

Installation of Tapes

Plastic Tapes

SCOTCH® SUPER 33+, SCOTCH® 35, SCOTCH® SUPER 88, SCOTCH® 22, SCOTCH® 710, TEMFLEX™ 1500, TEMFLEX™ 1300, SCOTCH® 50

- Wind the tape with sufficient tension so that it can conform to the surface. When the tension is right, the tape narrows down to 5/8 of its original width, i.e. from 15 mm to 9.5 mm and from 19 mm to 12 mm.
- Wind individual wraps so that a half of the previous wrap is overlaid. Create a smooth cylinder-shaped wrapping. Apply the last wrap of the tape without any tension so that your wrapping does not unwrap.
- If you are applying the tape to a cone-shaped object, start at the end with small diameter and finish at the big diameter end.
- Use more layers of the tape for places with higher mechanical stretch.
- On uneven surfaces, such as of LV splices, cable lugs etc., use first a filling rubber tape to fill out the irregularities e.g. Scotchfil for voltage rated up to 1kV, Scotch® 2228, Scotch® 23 or Scotch® 130C for higher voltages.

Rubber Tapes and Tapes for High Voltage

SCOTCH® 2151, SCOTCH® 23, SCOTCH® 13, SCOTCH® 2228, SCOTCH® 130C

- You can apply the tape directly from the roll or you can cut or tear strips. This will be especially useful when winding insulation on cores of a multicore cable.
- Remove the liner and tear it off continuously when unwinding. Always tear off the beginning of the tape so that it narrows down.
- Put the tape roll in such a position that when you are winding, the tape gets tight and does not unwind freely. This is not valid for Scotch® 2228, which has to be wound with the mastic inside.
- Stretch the tape a lot, the more, the higher voltage you are to insulate. It should get narrowed down to at least $\frac{3}{4}$ of the original width - i.e. from 19 mm to 14.5 mm. Apply the tape at the edge of its strength and with a sufficient overlay of the original cable insulation at places of high electrical load. If the tape snaps, fix the end and continue winding. Mainly, it is important that there is no air bubble or gap.
- Wind individual wraps so that a half of the previous wrap is overlaid. Create a smooth cylinder-shaped wrapping.

Always apply the Scotch®13 semi-conductive tape with the lettering up for a possible future check.

VM TAPE, SCOTCHFIL™

For repairs of damaged plastic cable sheathing. Insulates, seals and makes a sheathing in one step.

1) A very damaged sheathing

- Clean the damaged spot, remove the loose ends of the sheathing.
- If an insulation of a lead wire is damaged, repair the insulation first, e.g. with Scotch® 23 or Scotch® 2151.
- If more cores have been damaged, it is more appropriate to make a complete splice. Using a 3M compound splice it is not necessary to disconnect cores that are not damaged, or to repair core insulation.
- Fill the bigger holes caused by the missing sheathing out with a filling tape, e.g. Scotchfil™.
- Wrap the filling tape around the entire damaged area of the cable.
- Wrap the cable with the VM tape so that it overlays at least 40 mm of the undamaged cable sheathing.

2) A slight damage of a cable sheathing caused by incising, scorching etc.

- Clean the damaged spot and the adjacent parts of the cable. Check if the cable insulation is undamaged.
- Wrap the damaged spot and the adjacent cable parts with Scotch® VM. Apply with a gentle tension and with a half overlay of the layers.

3) Damaged insulated AES lead wires and similar

- Clean the damaged spot and the adjacent parts of the cable.
- Wrap the damaged spot and the adjacent cable parts with Scotch® VM. Apply with a gentle tension and with a half overlay of the layers.
- Make at least two layers.

4) Damaged insulated ADX, SAX and similar HV lead wires

- Clean the damaged spot and the adjacent parts of the cable.
- Wrap the damaged spot and the adjacent cable parts with Scotch® VM. Apply with a gentle tension and with a half overlay of the layers. Make four layers of the tape.

SCOTCH® 2220, SCOTCH® 2221

- Apply the tapes with a gentle tension. Overlay half of the previous wrap so that the wrapping surface is as smooth as possible.
- Apply Scotch® 2220 with the shiny silver side up and do not join more parts to it.
- Follow the instructions for a HV splice or a termination mounting.

SCOTCH® 2000

- High tack. When applying be careful so that it does not bond where you do not want it.
- When removed and used again the adhesion is much lower.
- Can be torn by hand lengthwise and also along grooves. The resulting tear is always straight.

SCOTCH® 401, SCOTCH® 404

Store the tapes in their original packaging and take them out only before you intend to use them. Keep them and your working place clean. The tapes you unpack but do not use cannot be stored any more.

- Apply them with a gentle tension so that the tape conforms to the surface and does not cause irregularities.
- There must be no air bubbles and gaps in the wrapping.
- Apply the tape so that individual wraps overlay a half of the previous ones.
- Follow the instructions for a splice or a termination mounting.

Other Tapes

SCOTCH® 9545

- Apply the tape with sufficient tension.
- Because of its high mechanical strength it is recommendable to cut the tape rather than tear.
- Can be written on with a pen, a marker, ink or can be printed

SCOTCH® 45 BK

- Apply the tape with sufficient tension.
- High tack. When applying be careful so that it does not bond where you do not want it.
- When removed and used again the adhesion is much lower. The tape is not designed for multiple use.
- To achieve the maximum strength of the loop, make sure that the tape is always overlaid in its entire width and in sufficient length. Also apply pressure to the bonded spot. The maximum strength of the bond is achieved within several hours and does not change much later.
- If you have to make more loops, make sure the pitch of the spiral is the minimum possible so that the tape is overlaid as much as possible, and again apply pressure.

ARMORCAST™

It is used for insulation filled cables as the replacement of lead vessel together with a shielding sleeve and lever spring, as a replacement of outer armor instead of cast iron moulds, as the improvement of the mechanical protection for any cable and also as a sheathing reinforcement or a protection sleeve replacement.

- First, clean the part of the cable that has been damaged and its surrounding. Then, sand this part gently and clean the sanding. Apply Temflex™ or Scotch® Super 88 over the part you have treated so far so that the entire cable sheathing achieves the same electrical parameters.
- Open the package of Armorcast™ tape and fill it with water. Homogenize it by rolling and shaking. The resin is reactivated after about 15 seconds. The arisen substance is flexible, rubber-like and adhesive and bonds to all materials. Now you can apply it to the desirable spot with an overlay.
- In dependence on the length of the damaged part you can apply the wrapping in more layers. You do not need any special equipment for the easy

and simple installation of the tape. The glass filament reinforced material is conformable when applied, it sets in 30 minutes and it is completely hard in 24 hours.

Careful! When applying Armorcast™ always use the supplied gloves. The spots soiled with resin can only be cleaned before it sets. The best is to use 3M™ Citrus Cleaner. When the resin sets, it is extremely difficult to remove it.

SCOTCHFLEX™ (HOOK & LOOP)

- It is fixed by overlaying. The strength of the bond depends on the length of the overlay.
- Can be used many times.
- It can also be bonded to felt and similar fabrics (e.g. to the car trunk upholstery).

Tapes for High Temperatures

SCOTCH® 70

To create an oil barrier in splices and terminations of insulation filled cables.

- In contrast with black tapes it is applied with a small tension only (elongation from 10 to 100 %).
- When using the tape, it is necessary to keep your hands clean and the surface where you are applying the tape must be clean and grease-free.
- Remove the liner and tear it off while unwinding.
- Put the tape roll in such a position that when you are winding, the tape gets tight and does not unwind freely.
- The last wrap of the tape has to be applied without any tension so that the wrapping does not unwrap.
- Wind individual wraps so that a half of the previous wrap is overlaid. Create a smooth cylinder-shaped wrapping.

SCOTCH® 77

Scotch® 77 can be used to protect cables and cable fittings against fire and electric arc, which is cheaper, faster and easier than any other way, and mainly, there is no need for future checks and repairs.

- Apply the tape so that half of the previous wrap is overlaid. Stretch it gently so that the surface is smooth, with no irregularities and so that it conforms to the cable shape.
- When you are starting a new roll, start with a 150 mm overlay of the previous layer.
- Scotch® 77 is adhesive-free. Therefore, it is necessary to fix its beginning and end. The best solution is to apply two layers of Scotch® 69 wrapping.

SCOTCH® 27, SCOTCH® 69

Scotch® 27 uses a thermosetting rubber adhesive. It means that the adhesive sets after the tape has been exposed to high temperature for some time. Then it cannot be removed. Scotch® 69 uses a thermosetting silicone adhesive. When the adhesive is cured, its resistance to solvents and thinners increases.

- Apply the tape so that half of the previous wrap is overlaid. When winding, keep the tape stretched so that the surface is smooth, with no irregularities and so that it conforms to the cable shape.

MGO Tapes

MGO 1316, MGO 1317

- Use the tape for flat surfaces only.
- The surface has to be cleaned and cleared of grease before applying the tape.
- Remove the liner just before applying the tape.
- Do not expose the adhesive to UV light.
- The material which is to be fixed with the magnet has to be ferromagnetic. The best results are achieved when its surface is uncoated.
- If the material is not magnetic, bond pieces of the tape to it against each other (make sure the orientation of the tape is the same).
- Better result (higher adhesion) is achieved by applying several small areas rather than one large area.

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