ITW Thermal Films

# *How To Identify Label Material and Select Correct Ribbon Formulation*

## PAPER

### Coated Paper

*Applications:*

1. Apparel Tags
2. Asset Tracking Labels
3. Bin Labeling
4. Carton Labeling
5. Compliance Carton Labeling
6. Pallet Labeling
7. Receiving Labels

*Key Characteristics:*

1. Dark streaks *are* created if scratched with gold jewelry
2. Tears in both directions very easily

*Recommended Ribbon Formulations:*

1. W90 Resin Enhanced Wax
2. M95 Midrange Resin/Wax (for higher heat requirement & highest durability)
3. R-Series Premium Full Resin (for highest heat requirement & highest durability)

### Uncoated Paper

*Applications:*

1. Receiving Labels
2. Pallet Labels
3. Carton Labels

*Key Characteristics:*

1. Dark streaks *are not* created if scratched with gold jewelry
2. Tears in both directions very easily
3. Good for low to moderate speed printers

*Recommended Ribbon Formulations:*

1. W90 Resin Enhance Wax
2. M95 Midrange Resin/Wax (for higher heat requirement & higher durability)
3. R-Series Premium Full Resin (for highest heat requirement & highest durability)

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## FILMS

### Abreviations

- PO - polyolefin (includes PE & PP)
- PE – polyethylene
- PP – polypropylene
- BOPP – biaxially oriented polypropylene
- OPP – oriented polypropylene
- PS – polystyrene
- PET – polyester
- V – vinyl (also called PVC)
- SRV – semi-rigid vinyl
- FV – flex vinyl
- CA – cellulose acetate
- HDPE – high density PE (polyethylene)
- MDPE – middle density PE (polyethylene)
- LDPE – low density PE (polyethylene)
- LLDPE – linear low density PE (polyethylene)
- MD – machine direction
- TD – transverse direction; same as CD
- CD – cross direction; same as TD

### Glossary

- Polymer – repeating chain, chemical units
- Orientation – polymer chain alignment by stretching
- Non-oriented – randomly oriented polymer chains; no order
- Monoaxial Orientation – polymer chains are oriented in one direction; typically the machine direction (MD)
- Biaxial Orientation – polymer chains are oriented in both directions – (MD) and cross-direction (CD) or transverse
- Cast – polymer solution is flowed or cast onto a carrier web. The carrier web is discarded during the manufacturing process and the cast film remains
- Extrusion – polymer solution or hot thermo plastic material is forced through a narrow opening or die under pressure, forming a continuous sheet of film
- Co-extrusion – extruding multiple layers, one on top of the other forming a composite structure
- Print Treated – a thin top-coating applied at manufacturing
- Corona Treated – an in-line, high energy, electrical discharge that alters the surface's electron charge, making it more ink receptive

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**Polyolefin (PO – includes PP & PE)**

*Applications:*

1. Apparel Tags
2. Lumber Tags
3. Nursery Tags
4. Asset Tracking Labels
5. Bin Labeling
6. Carton Labeling
7. Compliance Carton Labeling
8. Pallet Labeling
9. Patient ID Labels
10. Receiving Labels
11. Shelf Labels
12. Drum Labels

*Key Characteristics:*

1. Feels somewhat waxy
2. Feels soft and squeezable
3. No smell
4. Stretches in both directions
5. Excellent solvent resistance
6. Good shrink resistance
7. Floats in water

*Recommended Ribbon Formulations:*

1. W90  Resin Enhanced Wax
2. M95  Midrange Resin/Wax (for higher heat requirement & more durability)
3. R-Series  Premium Full Resin (for highest heat requirement & highest durability)

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**Polyethylene (PE)**

*Applications:*

1. Apparel Tags
2. Lumber Tags
3. Inventory bin marking labels
4. Recyclable shrink wrap labels
5. Patient care tracking
6. Test tube/vial labels
7. Horticulture Labels

*Key Characteristics:*

1. No smell
2. Stretches in both directions
3. Excellent solvent resistance
4. Good shrink resistance
5. Floats in water

*Recommended Ribbon Formulations:*

1. W90 Resin Enhanced Wax
2. M95 Midrange Resin/Wax (for higher heat requirement & higher durability)
3. R-Series Premium Full Resin (for highest heat requirement & highest durability)

**Polypropylene (PP)**

*Applications:*

1. Asset Tracking Labels
2. Bin Labeling
3. Carton Labeling
4. Compliance Carton Labeling
5. Lumber Tags
6. Nursery Tags
7. Pallet Labeling
8. Patient ID Labels
9. Shelf Labels

*Key Characteristics:*

1. Surface is hard and rigid
2. Feels somewhat waxy
3. No smell
4. Stretches in both directions
5. Floats in water
6. Excellent solvent resistance
7. Good shrink resistance
8. While burning, the flame will appear yellow

*Recommended Ribbon Formulations:*

1. W90 Resin Enhanced Wax
2. M95 Midrange Resin/Wax (for higher heat requirement & higher durability)
3. R-Series Premium Full Resin (for highest heat requirement & highest durability)

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**Kimdura (BOPP)**

*Applications:*

1. Apparel Labels
2. Bin Labeling
3. Receiving Labels
4. Shelf Labels
5. Drum Labels

*Key Characteristics:*

1. No smell
2. Stretches a little
3. Tears into layers with above average effort
4. Floats in water
5. Excellent solvent resistance
6. Good shrink resistance
7. If it is smudgeproof kimdura, Scotch Tape removes topcoat

*Recommended Ribbon Formulations:*

1. W90 Resin Enhanced Wax
2. M95 Midrange Resin/Wax (for higher heat requirement & higher durability)
3. R-Series Premium Full Resin (for highest heat requirement & highest durability)

**Tyvek (PO ⁄ PE)**

*Applications:*

1. Furniture Labels
2. Pillow/Mattress Labels

*Key Characteristics:*

1. No smell
2. Stretches a little
3. Tears into layers
4. Floats in water
5. Spun appearance

*Recommended Ribbon Formulations:*

1. W90 (for barcodes)
2. M95 (for higher heat/durability requirement and for letters/characters)

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**Semi Rigid Vinyl (SRV)**

*Applications:*

1. Bin Labeling
2. Chemical Drum Labels
3. Shelf Labels

*Key Characteristics:*

1. Smell of vinyl is noticeable; slight "shower curtain" smell
2. No stretch
3. Tears easily in jagged lines
4. Poor solvent resistance
5. Fair shrink resistance
6. Sinks in water
7. Vinyl will burn only at the source of the flame

*Recommended Ribbon Formulations:*

1. W90 Resin Enhanced Wax
2. M95 Midrange Resin/Wax (for higher heat requirement & higher durability)
3. R-Series Premium Full Resin (for highest heat requirement & highest durability)

**Flex Vinyl (FV)**

*Applications:*

1. Bin Labeling
2. Chemical Drum Labels
3. Shelf Labels

*Key Characteristics:*

1. Smell of vinyl is clearly noticeable; strong "shower curtain" smell
2. Stretches
3. Tears
4. Poor solvent resistance
5. Good shrink resistance
6. Sinks in water

*Recommended Ribbon Formulations:*

1. W90 Resin Enhanced Wax
2 M95 Midrange Resin/Wax (for higher heat requirement & higher durability)
3 R-Series Premium Full Resin (for highest heat requirement & highest durability)

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**Polystyrene (PS)**

*Applications:*

1. For applications where a clear, no-label look is required

*Key Characteristics:*

1. Surface is hard and rigid; appears glass-like
2. No smell
3. No stretch
4. Tears easily
5. Outstanding pre-print
6. Sinks slowly in water (poke it down)
7. Poor solvent resistance
8. Good shrink resistance
9. Burns quickly; while burning odor smells fruity; flame is orange and sputters
10. When squeezed into a ball the label will crinkle
11. Tin-like sound when shaken

*Recommended Ribbon Formulations:*

1. M95 Midrange Resin/Wax (for higher heat requirement & higher durability)
2. R-Series Premium Full Resin (for highest heat requirement & highest durability)

**Polyester (PET)**

*Applications:*

1. Automotive VIN Labels
2. Asset Tracking Labels
3. Chemical Drum Labels

*Key Characteristics:*

1. No smell
2. Surface is rigid and hard
3. No stretch
4. No tear unless nicked
5. Sinks in water
6. When squeezed into a ball, polyester does not crack
7. Excellent solvent resistance
8. Good shrink resistance
9. While burning, there is a sweet odor and droplets will form; yellow flame

*Recommended Ribbon Formulations:*

1. R-Series Premium Full Resin

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**Acetate**

*Applications:*

1. Care Labels for Clothing

*Key Characteristics:*

1. Usually no smell, but sometimes there is a slight vinegar odor
2. No stretch
3. Tears very easily
4. Sinks in water

*Recommended Ribbon Formulations:*

1. W90 Resin Enhanced Wax (for light wash care labels)
2. R96 (for dry cleanable care labels)

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