

Recently, I was asked for “THE” definition of scope as used when anchoring. While everyone agreed that scope is the ratio of length of rode to depth of water, the measurement of depth was the cause of the discussion. My immediate response was to quote the Boat Crew Seamanship Manual, COMDTINST M16114.5C.

Page 10-70: H.2 Terms and Definitions

Scope

The ratio of the length of the anchor rode to the vertical distance from the bow chocks to the bottom (depth plus height of bow chocks above water).

BUT

Page 10-76 H.13.a. Length of Rode (Scope).

The scope is a ratio of the length of rode paid out to the depth of the water. Enough rode should be paid out so the lower end of the rode forms an angle of 8° (or less) with the bottom. This helps the anchor dig-in and give good holding power.

So there is a difference of opinion as to which is more correct. Upon returning home where more of my resources were available, I found the following:

Boat US: <http://www.boatus.com/boattech/casey/34.htm>

**Scope**

Scope is the ratio of the length of deployed anchor rode to the height of the bow chock above the seabed.

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“Chapman Piloting Seamanship and Small Boat Handling 62ed” Hearst Marine Books, New York, page 254

Scope. The ratio of the length of the anchor rode to the vertical distance from the bow chocks to the bottom (depth plus height of bow chocks above the water).

The 1959 and 1989 editions have very similar wording.

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“Knight’s Modern Seamanship Sixteenth Edition” Van Norstrand Reinhold New York, 1977 page 259

Scope: the length of chain measured from hawse to the anchor by which the ship rides is the scope.

The 1918 Edition of Knight’s does not include this definition.

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Department of the Army Technical Manual TM 55-501 "Harbor Craft Crewman's Handbook" 1958 page 68

A safe minimum anchor rode length in normal weather conditions is a 7 to 1 (rode length to depth) ratio, or 5 to 1 for an all chain rode. "Depth" in this case is the actual depth of the water at high tide, plus the height of the anchor hawser above the water's surface. (Scope = [water depth + hawser height] X 7).

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"Boating Skills and Seamanship Twelfth Ed." US Coast Guard Auxiliary, page 4-21

To compute the "depth" add the distance from the water's surface to the chock the line passes through on your boat to the actual depth of the water.

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An anchor manufacturer: [http://www.rocna.com/kb/Scope\\_vs\\_catenary](http://www.rocna.com/kb/Scope_vs_catenary)

Scope on the other hand is the ratio between the length of rode deployed and the distance the boat is from the seabed (the height from the seabed to the bow-roller or hawse-pipe, not just depth). By way of simple trigonometry, it is obvious that for a constant depth, a longer rode (greater scope) will present a lower angle of pull on the anchor.

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***"The Practical Encyclopedia of Boating: An A-Z compendium of seamanship, boat maintenance, navigation, and nautical wisdom", by John Vigor, published by [The McGraw-Hill Companies, Inc.](#)***

<http://www.answers.com/topic/scope-for-anchors#ixzz1LCedAo3X>

The term *scope* refers to the length of line or chain between the anchor and the boat's bow relative to the depth of water in which the boat is anchored. Thus, a scope of 3 to 1 indicates that a boat lying in 10 feet of water has an anchor line 30 feet long. In fact, the scope is measured to the bow roller, so the distance from the bow to water level must be added to the depth of the water. This is not significant on most small craft, but be aware that when depth of water is mentioned in connection with scope, it really means the distance from the bow roller straight down to the seabed.

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"Sportfish, Cruisers, Yachts Owner's Manual" NMMA Inc page 46

The scope is technically defined as the ratio of the rode length to vertical distance from the bow to the sea floor.

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Another anchor manufacturer: [http://www.fortressanchors.com/safe\\_anchoring.html](http://www.fortressanchors.com/safe_anchoring.html)

Scope is the length of anchor line relative to the distance from your boat's deck to the sea bottom. We recommend at least 5:1 scope.

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Some WEB sites: <http://www.go2marine.com/productcenters/anchoring/>

**Scope** - A normal scope for a line rode is 7:1, which means the rode should be 7 times longer than the depth (including the water to deck height).

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<http://www.commanderbob.com/art40.html>

A safe minimum anchor rode length in normal weather conditions is a 7 to 1 (rode length to depth) ratio, or 5 to 1 for an all chain rode. "Depth" in this case is the actual depth of the water at high tide, plus the height of the anchor hawser above the water's surface. (Scope = [water depth + hawser height] X 7).

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<http://www.wordiq.com/definition/Anchor>

The depth of water is necessary for determining **scope**, which is the ratio of length of cable to the depth measured from the highest point (usually the anchor roller or bow chock) to the seabed.

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On the other hand:

"The Small Boat Handbook", D. Richey, T. Y. Crowell, New York, 1979.

The minimum scope is approximately seven or eight times the distance from the surface to the bottom of the water.

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"Boating Skills and Seamanship", US Coast Guard Auxiliary Tenth Edition, page 2-17.

Scope is the length of the anchor rode measured in units of water depth.

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So references supporting both points of view are available. Unfortunately, I no longer have ready access to the Navy's NAVSEA Tech Manual and my 1945 copy of the Blue Jackets Manual has disappeared. Neither the Eighth nor Ninth edition of the Coast Guardsman's Manual has a discussion of scope.

While common practice may be to use only the depth of the water to determine scope, it appears from the majority of references above that including the distance from the water's surface to the first point of contact with the vessel provides a better number for determining the scope of the anchor rode. Depending on which paragraph in COMDTINST M16114.5C or which other reference is chosen, either usage can be correct.

Studies have shown that increasing the scope beyond 10:1 does not significantly increase the holding power and that less than 3:1 significantly degrades the ability of the anchor to hold.