End Attachments - End Attachment Efficiency

Nominal splice efficiency is the ratio determined by dividing the actual breaking strength of the spliced termination by the actual breaking force of the wire rope. This efficiency will change from splice to splice because of the many variable factors involved in producing the splice. Splice efficiencies given in the following tables were established so that these normal variations are accommodated. The design factor used in establishing the rated capacities further assures that the sling will lift the load even in those rare instances when the splice efficiency falls slightly below the values given in the tables.

In addition to the following charts, all multi-part slings are based on 70% efficiency and swaged and spelter socket assemblies are 100% efficient.

Nominal Splice Efficiencies
Hand Tucked Splice
IPS, XIP, XXIP IWRC 6x19 and 6x36 Class Ropes

Rope Diameter (inches)	Nominal Efficiency Factor*
1/4	.90
5/16	.89
3/8	.88
7/16	.87
1/2	.86
9/16	.85
5/8	.84
3/4	.82
7/8	.80
1	.80
1-1/8	.80
1-1/4	.80
1-3/8	.80
1-1/2	.80
1-5/8	.80
1-3/4	.80
1-7/8	.80
2	.80
2-1/8	.80
2-1/4	.80
2-3/8	.80
2-1/2	.80

*Based on Flemish Eye splice. Splice efficiencies for other splicing methods should be confirmed.

Nominal Splice Efficiencies
Mechanical Splice Slings

Diameter (Inches)	IWRC	Fiber Cores
Improved Plow Steel (IPS):		
1/4 through 1	.95	.925
1-1/8 through 2	.925	.90
2-1/8 & larger	.90	Not Established
Extra Improved Plow Steel (XIP®):		
1/4 through 1	.95	.925
1-1/8 through 2	.925	.90
2-1/8 & larger	.90	Not Established
Extra Extra Improved Plow Steel (XXIP®):		
1/4 through 1	.95	Not Established
Stainless Steel, 302 & 304 Grade:		
1/4 through 1	.95	Not Established
1-1/8 through 2	.925	Not Established
2-1/8 & larger	.90	Not Established

Nominal Splice Efficiencies
Cable Laid Hand Tucked Grommets

Grommet Body Diameter (inches)	Nominal Efficiency Factor
3/8	.78
9/16	.78
5/8	.78
3/4	.775
15/16	.770
1-1/8	.765
1-1/2	.755
1-11/16	.750
1-7/8	.745
2-1/4	.735
2-5/8	.725
3	.715
3-3/8	.710

Nominal Splice Efficiencies
Strand Laid Hand Tucked Grommets

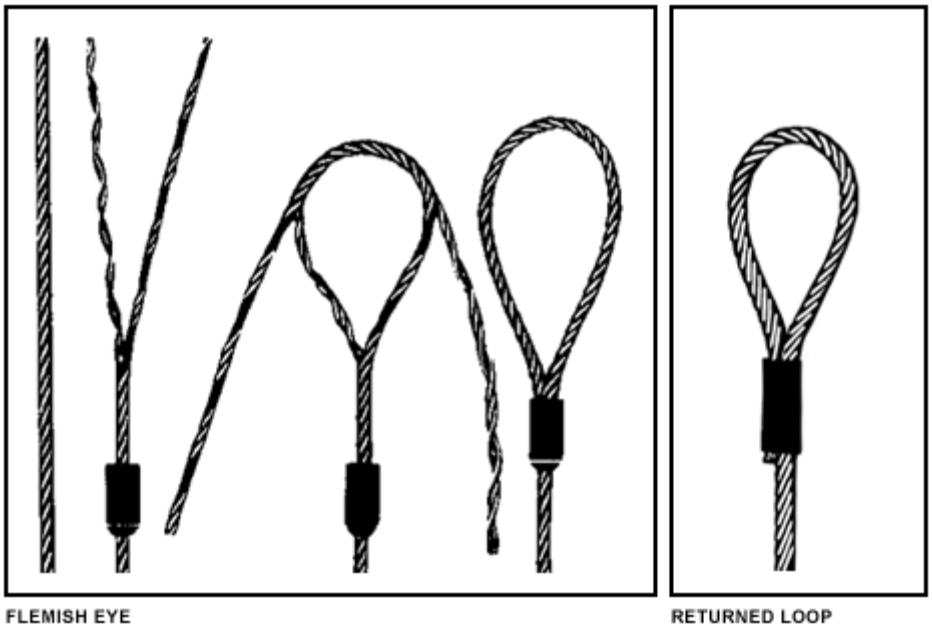
Rope Diameter (inches)	Nominal Efficiency Factor
1/4	.78
5/16	.78
3/8	.78
7/16	.78
1/2	.78
9/16	.78
5/8	.78
3/4	.78
7/8	.78
1	.775
1-1/8	.765
1-1/4	.755
1-3/8	.745
1-1/2	.735
1-5/8	.730
1-3/4	.725
1-7/8	.720
2	.715
2-1/8	.710
2-1/4	.705
2-3/8	.700
2-1/2	.695
2-5/8	.690
2-3/4	.690
2-7/8	.685
3	.685

End Attachments - Flemish Eye vs. Returned Loop

Mechanical Splice slings come in two basic types: the **Flemish Eye** and the **Returned Loop**. In either case, the splice is completed by pressing (swaging) one or more metal sleeves over the rope juncture.

WRCA recommends that wire rope slings with traditional eye terminations used for overhead lifting be fabricated with Flemish Eye splices. In the standard Flemish eye splice the wire rope is separated into two parts, one having three strands and the other having the remaining three strands and the core. The rope is unlayed to allow the loop or eye to be formed by looping one part in one direction and the other part in the other direction and laying the rope back together. The strands are rolled back around the rope body. A metal sleeve is then slipped over the ends of the splice and pressed (swaged) to secure the ends to the body of the sling. Mechanically spliced slings have a higher rated capacity than hand spliced slings. One safety advantage of the Flemished splice is that should the sleeve ever fail the splice is still present to provide holding strength. This is not the case with a turnback eye.

The returned loop is fabricated by forming a loop at the end of the rope, sliding one or more metal sleeves over the short end of the loop eye and pressing these sleeves to secure the end of the rope to the sling body. The approved materials for the sleeve are carbon steel and stainless steel, copper is also approved for rope diameters 3/8" and less. All return loop eyes are required to be proofloaded to twice the working load limit per ASME B30.9. A drawback to this type of sling is that the lifting capacity of the sling depends completely upon the integrity of the pressed or swaged joint. Should the metal sleeve(s) fail, the entire eye will also fail.



FLEMISH EYE RETURNED LOOP

Swaging provides positive grip

This cutaway of a metal sleeve swaged onto a splice shows how metal "flows" into valleys between strands to positively prevent ends from unlaying when sling is used within its rated capacity.