Application Profile

Work-in-Process Tracking of Hot Metals

Industries:

Metals Processing

Products:

- Polyimide hangtags: XF-610, XF-612
- Aluminum labels: XF-803, XF-807
- Polyimide labels: XF-583, XF-592

Applications:

- Tag and label identification of hot metals
  - Coils, rolls, bars, sheets, rebar, tubes, wire bundles, etc.

Compliance:

REACH and RoHS

Customer Benefits:

- High and ultra-high temperature resistances
- Non-yellowing white and yellow topcoats (hangtags)
- Polyimide and aluminum options (labels)
- Acrylic and silicone PSA options (labels)
- High tear resistance (hang tags)
- Non-yellowing topcoat chemistries

Industry Needs

The metals processing industry requires accurate barcodes be added to sheets, flat and round bars, rolls and coils at temperatures of 400+°C. The barcodes are used to identify and track materials from the furnace through delivery to their customers. Finding a durable barcode label or tag that will survive these harsh processes, stay affixed to the material and be readable throughout the 400+°C process temperatures presents a major challenge to manufacturers.

Traditional polyester and polyimide labels and tags can withstand many lower temperature applications, but do not perform well at the temperatures required for hot metal processing. When not being able to source the appropriate label or tag, many manufacturers have resorted to riveting identification plates or hand marking the barcodes on their materials. Unfortunately these options tend to slow production, are inaccurate and/or expensive due the extra equipment and labor required

Typical examples of the challenges hot metals manufacturers face are…

Company A manufactures narrow round bars which are first bundled into groups of 10-20 bars, sent through a 400°C furnace and then ride on a conveyor through the rest of the process while cooling. The bundles must be identified for inventory tracking as they exit the furnace. In this application, there was not a good ID solution on the market that would handle the heat so the manufacturer was forced to weld ID plates on his materials which added cost to his products.

Company B manufactures sheets in a similar process as Company A, only the furnace temperature is 300°C with the sheets also requiring identification as they exit the furnace. Again, there was not a good solution on the market for this manufacturer so they opted to hand mark the tracking information on the sheets with a crayon which proved to not be accurate nor durable enough for their needs.

Polyonics Solutions

Polyonics manufacturers a variety of thermal transfer printable barcode label materials and tags designed specifically for hot metals manufacturing. The materials include durable print surfaces, thick polyimide films or aluminum foils and aggressive high temperature pressure sensitive adhesives (PSA) on the label materials. They have proven their effectiveness in simplifying and improving tracking processes in many hot metals factories throughout the world.

Company A, chose a Polyonics 5 mil polyimide hangtag that is available with white or yellow print surfaces. The hangtags have already proven to help speed their track and trace identification process and reduce possible damage to the surfaces of their metals while helping them reduce their rework costs.

The Polyonics 5 mil polyimide hangtags perform effectively during long term exposure to temperatures up to 400°C and short term exposures of up to 600°C. The Polyonics hangtags also offer high tear resistances so will resist unintended removal during storage and delivery.

Company B, chose one of the Polyonics coated aluminum barcode label material that includes an ultra-high temperature silicone PSA. The specially formulated silicone PSA can withstand short exposures to temperatures up to 600°C

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and operate continuously between 300° and 400°C. Using the Polyonics aluminum labels Company B was able to quickly and accurately identify their products immediately after removal from their furnaces and have the labels remain on their metal sheets through delivery to their customers.

The Polyonics hot metal label materials can also be ordered with acrylic PSAs that perform well in applications up to 350°C and operating temperatures between 250° and 300°C.

The Polyonics family of hot metals labels and hangtags provides a wide variety of robust ID and tracking solutions for hot metals manufacturers. The polymer coatings provide durable and abrasion resistant print surfaces for critical tracking information. The coatings will also not degrade during long-term exposures to elevated temperatures plus the white coatings are non-yellowing, further enhancing their readability throughout the complete process assuring manufacturers accurate inventories.

Product	Film/face	Adhesive	Applications	Descriptions
XF-610	5 mil polyimide gloss white on one side, matte white on the other	N/A	Track & trace Identification of hot metals, coils, bars, ingots, rolls, sheets, etc. 300°C – 400°C continuous	High temperature, thermal transfer printable 5mil double sided polyimide hangtag
XF-612	5 mil polyimide yellow both sides	N/A	Track & trace Identification of hot metals 300°C – 400°C continuous	High temperature, yellow, thermal transfer printable hangtag
XF-803	Gloss White, 2 mil aluminum	1 mil ultra-high temperature silicone	Track & trace Identification of hot metal rolls, sheets, tubes, etc. 300°C – 350°C continuous	Ultra high temperature, durable gloss white label material
XF-807	Gloss White, 2 mil aluminum	2 mil high temperature acrylic	Identification for hot metal rolls, sheets, etc. 200°C – 300°C continuous	High temperature, durable gloss label material
XF-583	Matte White, 1 mil polyimide	1 mil high temperature acrylic	Identification for hot rolls of aluminum 200°C – 325°C continuous	High temperature matte label material
XF-592	Gloss White, 2 mil polyimide	2 mil high temperature acrylic	Identification for hot metal slabs, rolls, etc. 200°C – 300°C continuous	High temperature gloss white label material with ultra-aggressive acrylic based PSA

POLYONICS AT A GLANCE

Polyonics manufactures high performance polymeric materials for harsh environments. These include printable and laser markable label materials, single and double coated engineered tapes and flexible substrates with highly reflective and printable top coats. Polyonics materials are used by OEMS and converters worldwide. The ultra-thin polyimide, polyester and aluminum materials are designed expressly for high temperatures and harsh environments plus provide flame retardant and static dissipative performances for electronics, automobile, aerospace and medical components.

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