

**SOMANY INSTITUTE OF
TECHNOLOGY AND
MANAGEMENT,
REWARI**

PRINTING

TECHNOLOGY

BASICS OF PRINTING

PROCESS

UNIT-4

Rollers in Offset Printing Machines

Synthetic rubber is used in roller manufacture: a complex mix of natural rubber and various chemicals that obtain their stability and elasticity through the vulcanization process. It is the raw rubber that gives the rubbery material its basic characteristics. The vulcanization agents are added to this for the subsequent vulcanization process. Plasticizers (fluid oils) play a major role as they – along with the extenders and the vulcanization agents – determine the subsequent degree of hardness of the material. The more plasticizers are added, the softer the rubber after the vulcanization process.

Shore Hardness-The Shore hardness of a roller determined with a Shore meter designates the resistance against penetration of a needle taking the form of either a conic section (Shore A) or a point (Shore D), pressed with a defined force (1 kp) for a period of three seconds against the rubber surface. Soft rollers are measured with Shore A, and hard rollers with Shore D.

Inking rollers must be adjusted to be oil-friendly (or oleophilic). In an inking system with conventional inks, rollers of Shore A hardness between 30° and 35° are used. For UV inks, rollers with Shore A hardness of 25° and between 40° and 45° are used.

Dampening rollers should be water-friendly (hydrophilic). For alcohol dampening systems, Shore A hardness of between 25° and 30° is suitable. In direct dampening systems, hard rubber rollers are used.

Roller Care

Rollers should be cleaned thoroughly with a roller wash especially at the end of every day's work. This will prolong the life of the roller and minimize the hardening effect.

Clean the rollers frequently before the ink starts to dry. Accumulation of dried ink film will cause Glazing.

Rollers should never be left for long periods in contact because " flats" can form on the soft rollers. Moreover if wash-up has not been completely clean the rollers can stick at contact points with the risk of pieces being top of the surface of the roller when the machine is turned.

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Roller Care

How to maintain your rollers in top condition ?

- Rollers should be cleaned thoroughly with a roller wash especially at the end of every day's work. This will prolong the life of the roller and minimize the hardening effect.
- Clean the rollers frequently before the ink starts to dry. Accumulation of dried ink film will cause Glazing.
- Rollers should never be left for long periods in contact because " flats" can form on the soft rollers. Moreover if wash-up has not been completely clean the rollers can stick at contact points with the risk of pieces being top of the surface of the roller when the machine is turned.
- Many rollers become useless because of longtime and/or improper storage. Spare rollers should be rotated with the rollers on the press, at least every six months. This acts as a sort of seasoning, relieving stresses that are inbuilt in roller. The replaced rollers should be cleaned thoroughly and after dusting them with talcum powder and covering them up with the black or brown paper, should be

rested horizontally on the journals. The rubberized portion should never contact any other surface. The storage place should be away from direct sunlight and heat.

- While printing smaller jobs on larger machines printers tend to release ink only to cover the print area. This causes the sides of the rollers to run dry generation high temperature and causing heavy wear on the roller ends due to abrasion.
- While fitting the bearings, take care that you do not bend or damage the journal ends by hammering or forcing. Check up the journal ends/bearing seats, sockets and brackets for wear or damage.
- Use the correct technique for mounting the hose on a Dampening Roller. Excessive force may damage the roller by tearing the soft roller from the metal core.
- To avoid "bulging" or "belling" of dampening Rollers place a disc/collar of fibers/plastic, with a slightly smaller diameter than the rubber, at both rubber ends and then sew on the hose ends. Any pressure or pull exerted now will be on the disc and not on the rubber sides.

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• BASIC PRINTING FAULTS

- 1, white

Description: A part of the warp or weft yarn is turned over or moved to the front and back of the fabric, and the pattern appears to be traced after being scratched.

Analysis of the cause: Most of the rickets are caused by poor penetrability of the colorant and improper handling after printing (uneven tension, etc.).

- 2, uneven printing color (spot)

Description: A part of the print becomes a spot like the shape of a sand fish skin.

Analysis of the cause: The rickets occur mostly when the viscosity of the color paste is not appropriate, the mesh mesh is improperly selected, or the patch is uneven.

- 3, bleed (open)

Description: The color of the printed pattern oozes out, the outline of the pattern is not clear, and the color is blurred.

Analysis of the cause: Due to the low viscosity of the color paste, the concentration of the dye is extremely concentrated, the amount of printing suction is too much, or the amount of the moisture absorbent is large.

- 4, color stains (color)

Description: The color of the printed pattern is contaminated by stains caused by other parts.

Analysis of the causes: Most of them are not cleaned on the printing platen, and the drying after printing is not enough to overlap each other or the fabric and the fabric are in contact with each other in the steaming process. In Japan, some factories wash thoroughly under the condition of ropes by adjusting the tension of the fabric.

- 5, double version of the color difference (smooth uneven)

Depiction: The color of the fabric is shown in a certain interval in the horizontal direction.

Analysis of the cause: The rickets are often caused by the screen frame, poor blade installation or uneven squeegee.

- 6, lack of color paste (de-slurry)

Description: The lack of color in the pattern.

Analysis of the reasons: usually in the case of color paste replenishment is not timely, the squeegee pressure is not uniform, the squeegee hardness is improper, the squeegee relay failure, the surface of the printing platen is uneven, the viscosity of the color paste and the slurry are not suitable.

- 7, the flower version of the connector is bad (printed)

Description: The patterns at the flower plate overlap or do not match (disengage).

Analysis of the cause: Due to poor adjustment of the conveyor belt or improper adjustment of the Taiwan version of the rules, affecting the accuracy of the flower position.

8, the flower version is misplaced (set, set is not allowed)

疵 Describe: Printed products with misplaced patterns.

Analysis of the causes: Most of them occur when the flowers are not accurate, the carving is poor, and the patches are bad.

9, the frame mark (frame print, take off)

Description: The printed part shows an unusual streak of the shape of the frame.

Analysis of the reasons: mostly due to poor conveyor belt, poor installation of the stencil frame and other reasons.

10, bending (flower shape skew)

Description: The pattern is inclined or curved for the warp and weft of the fabric.

Analysis of the cause: Usually occurs when the printed fabric (silk) itself has a skew or a poor seam or a skew of the platen.

11, color point

Depiction: Small spotted color spots.

Analysis of the cause: Usually occurs in the case where there is undissolved dye in the paste or impurities are attached.

12, friction stain (drag)

Defective description: contact with foreign matter when the printed pattern is not sufficiently dry, rubbing the color of the pattern portion and contaminating the defects formed by other parts.

Analysis of the cause: This defect occurs when the printed fabric is insufficiently dried and is dragged or touched due to inattention.

13, dye splash (screen bounce, splash, slurry contamination)

Description: The stain of the color point caused by the splash of the color paste.

Analysis of the reason: This defect is mostly caused by the processing speed of the drum printing being fast, the improper printing of the screen printing, and the viscosity of the color paste being inappropriate.

14, the tail of the yarn contamination

Description: The yarn-like contamination caused by the tail of the printed silk (cloth) on the printed fabric.

Analysis of the cause: Due to poor handling of the yarn of the printed silk (cloth).

15, deep side (medium depth, deep and shallow sides)

Depth description; that is, the hue or depth of the two sides and one side of the cloth and the middle of the cloth are different.

Analysis of the reasons: due to poor fabric bleaching engineering or poor screen frame, squeegee installation, uneven squeegee pressure and improper padding or color development.

16, the joint color (seam color)

Defective description: the seam formed by the color of the fabric or the joint on the cloth surface showing the printed interlining.

Analysis of the cause: usually occurs when the joint of the fabric or printed lining is too large or the seam overlap is too large.

17, printing water stains

Depiction: A stain or spot caused by water droplets.

Analysis of the cause: This is due to the condensed water or splashing of water on the fabric for a period of time before the end of the steaming of the fabric.

18, scraper strip flower

Description: the strip-shaped contamination in the radial direction in the drum printing.

Analysis of the cause: The rickets occur when the pressure of the printing blade is insufficient or impurities are attached.

19, printing wrinkles

Description: A strip-shaped unprinted portion that appears as a result of wrinkles in the printed fabric.

Analysis of the causes: Most of them occur because of the wrinkling of the printed fabric, the poor seam, the excessive tension of the patch, and the wrinkling of the printed lining.

20, the color is not clean or poorly dyed

Description: The effect of whitening, color drawing or anti-dye printing is not clear.

Analysis of the cause: It occurs mostly under the conditions of anti-proof, discharge dyeing, color paste, squeegee pressure or hair color (steaming).

21, color paste cracking

Description: The pattern of the pattern caused by the cracking of the color paste after printing.

Analysis of the cause: mostly due to improper handling after printing or improper viscosity of the paste.

22, rope streaks

Description: The streaks formed by the traces of the cords or rods used in the steaming process on the printed fabric.

Analysis of the cause: It occurs when the temperature of the steaming project is too high or the finishing temperature is too low.

23, rope color strip

Description: Discoloration or contamination caused by the contact of the printed cloth with the rope or rod in the steaming project.

Analysis of the cause: Mostly caused by vapor condensation on the rope or rod.

24, remove the needle or drop the scar

Defective description: The rickets caused by the needle or the cloth of the tenter falling off or the inside is abnormal.

Analysis of the cause: Due to the poor needle punch or fabric of the tenter, the track is not normal, and the width of the fabric is abnormal.

25, white spots

Description: A defect caused by the failure to print a paste due to a part of the pattern.

Analysis of the cause: Most of the foreign matter on the screen film or the yarn knuckles on the fabric and foreign matter make the color paste not printed.

26, crack

Defective description: When the fabric is stretched or the fabric is bent, the white background is exposed.

Analysis of the cause: Occurs when the color paste viscosity, screen mesh, and squeegee pressure are not properly caused to cause poor penetrant penetration.

27, ripples (cloud spots)

Description: A ripple on the printed pattern.

Analysis of the cause: occurs when the mesh groove of the screen or the groove of the printing cylinder overlaps with the yarn structure of the printed fabric to cause in