

Current Trends in Tape Products



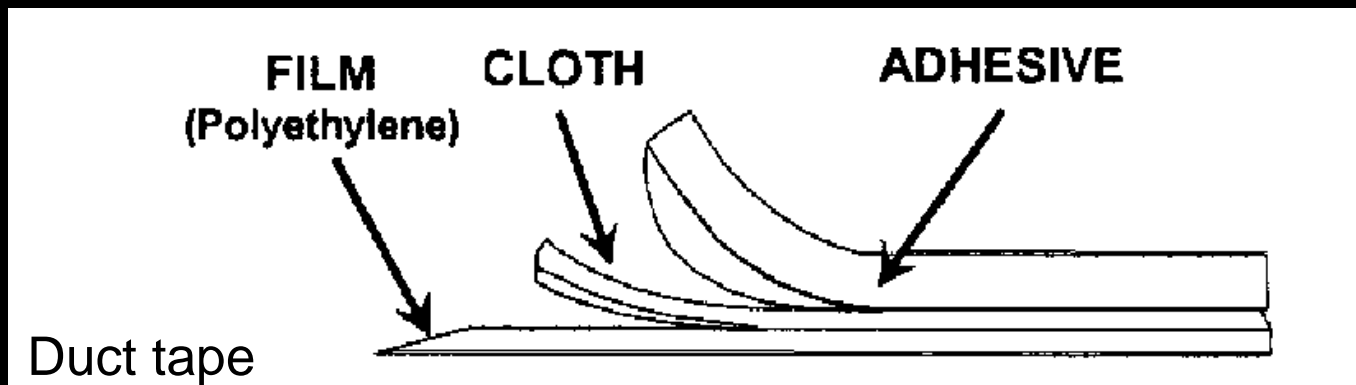
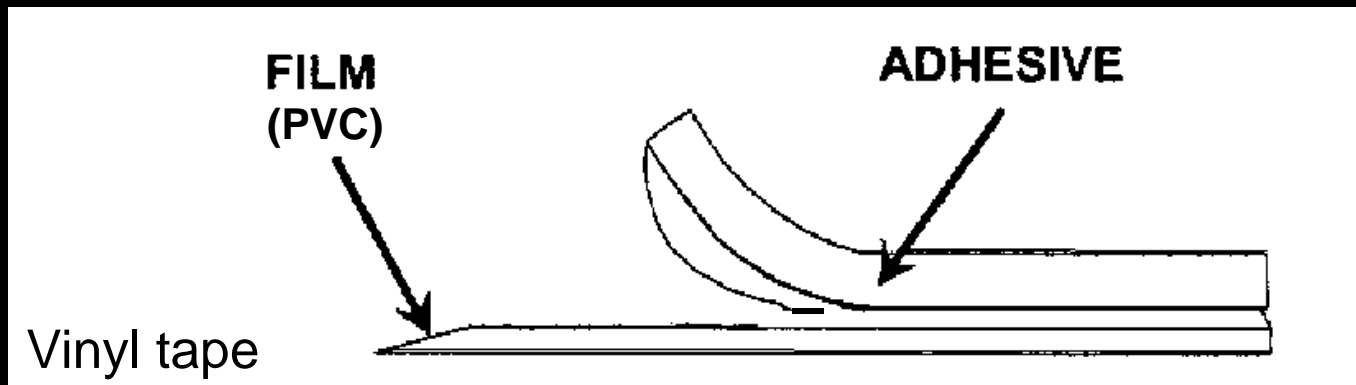
Jenny Smith

Missouri State Highway Patrol Crime Lab

Major U.S./Canada Tape Manufacturers

- 3M
- Shurtape – was Shuford Mills
- Intertape Polymer Group (*bought American Tape, Tesa and Anchor Continental*)
- Berry – formerly Tyco, Covalence, Kendall-Polyken, Nashua and National)

Basic Tape Construction



Tape Construction

Release coat 

Low surface energy materials if present
i.e, carbamates

Backing 

PP, PE, PET, PVC, cellophane, cellulose acetate, cloth, crepe, laminants

Primer 

rubber, PET, PP, EMA, EVA, PE, starch, polyamides, etc. (a compatible polar material)

Reinforcement 

cloth, scrim, paper, non-wovens, glass fabric

Adhesive 

Rubber/resin systems, acrylics, silicones, fillers, crosslinkers, stabilizers

2 Rules.....

1. Not all tapes within a class are the same.
2. Change is constant.

Composition changes constantly in response to market fluctuations.

- Rubber
- Petroleum
- Labor
- Foreign competition

Duct Tape Components

Backing: PE, EMA, EVA, CaCO₃, Mica, Al, carbamates

Scrim: different weaves- might be all cotton, cotton/polyester or all polyester, different fiber shapes, sizes, delusterant

Adhesive: natural rubber, syn. rubber, SIS, SBS, TiO₂, dolomite, ZnO, clay, talc, calcite, cross linkers, stabilizers

Variability of Duct Tape Manufacturing

Can always find differences between duct tapes manufactured at different plants.

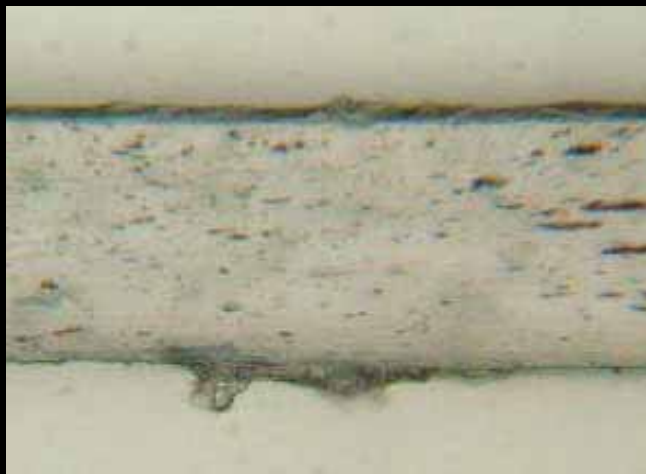
Can often find differences between batches of duct tapes manufactured at the same plant

Can sometimes find differences between rolls of duct tapes manufactured within the same batch.

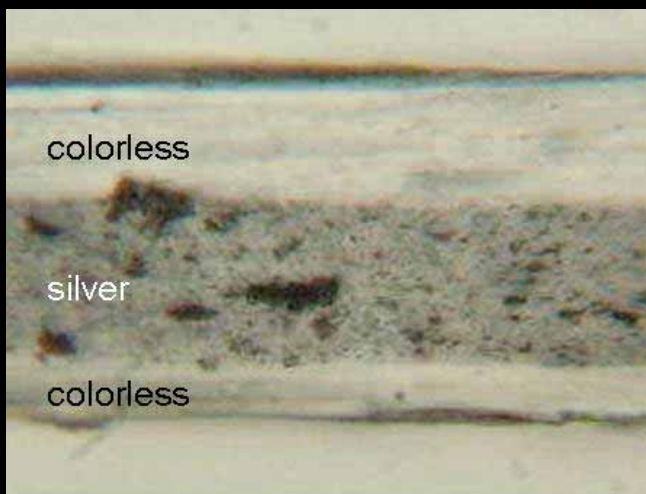
Market trends – Duct Tape

- Duct tape film backings – trend toward multi-layer
- Tie layer – trend toward low melt point PE
- Scrim fabric – trend to knitted fabric, Weft Insertion
- Adhesive – global rubber market fluctuations

Lots of variables
in number of layers
and content.



One layer
PE + Al flakes



Three layers
Al in middle layer

Top clear layer of extruded films may have talc or mica

Tie layer in co-extruded duct tapes

EMA = ethylene methylacrylate

EVA = ethylene vinyl acetate

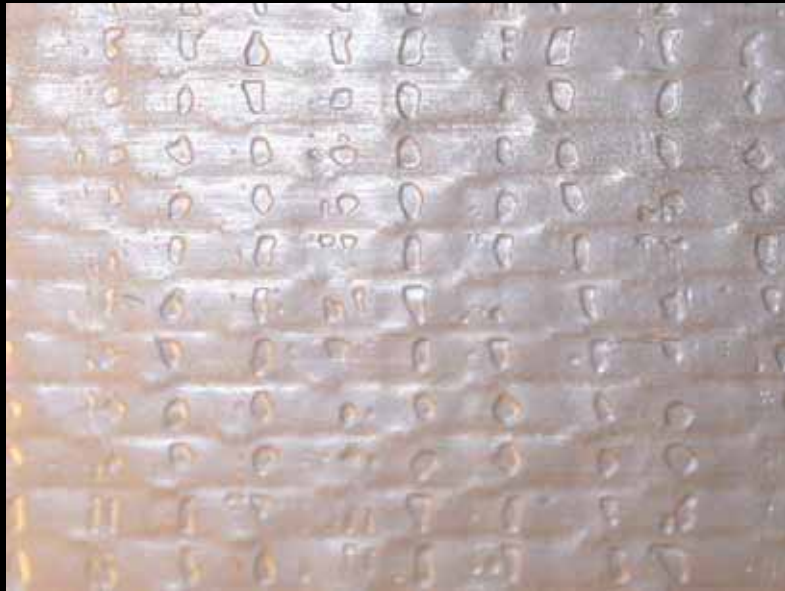


View of underside of a duct tape film; adhesive and scrim removed showing the fabric imprint in the tie coat.

Moving toward NO tie layer or low melt point PE due to lower cost.

Can raise temperature in coating process to soften PE giving same properties of EMA and EVA.

Co-extruded vs. Laminate



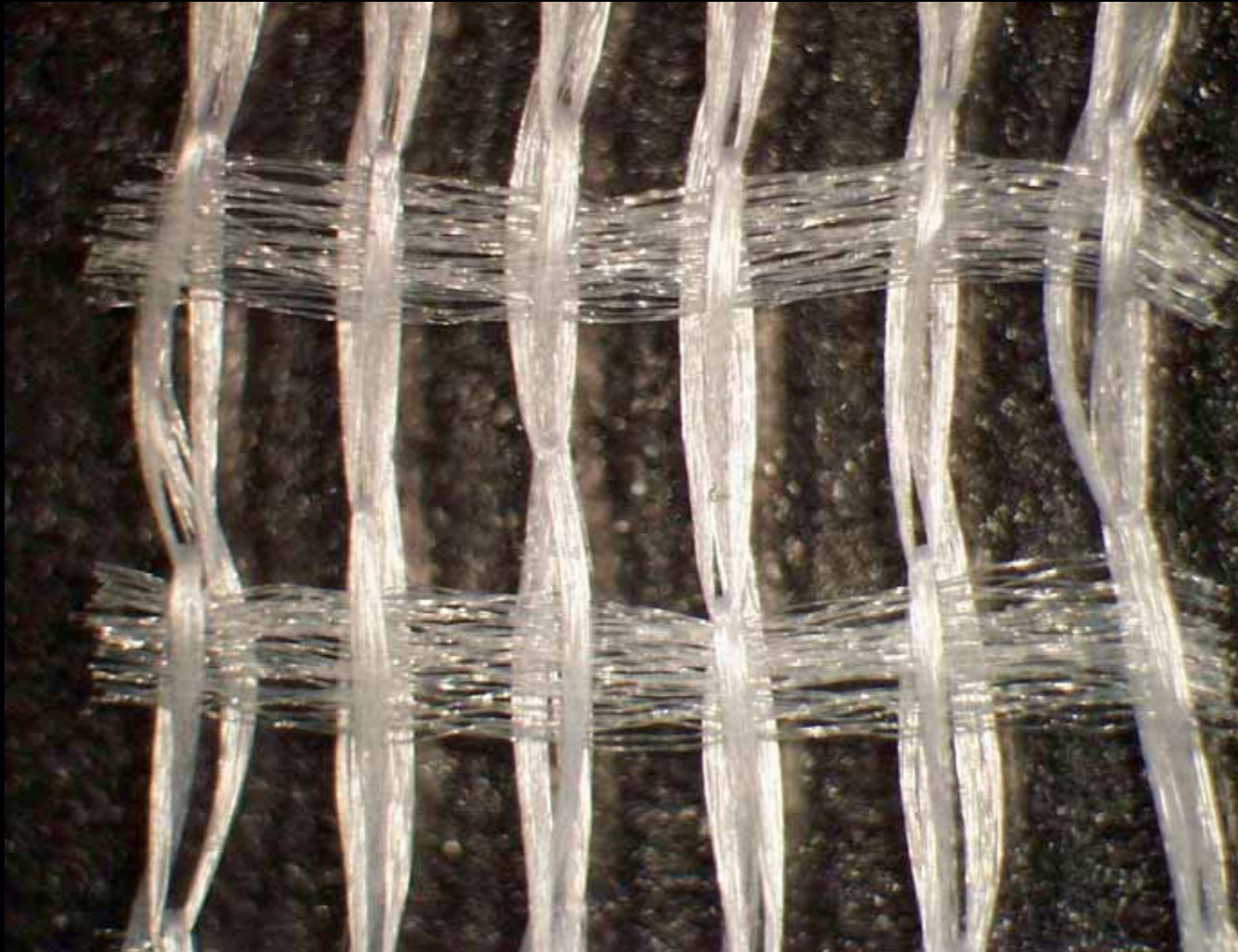
We see more of the co-extruded film in current market

These were typical weaves before the mid 90s

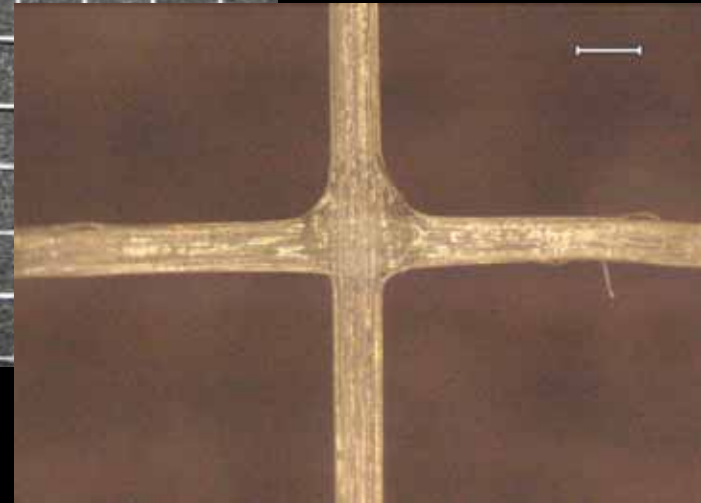
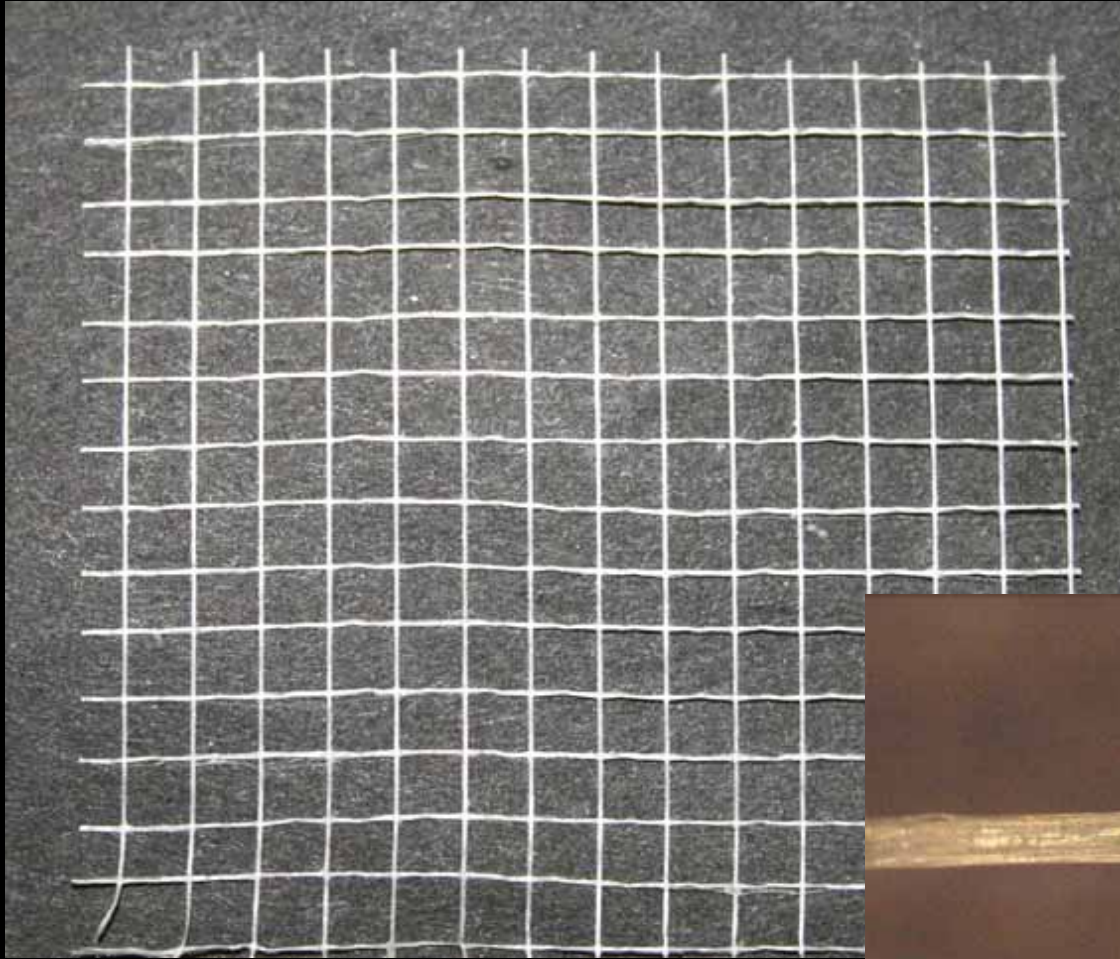


Scrim of Manco "Duck" brand 1998 - Weft Insertion

Knitted fabric



Heat-bonded Polyester



IN GENERAL....

In the 1990s it was more common to see kaolin clay in adhesives.

Now it is less common. See lots of CaCO_3 .

Market Trends – Vinyl Tape

- PbCO_3 removed from US produced backings.
- Phthalates, vinyl and chloride have lost favor, substitutes being sought.
- Might see more water based acrylics in adhesives.

PbCO_3 was common stabilizer in electrical tape until 2002

Has been replaced by Ba and Zn in US and Canadian plants.

Vinyl, Chloride and Phthalates has lost favor due to health hazards.

Europe is beginning to replace PVC tape with "Fleece tape", has a felt backing.

More generalities.....

In the 1990s it was uncommon to see inorganic fillers in clear packaging tape adhesives

Not uncommon now to see CaCO_3 .

Compared to 1995, the production of tape in the US has decreased while Asian production has increased.

The only constant in tape production is that you can expect change.