

THE STEEL SUPPLY COMPANY

Surface Finish Data

Certain terms are used when discussing surface finish. The most common term used is "MICRO FINISH". Micro finish is measured in RMS (Root Mean Squared) or Ra (Arithmetic Average). The instrument used to measure surface finish is called a 'PROFILOMETER'.

The typical methods of producing the finishes here do not include all possible means of obtaining the desired results. The data shows the Maximum Profilometer Reading in RMS (Ra), the ordinary method of producing the finish, and the relative cost to achieve the finish.

An RMS reading of 6 (Ra 5.4) is generally defined in automatic screw machine applications as a superfinish buff. It is produced by a microhone, lap, or very fine buff. This is very expensive when compared to other finishes listed herein.

A max RMS of 8 (Ra 7.25) is ordinarily produced by grinding or after being lapped, honed, fine honed, fine buffed, etc. By comparison to others this is rated as expensive.

A 16 RMS (14.5 Ra) is obtained by a fine grind, or by being lapped, honed, fine buffed, burnished, etc. It is rated as expensive except where a special machine can be used in mass production processes.

A 32 RMS (29 Ra) is achieved using a fine grind or by processes such as being broached, burnished, buffed, cold pressed, smooth emery buff, etc. This is a fairly inexpensive process for hardened steel on a high production basis. It is impractical on automatics except for burnishing operations.

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A 47 maximum RMS ((Ra 42.6) uses a finish grind, a very fine machine finish, broaching, reaming, shaving, buffing, or finishing with emery cloth, etc. This is very difficult and relatively expensive on automatics. This is relatively inexpensive for cylindrical or surface grinding, especially on hardened steel.

A 63 RMS (57.1 Ra) is achieved by processing with a smooth grind, broaching, rolling, very light machine cutting, shaving, turning, boring, milling, reaming, smooth disc grinding, ball seat swaging, etc. This is possible but difficult even with the best tool practice for automatic screw machine work. It is easily attained in many secondary operations.

94 RMS (85 Ra) is less difficult but requires care and proper tooling in all machining operations. It is obtained with a medium grind, light finish tool cut, reaming, shaving, turning, boring, milling, etc.

A 125 RMS (113.3 Ra) is achieved with a commercial grind, finish tool cut, broach, rolling, reaming, shaving, turning, boring, milling, drilling, spot facing, counter-boring, fine filing, etc., application. This finish should be maintained in most automatic operations.

The above information is only to be used as general information for engineering, shop, and inspection departments as to which finishes can be attained with automatic screw machines and various secondary operations.

Grinding has improved over the years and we are now capable of holding 32 RMS (29 Ra) or better on O.D. grinding, and 20 RMS (18.1 Ra) on I.D. honing.