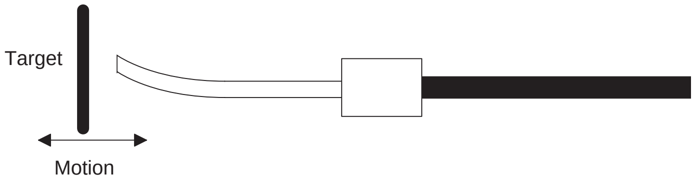
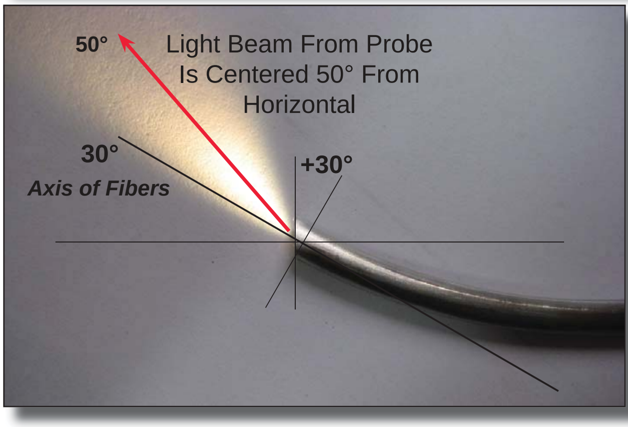
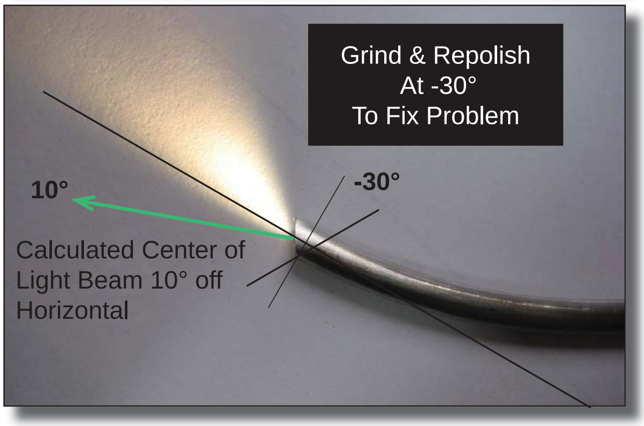
Bending Light

THE PROBLEM

A customer required a curved fiber optic probe to measure the motion of a target as shown here. As suggested by the customer, we ground and polished the face of the probe parallel to the face of the target, which meant that the ends of the fibers were polished to a +30° angle. When we illuminated the fibers to calibrate the probe it was discovered the light beam was bent 50° from the desired horizontal projection ...

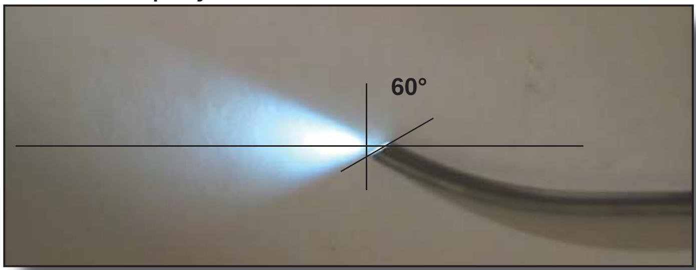


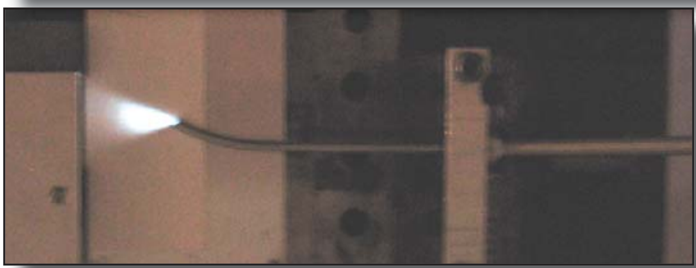




THE SOLUTION

A Snell's Law calculation showed that changing the polish angle from +30° to -30° should bend the light beam down to 10° off the horizontal direction. The probe was ground and repolished at -30°. The resulting beam of light emitted at the desired horizontal projection.





OTHER APPLICATIONS

This concept of bending light can be applied to other applications that can only permit the use of straight probes. For example,

where space restrictions do not allow the installation of a bent or curved probe to achieve perpendicularity to a target, polishing a straight probe tip to the appropriate angle can achieve the desired perpendicularity of the light beam.....

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