

Low Interfacial Tension Measurements

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The pendant drop technique can be used with low interfacial tensions as long as magnification is adjusted to match the resultant drop size (think of size \approx maximum diameter). The following table shows representative interfacial tensions for various drop sizes and density differences between the two phases.

For a given drop *size and shape*, interfacial tension is directly proportional to density difference. For a given drop *shape*, interfacial tension is directly proportional to drop size. For a given drop *size*, a "round" drop will have high interfacial tension and a stretched "long" drop will have a lower interfacial tension. These relationships allow you to estimate the size and shape for other configurations. Note, in particular, if the density difference is lower (and it is for many fluid combinations), lower interfacial tensions fall within the measurement range.

The table shows interfacial tension values (dynes/cm or mN/m) for "round" and for "tall" drops. These are not hard limits, but are rather general guidelines. You might expect to make measurements of interfacial tensions 10% higher or lower than the respective limits.

Size (mm)	Density Difference = 1g/cc		Density Difference = 0.6g/cc	
	Round	Tall	Round	Tall
2	47.20	13.97	28.32	8.384
1	11.80	3.493	7.079	2.096
.5	2.950	.8733	1.770	.5240
.25	.7375	.2183	.4425	.1310
.125	.1844	.0545	.1106	.03275
.0625	.0461	.01362	.02765	.00818

The FTÅ200 is suitable for drop sizes down to .25mm. An optional magnification adapter can extend that to .125mm. The FTÅ4100 naturally has higher magnification and can easily work down to 62.5 micron drops.