Recommendations for Cutting Field Segment Elbows

Most pipe fittings being field segmented are High Yield fittings. This means the fitting have been heat treated to obtain elevated physical properties to meet the end users specifications. To meet the higher physical properties the fittings typically get an Austenize, quench and temper per the applicable ASTM / ASME standards during heat treat. This type procedure induces stress into the fitting to achieve the physical properties. Because of this stress it is highly recommended that the following procedures be followed to lessen the amount of springing during cutting.

1) Preheat the fitting equally 360 degrees in the area to be cut. Preheating evenly 200 – 300 degrees F before cutting will help reduce springing. The use of a star torch is useful in ensuring the part is heated evenly. This technique tends to be very helpful in colder climates.
2) When torching, maintain proper air fuel mixture on the cutting torch. Too high of a fuel mixture not only waste fuel but it needlessly overheats the steel aggravating the springing affect.
3) When cutting try to keep starts and stops to a minimum. The more you start and stop cutting the more uneven stresses are induced into the part. Lots of blow holes equals lots of added stress into the fitting. Try to limit blow holes to 2 or less. The use of a ring type cutting torch is highly recommended. This will limit blow holes to only one.
4) It is recommended that the segment cut for use have one factory beveled end. It is also recommended that the segment to be used off a 45 be no less than 22.5 degrees. Along the same thinking, the segment to be used cut from a 90 be no less than a 45 degree.
5) Use fitment clamps. The use of fitment clamps like those offered by Mathey Dearman are highly recommended. A fitment clamp may take a few minutes to install before or after cutting but that time will easily be made up in the efficiency of having perfect weld joints every time.

Recommended reading

The Pipe Fitters & Welders Pocket Guide and Pipe Fitters Blue Book are excellent guides for any pipe liner working in the field.