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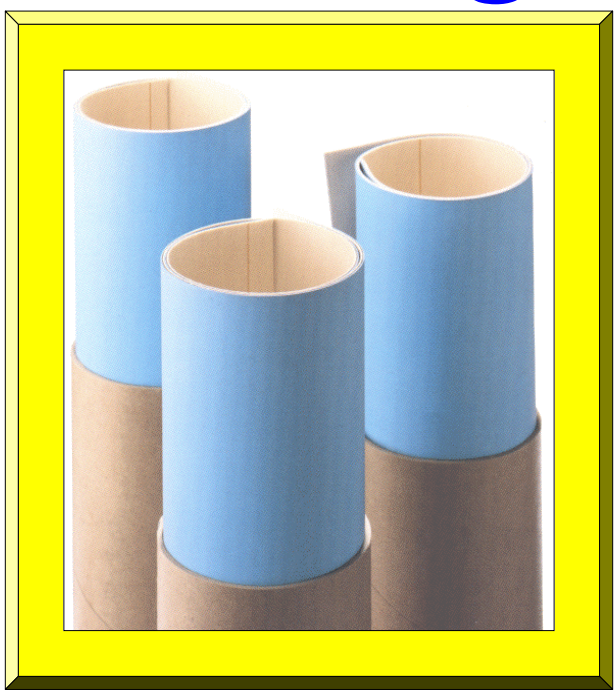
The Role of the Blanket in Offset Printing



Volume XI

The change from the letterpress process to offset brought for the newspaper printer many new "things" to learn. Not only must the printer learn a new printing process and press, he must learn that a product which appears similar to the impression cylinder blanket of the letterpress has little in common with that familiar hard black blanket. The offset blanket has many characteristics, and these include:

Being a shock absorber.
Being ink and water receptive without mixing the two, and without swelling.
Transferring the ink both as solids and dots, clean and sharp without streaking.
Being an impression cylinder when printing blanket-to-blanket.

The blanket must conform to these conditions, while being soaked from the back and face with solvents and water and without coming apart. It must perform these functions at high speeds, with various papers, inks and plates, at often incorrect packing heights and with ink and paper lint build up for long periods of use. The function of the offset blanket bears little resemblance to the functions of its letterpress counterpart. It is therefore different in characteristics.

In order to perform its' functions, the offset blanket has reached a high state of development. The carcass is made from high quality fabrics and laminated together with solvent resistant rubber compounds on very exact machinery. These factors contribute to a relatively long life, which however, is not as long as the life of a letterpress blanket. Even so, some blankets reach 16 million impressions before being taken from the press. However, most blankets are replaced due to damage suffered from web breaks.

There are several different blanket surfaces on the market. These are ground surface (buffed), spread (coated) surface, and a caste surface. All of these can be used on newspaper presses, but never mix them on a unit or units feeding into the same folder. It goes without saying that units feeding into other units in 4 color or spot color work should not only have blankets from the same manufacturer but also the same type of surface (some blanket manufacturers offer more than one type of surface).

Most newspaper blankets have a compressible layer built into the carcass. It is basically air trapped in a rubber layer. Although there are approximately 4 methods of including voids in rubber, all such constructions can be placed into two categories, open cell or closed cell. As implied in the names, open cell layers are composed of interconnecting air cells, as in the common sponge. Closed cell layers are composed of individual cells. Although both types are used, the closed cell structure offers the advantage of retaining its compressibility and smash resistance over a longer period of time.

Although there are many advantages in using compressible blankets, the main reason remains the elimination of the "bulge" in the printing zones which is common to conventional blankets (See Figure 1). This allows using relatively high packing levels for good solids without causing undue dot gain. The advantages of the compressible blanket over the conventional blanket are: increased smash resistance, increased packing latitude and quick gauge recovery after passing through the nips

with the plate and paper. If this recovery is not fast enough the blanket fails to pick up or transfer the ink cleanly. The closed cell compressible blanket excels in this area.

How much compressibility is enough? Although 4 to 5% deflection rates as a compressible blanket, a functional compressibility lies between 5% and 7% with an average of approximately 6%. Over 7%, the blanket tends to print an unsharp dot and, under 5%, generally does not have enough smash resistance.

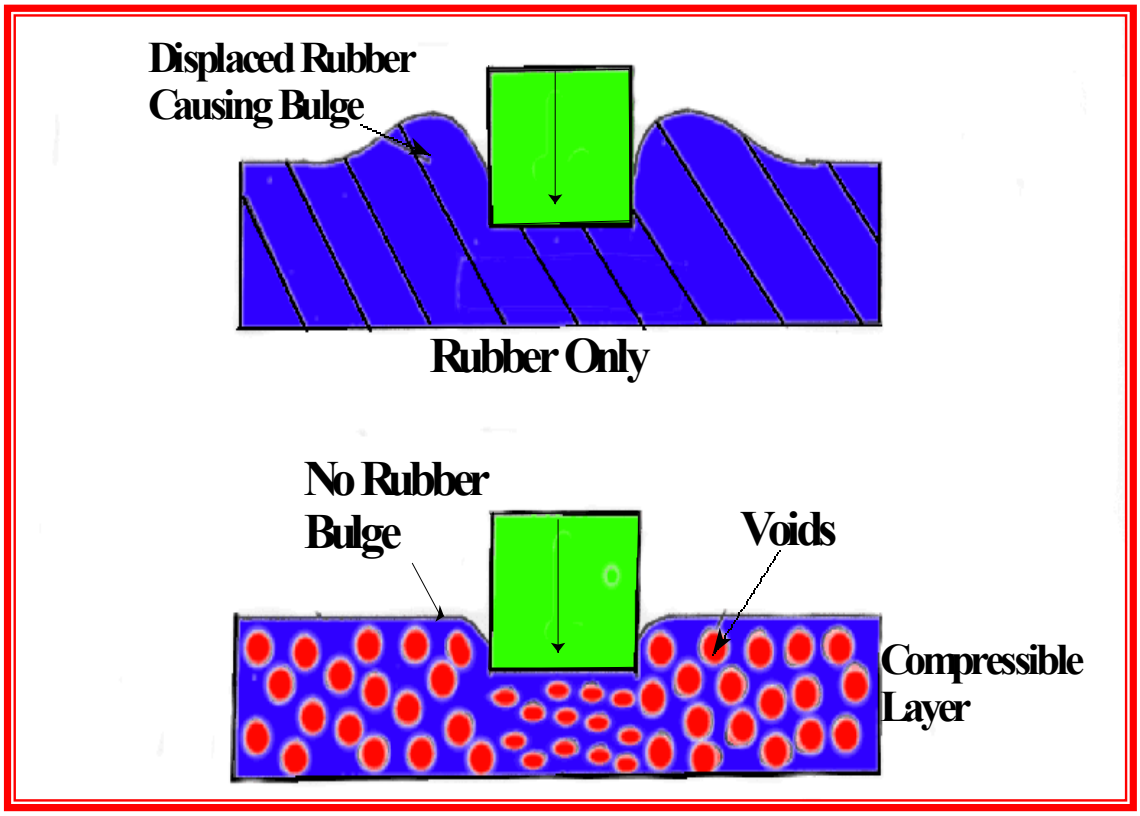


Figure 1 Compressible Layer Function

An excellent compressible layer is necessary for a good blanket, but just as important are the fabrics, which make up the bulk of a blanket. These fabrics, as mentioned, are high quality (no defects) low elongation, high strength and of uniform construction and gauge. This attention to fabric is necessary if a blanket manufacturer is to make an acceptable product. What stable fabrics mean to a printer is a stable blanket, which does not move on the cylinder, maintains its width around the cylinder and does not shrink at the gap.

Shrinking is a word often heard among offset printers in connection with a blanket's loss in thickness. All offset blankets lose thickness and this is inherent in the product. Part of this gauge loss is due to the tightening of the blanket around the cylinder. Also, during printing, air is forced

out of the fabrics and, in some cases, the compressible layer giving a continuing loss of thickness.

To a printer this means that all blankets lose some thickness immediately, called setting in, and then continue to lose thickness throughout the life of the blanket. The initial loss is not only unavoidable but also necessary since during this period the blanket settles in absorbing unevenness in the packing, the press and the blanket itself.

The second stage of thickness loss is the area that blanket manufacturers try to control. Stable fabrics and compressible layers control this to a large degree. What should a printer expect from his blanket in this area? Blankets, which lose 1.5% to 3% of their original thickness, are generally acceptable. Over 4% means an uncontrolled shrinking and causes problems. Most blanket manufacturers and distributors can supply this information.

Blankets should not only be dimensionally stable but also pliable enough to bend around the cylinder and into the gap. The softness of a blanket is dependent upon the fabrics, type of rubber, and production techniques, which vary from manufacturer to manufacturer. When a blanket is too stiff, it causes an increase of thickness at the gap, which increases the "bump" at the gap and the load on the bearers.

A question often asked is "how much torque does your blanket require to print?" As long as the blanket lies flat on the cylinder and does not move on the cylinder, the blanket is tight enough to print. In other words, use no more torque than necessary. Many more problems are caused by over-tensioning than by under-tensioning. Over-tensioning causes shrink at the gap in some blankets and severe over-tensioning can cause the blanket to tear in the gap area.

A printer can see and hear the effects of a loose blanket. An over-tightened blanket only shows the bad effects later. Every press manufacturer uses different tensioning methods and specifies the required torque. In tightening mechanisms using bolts, careful attention must be made that all bolts are tightened evenly and at the same time. Over-tightening on the end bolts may cause the bars to pull off the blanket. On presses with single T-bar tensioning mechanism, the recommended torque should never be exceeded, as the lead end could lose excessive thickness in the gap area.

Careful attention must be given to the height of the blanket over the bearers. For this reason the thickness of the blanket, plate and packing materials are to be measured. All these products have variances, which could lead to an over or under packed blanket. The thickness of every blanket should be measured, as not only blanket manufacturers make mistakes but also the distributors who cut and bar them. In other words, do not take the gauge stamped on the blanket as an absolute. This is especially important when using glued-on packing materials, which stay on the cylinders through several blanket changes. Also be sure to specify the correct blanket gauge when using such packing materials. It must be stated at this point that even the best of blanket manufacturers have a gauge variation in their products. In addition, the use of a suitable blanket micrometer is important. Machinists' micrometers may not be suitable.

The exact blanket height over the bearers depends on several factors:

1. Manufacturer of the blanket.
2. Width and length of the blanket.
3. Bearer height on impression cylinder.
4. Weight of paper.

By far the most important is the blanket. The amount of packing used with one blanket brand is seldom the same as used with another. This is due to the already mentioned factors, such as elongation, compressibility and compressible layer type.

INDICATION OF IMPROPER PACKING

Too much

1. **Premature plate wear.**
2. **Plate cracking.**
3. **Contamination of succeeding inks.**
4. **Paper transport problems.**
5. **Damage to blanket.**
6. **Excessive dot gain.**

Too little

1. **Poor solids.**
2. **Excessive ink and paper piling.**
3. **Paper transport problems.**

Of particular importance is never to mix blankets from different manufacturers on a unit or units feeding into the same folder, as it could cause severe paper fiber transfer problems. In addition, it is best to replace both blankets on a cylinder, at the same time, even when only one is damaged. The difference in height over the bearer from a new blanket to an old one can also cause paper transport problems. The undamaged used blanket could be used in later cases of damage to one blanket of a two-blanket cylinder.

IDENTIFICATION OF BLANKET MANUFACTURERS

Manufacturer	*Color of Stripes on back of Blanket*
DAYCO	YELLOW
SUN GRAPHIC	BROWN
RAPIDTECH	BLUE
POLYFIBRON	DOUBLE GREEN
REEVES	BLACK
DYC	GREEN
DAVID M	RED/WHITE