

## Comparing Contacting and Non-contacting RF probes (Slugs)

### Comparison, Contacting versus Non-Contacting RF Probes (Slugs)

Focus manufactures both, contacting and non-contacting probes (slugs). Contacting probes seem to have an obvious disadvantage of “wear-out”, whereas non-contacting probes do not.

Mean Time Before Failure (MTBF)

The MTBF analysis, conducted based on recent (2 yrs) experimental data and material properties shows that the expected life-time of an aligned tuner regarding probe wear-out exceeds well 10 years at 50 hours/week non-stop operation.

Figure 1 shows the conclusion of this report.

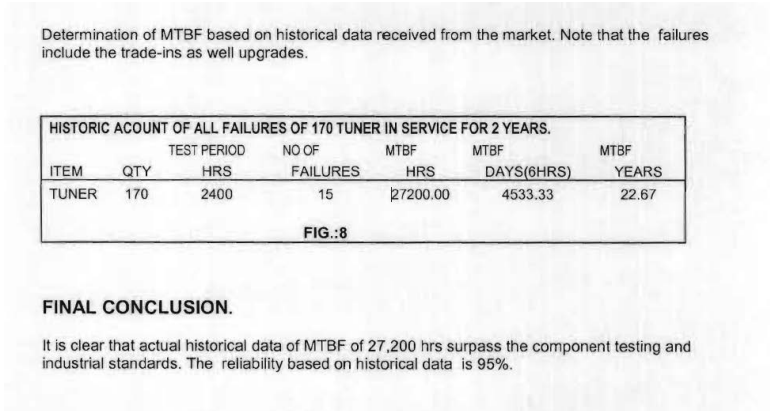


Figure 1: MTBF tuner calculation based on probe wear-out.

### RF Performance Comparison

In general terms non-contacting probes are prone to vibration sensitivity (microphonism or conversion of mechanical changes into electrical changes). A setup using such tuners shall therefore be absolutely stable, both during calibration and operation, tuner transportation from one to the next bench must also be extremely carefully done. Data supporting this experience are difficult to collect and display.

From RF performance point of view, contacting probes have a higher bandwidth and do not display resonances.  
 This can be seen on figure 2.

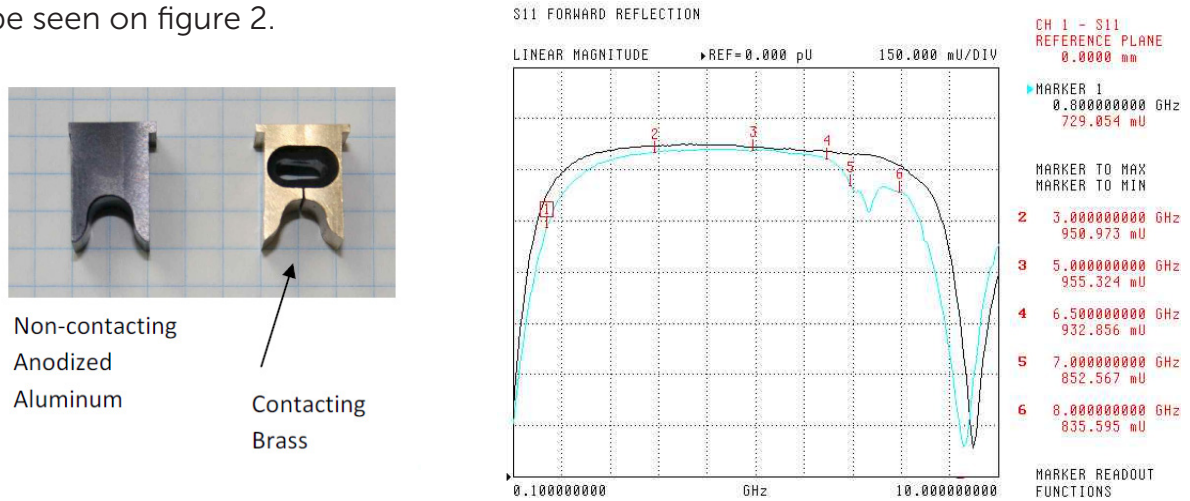


Figure 2: RF response of contacting versus non-contacting 0.8-8GHz probe. Resonances, reduced reflection factor and bandwidth are obvious.

### Conclusion

For practical purposes contacting probes offer more advantages than non-contacting ones and are the preferred technique used by Focus Microwaves.