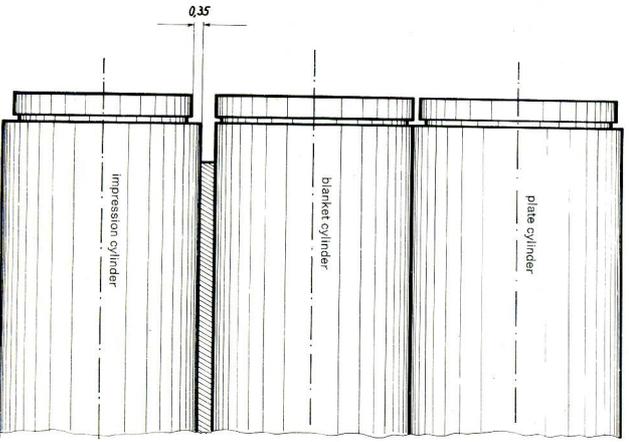


#### Arrangement of three equal size cylinders

Plate and blanket cylinder run in eccentrics so that it is possible to alter the distance between plate and blanket cylinder and between blanket and impression cylinder. The impression cylinder is in fixed bearings and not adjustable. Impression control (impression on/off) further moves the blanket cylinder in the (shaded) arrow direction.



The bearer rings of plate and blanket cylinders are ground to pitch diameter (theoretical diameter is at about centre of teeth on which the toothed wheels roll against each other). The bearer rings serve as measuring basis for packing thicknesses and in zero position are in contact.  
 diameter .028" (.7 mm.) = (.014" [.35 mm.] radius smaller. The contact surface of the impression cylinder is ground to pitch diameter. When printing thin stock, the blanket cylinder can be brought to .1 mm. below zero setting against the impression cylinder.

Cylinder undercut varies between different Roland machines and is shown in the accompanying table.

All measurements of packing thickness - if made with a special dial-type cylinder gauge - are made with the cylinder packed and provide precise values. If measurement is made outside the machine using a disc micrometer, then only preliminary values are obtained which may be useful when deciding on the type cylinder packing.

While impression cylinders used to be frequently packed with a copper plate or Rexine tympan, they are left bare on modern offset machines.

Four factors related to each other influence correct cylinder circumference ratio:

- a the thickness of the stock being printed
- b cylinder packing thickness
- c cylinder scale settings
- d kind and hardness of blanket packing

Apart from packing thickness the hardness of the packing is decisive for the outcome of the printed work, and hardness depends on both the type of blanket underlay being used and also on the Shore hardness of the blanket. There are soft, medium and hard packings. Depending on the measured blanket elasticity, the hardness of blankets is indicated as follows:

- 65-70 Shore = soft
- 70-75 Shore = medium
- 75-80 Shore = hard

Wherever possible, the compression of the blanket, which is unavoidable during impression, should have effect only in the upper blanket layer so as to prevent any give or slip of the underlays. Very suitable hardness is between 74-76 Shore and

blankets of this hardness are suitable for printing both paper and board. The overall hardness of a packing, which greatly influences the extent of impression required, results from the combination of blanket and underlay:

- soft = 1 blanket + 1 felt + paper = 2 blankets
- medium } + 1 underlay blanket + paper = 1 blanket + paper
- hard = 1 blanket + carton/paper

These packings from soft to hard, which suit specific printing requirements and have their characteristic advantages - and also disadvantages - cause makeready, that is the evening out of irregularities the more delicate and the harder the packing becomes. A very hard packing with minimum impression force and minimum blanket "give" no doubt provides for the best possible printing result, but demands a most careful makeready of any unevenness which might print weakly.

Makeready should always be made from blanket cylinder to impression cylinder, so that unevenness in the printing plate is not also equalized on the blanket makeready.

By printing a full solid, areas printing weakly are easily determined and are usually made ready by using tissue paper and equalizing down to the lowest sheet in the underlay to prevent showing of edges or markings of glue points. Quite naturally the question of production economy is important and for this reason medium to hard packings are often preferred. Such a packing may be made up of a most suitable combination of