

PRODUCTION GAGING SOLUTIONS

Fast-Accurate Taper Gages & Applications



A.N.S.I. Steep Machine Tool Tapers. 3.5 in / ft. with or without flange contact.

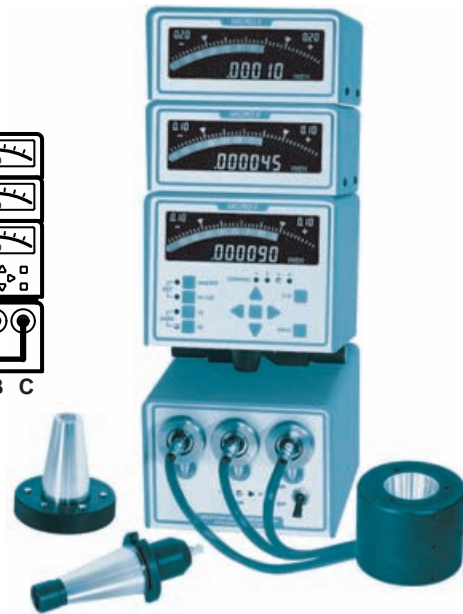
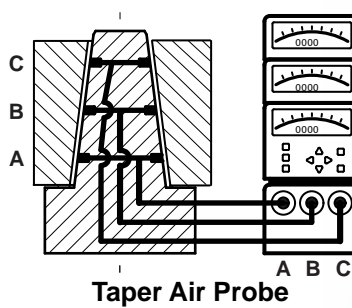
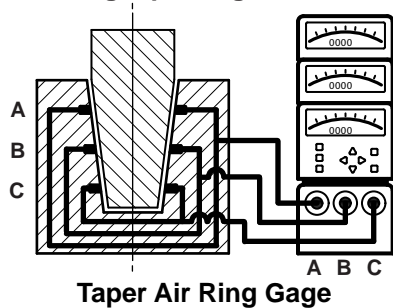


I.S.O HSK 1:9.98 taper ratio and Kennametal KM Tapers with flange contacts.



Medical implant self holding Tapers. Femoral stem and ball socket shown above.

Connected to tapered air probes and air ring gages, **Micro II readouts** are a fast and accurate means of checking taper angles and related reference diameters.



Taper specifications

Taper designs may be specified by an included angle and an angularity tolerance; or the slope may be defined as "Basic" and a "form or contour" tolerance applied to the profile. In either case a datum controlling the size of the taper must be located at some point on the taper. Referred to as a "Reference or Datum diameter", this dimension relates the taper to some feature on the workpiece, such as an adjacent shoulder or a theoretical sharp corner at one end of the taper.

Readout selection

Tapers specified with angularity tolerances require readouts that utilize "A-B" and "A-C" calculation functions to display angularity deviations. Tapers utilizing contour tolerances require direct coupled readouts that display the profile tolerance limits at each set of sensors. **Micro II Readouts** can be configured to check either angular deviations or contour toleranced tapers. See table of order codes for taper gages at right.

Two or Three air circuits

Taper gages that incorporate three air circuits allow the user to determine if hourglass or barrel shapes are super imposed on taper profiles. They are preferred on long tapers where this profiling error is most common; however space limitations often prohibit including the third circuits on short tapers.

Micro II Readouts for Tapers Model numbers & Applications

Readout for taper seating applications only:

AEQ-4(-)-12M Dual circuit with single (A-B) display. (Available as a single mastered readout only.)

Readouts for taper or shoulder seating applications:

AEQ-4(-)-22M Dual circuit with (A) & (A-B) displays.

AEQ-4(-)-32N Dual circuit with (A), (B) & (A-B) displays.

AEQ-4(-)-33M Triple circuit with (A), (A-B) & (A-C) displays.

Readouts for applications with a contour tolerance controlling the "basic" taper profile:

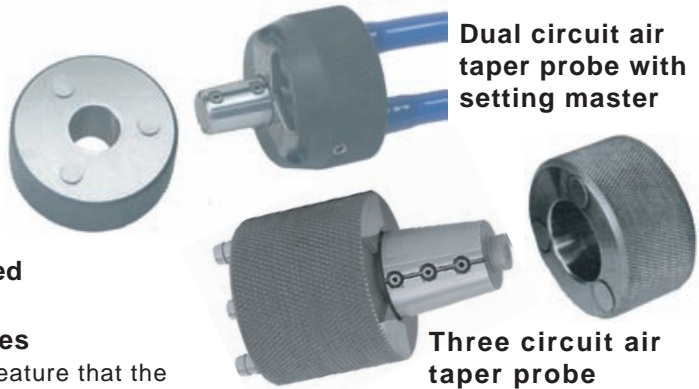
AEQ-4(-)-22 Dual circuit with (A) & (B) displays.

AEQ-4(-)-33 Triple circuit, with (A), (B) & (C) displays.

PRODUCTION GAGING SOLUTIONS . . . Taper Gages



Dual circuit air taper probe mounted on base with setting master

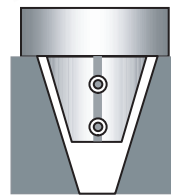


Dual circuit air taper probe with setting master

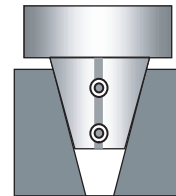
Three circuit air taper probe

Shoulder seating vs Taper seating gages

Taper gages can be designed to seat on the feature that the taper is referenced to, such as an adjacent shoulder; or they may be allowed to seat on the tapered surface itself -- see illustration at the right. The shoulder seating design allows measurement of a reference datum diameter on the taper as well as angular deviation. This design is preferred where the tolerance on the reference datum diameter is closely held. Applications where a reference diameter is not tightly held, a taper seating design is preferred in order to avoid excessive clearance. HSK machine tool tapers and most medical implant tapers are designed to shoulder seat, while nonflange seating American Steep Machine tool holders and many shaft end tapers are design to taper seat.

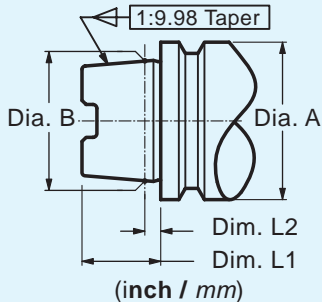


Shoulder seating air taper gage



Taper seating design

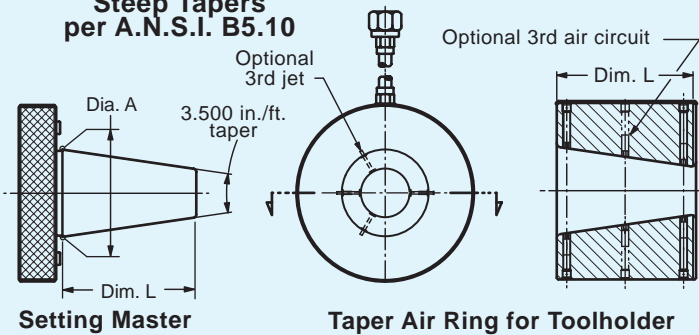
HSK Shoulder Seating Taper per I.S.O. 12164-1



No.	Dia.A	Dia. B	Dim.L1	Dim.L2
40	1.575	1.1814	.7874	.1575
	40	30.007	20	4.0
50	1.968	1.4964	.9843	.1968
	50	38.009	25	5.0
63	2.480	1.8902	1.2598	.2480
	63	48.010	32	6.3
80	3.150	2.3663	1.5748	.3150
	80	60.012	40	8.0
100	3.937	2.9533	1.9685	.3937
	100	75.013	50	10.0

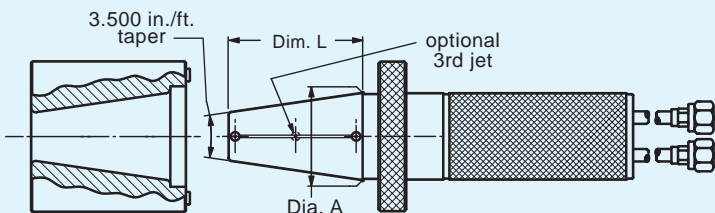
Above data are provided for product identification -- see I.S.O. spec and factory gage drawing for complete specifications.

Machine Tool Holder Steep Tapers per A.N.S.I. B5.10



Setting Master

Taper Air Ring for Toolholder



Setting Master

Taper Air Probe for Spindle

Above data are provided for product identification -- see ANSI spec and factory gage drawing for complete specifications.

No.	Dia. A	Dim L
30	1.250	1.8750
40	1.750	2.5625
45	2.250	3.3125
50	2.750	4.0000
60	4.250	6.3750
		(inch)

Custom Taper Gage Applications -- Send us a drawing of your taper for our engineering review and gage proposal.