

**Optimum NDT solutions
at cost effective prices**

ADVANCED NDT LTD

Orchard House, Orchard Close
Severn Stoke
Worcester WR8 9JJ
England

Email: sales@advanced-ndt.co.uk

Tel: 44 (0) 1905 371460

Website: www.advanced-ndt.co.uk

Fax: 44 (0) 1905 371477

Yo+ (Focal) Chart

Practical Focal Length Chart

The maximum focal length shown is approximately three-quarters of the distance to the end of the near-field. This theoretical boundary is called Y+, and is based on the sound pressure produced from a theoretical, *single-frequency*, transducer. Even the most narrowbanded transducers manufactured by NDT Systems radiate soundfields having a range of frequencies. The lower frequency components tend to reduce the effective Y+ distance; hence, the 0.75 Y+ maximum. This effect is even more pronounced with broadband transducers such as NDT Systems' High Resolution (HR) Series.

The practical maximum focal length of highly damped transducers tends to be closer to 0.6 Y+. The minimum practical focal lengths listed in the table below can be used to specify transducers useful only for very near-surface applications. Their depth of field is so limited that the soundfield diverges very rapidly beyond the focal point. As a rule of thumb, focal lengths midway between minimum and maximum produce an effective compromise between sensitivity and depth of field.

MHz	Element	Yo+	Beam Dia (-6dB@Yo)	Focus Range		Approximate Beam Diameter @ Percentage of Yo+ Shown (in)		
	Dia - In			Min	Max	25%	50%	75%
0.5	0.5	0.53	0.126	N/P	N/P	N/P	N/P	N/P
	0.75	1.2	0.191	N/P	1.00	N/P	0.095	0.143
	1.00	2.14	0.255	1.00	1.50	0.064	0.128	0.191
	1.125	2.74	0.290	1.50	2.00	0.073	0.145	0.218
1.0	0.125	0.06	0.029	N/P	N/P	N/P	N/P	N/P
	0.25	0.27	0.064	N/P	N/P	N/P	N/P	N/P
	0.375	0.6	0.095	N/P	0.50	0.024	0.048	0.072
	0.5	1.07	0.128	N/P	0.75	N/P	N/P	0.096
	0.75	2.41	0.192	1.00	1.75	0.048	0.096	0.144
	1.00	4.28	0.255	1.50	3.00	0.064	0.128	0.191
	1.125	5.41	0.287	1.50	4.00	0.072	0.143	0.215
2.25	0.125	0.15	0.032	N/P	N/P	N/P	N/P	N/P
	0.25	0.6	0.064	N/P	0.50	N/P	N/P	0.048
	0.375	1.35	0.095	N/P	1.00	N/P	N/P	0.072
	0.5	2.4	0.127	1.00	1.75	0.032	0.064	0.095
	0.75	5.41	0.191	1.50	4.00	0.048	0.096	0.143
	1.00	9.63	0.255	2.00	7.00	0.064	0.128	0.191
	1.125	12.19	0.287	2.00	9.00	0.072	0.144	0.215

Yo+ (Focal) Chart

MHz	Element		Beam Dia (-6dB@Yo)	Focus Range		Approximate Beam Diameter @ Percentage of Yo+ Shown (in)		
	Dia - In	Yo+		Min	Max	25%	50%	75%
3.5	0.125	0.23	0.031	N/P	N/P	N/P	N/P	N/P
	0.25	0.94	0.064	N/P	0.75	N/P	N/P	0.048
	0.375	2.11	0.096	0.75	1.50	0.024	0.048	0.072
	0.5	3.75	0.128	1.00	3.00	0.032	0.064	0.096
	0.75	8.43	0.191	1.50	6.00	0.048	0.096	0.144
	1.00	14.98	0.255	2.00	11.00	0.064	0.128	0.191
5.0	0.125	0.33	0.031	N/P	N/P	N/P	N/P	N/P
	0.25	1.34	0.064	0.50	1.00	0.016	0.032	0.048
	0.375	3.01	0.096	0.75	2.00	0.024	0.048	0.072
	0.50	5.35	0.128	1.00	4.00	0.032	0.064	0.096
	0.75	12.04	0.191	1.50	9.00	0.048	0.096	0.144
	1.00	21.4	0.255	4.00	16.00	0.064	0.128	0.191
7.5	0.125	0.5	0.032	N/P	N/P	N/P	N/P	N/P
	0.25	2.01	0.064	0.50	1.50	0.016	0.032	0.048
	0.375	4.51	0.096	0.75	3.50	0.024	0.048	0.072
	0.50	8.03	0.128	1.50	6.00	0.032	0.064	0.096
	0.75	18.06	0.191	3.50	13.00	0.048	0.096	0.144
10	0.125	0.67	0.032	N/P	0.50	N/P	N/P	N/P
	0.25	2.68	0.064	0.50	2.00	0.016	0.032	0.048
	0.375	6.02	0.096	0.75	4.50	0.024	0.048	0.072
	0.50	10.70	0.128	1.00	8.00	0.032	0.064	0.096
	0.75	24.08	0.191	1.50	10.00	0.048	0.096	0.144
15	0.125	1.00	0.032	0.50	0.75	0.008	0.016	0.024
	0.25	4.01	0.064	0.50	3.00	0.016	0.032	0.048
	0.375	9.02	0.096	0.75	7.00	0.024	0.048	0.072
	0.50	16.05	0.128	1.00	12.00	0.032	0.064	0.096
20	0.125	1.34	0.032	0.50	1.00	0.008	0.016	0.024
	0.25	5.35	0.064	0.75	4.00	0.016	0.032	0.048
	0.375	12.03	0.096	1.00	9.00	0.024	0.048	0.072
25	0.125	1.67	0.032	0.50	1.25	0.008	0.016	0.024
	0.25	6.99	0.067	0.50	5.00	0.017	0.033	0.050