cut from sections described in (c)	3	$0.90A_n$
(e)	W, M, or S rolled shapes not satisfying $b/d \geq 0.67$ and other shapes	3	$0.85A_n$
(f)	All shapes	2	$0.75A_n$