

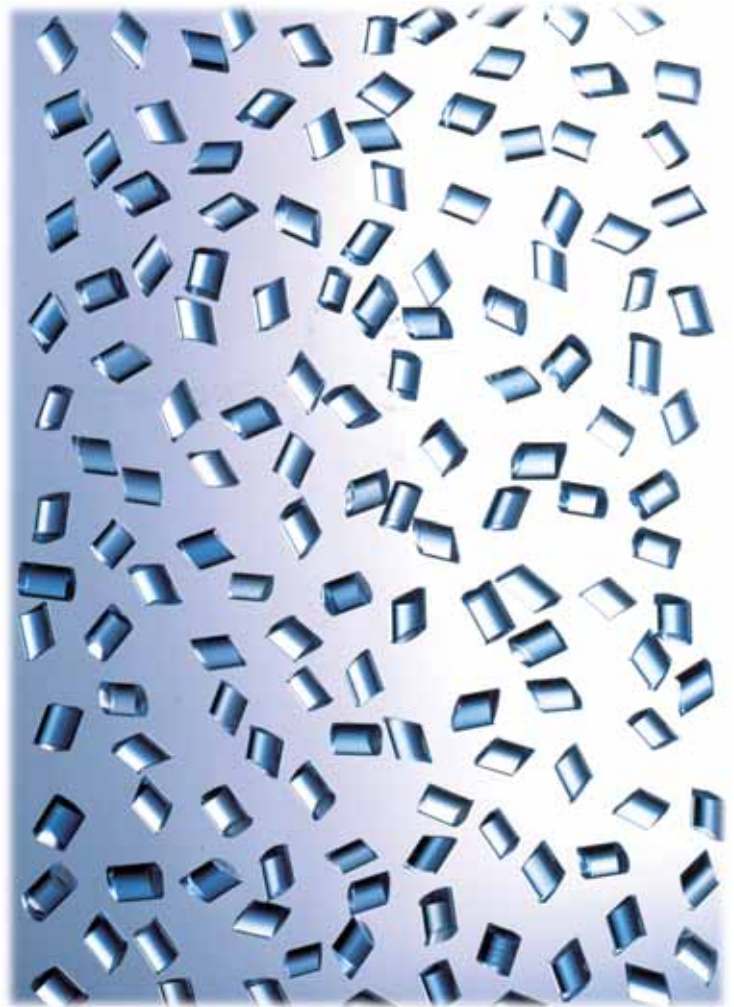
# Materials: For Discs and Beyond

*Materials suppliers for recording media quietly serve a broad range of industries*

Consumers surely don't give much thought to where all those nicely packaged DVDs come from before they appear on retail shelves. If the public thinks manufacturing at all, they think the studios make the DVDs. Those with more sophisticated knowledge of the supply chain know the role that large contract replicators perform, transforming polycarbonate and other polymers and metals from formlessness to magic as a CD or DVD. However, fewer are aware of the role played by the vendors of raw materials to the replicators.

Raw materials vendors are a source of innovation for today's manufacturing options. Key components – including polycarbonate supply, stampers, manufacturing lines, DVD cases, graphics and printing, IT intensive customer management, and logistics – are important parts of the foundation for today's successful optical media replicators. Yet these areas receive little attention.

Instead, the excitement in the industry is focused on catchier topics, including the high definition format wars; whether current



*Plexiglas Acrylic Resin, courtesy of Altuglas International*

DVD demand has leveled after eight straight years of double digit growth ending in 2005; and how to balance capacity and assets through the transformation from standard definition to high definition optical media storage – while at the same time competing in an increasingly interconnected world.

Meanwhile, suppliers including Arkema, Milliken, and DuPont not only provide important raw materials for the DVD industry, they have developed extended lines of products to serve a broad range of industries.

## **Arkema: Acrylic resin for optical media**

"I'm surprised you're writing about raw materials at all – we're almost never focused on or talked about," said Ravi Yerneni, marketing manager for Plexiglas resin at Altuglas International, Arkema, Inc.

Based in Philadelphia, Pennsylvania, Arkema was launched in October 2004 as a result of the reorganization of Total's chemicals business. Altuglas International, a business of Arkema, is the world's largest producer of PMMA [poly(methyl methacrylate)]. Its acrylic products are sold under the Plexiglas brand name in North and Latin America and the Altuglas brand name in the rest of the world.



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Arkema's acrylic resin products include rugged Plexiglas in transparent, translucent, and opaque colors; impact and gamma radiation resistant resins; frosted resin; and even granite resin with a natural-stone-like finish.

Plus, for disc manufacturing, Arkema supplies DVD manufacturers with the acrylic molding resin, Plexiglas VOD-100. "It provides outstanding optical clarity and minimum birefringence for superior optical transmission," says Yerneni. "Its easy flow permits precise replication for improved signal quality and excellent cycle time, two keys for cost-effective disc production."

The Plexiglas VOD-100 resin is specified for both single and multi-layer DVD formats. Its quality and consistency make it the preferred material for the Surface Transfer Process (STP) used in the production of DVD-14 and 18. STP is the vital step in dual layer DVD manufacturing that creates the transfer layer between the first and second metallized layers as they are built up on the polycarbonate substrate base. After performing its function, the acrylic is removed and discarded automatically in the DVD manufacturing line.

"Dual layer DVDs are a small but growing share of the DVD pre-recorded market," says Yerneni. "Plexiglas VOD-100 acrylic resin is also ideally suited for recordable/rewritable and blue-laser technologies, businesses that have significant growth potential."



*Plexiglas VOD-100 Acrylic Resin material running on DVD line*

## **Milliken: Clear polypropylene packaging**

Packaging and logistics within supply chain management are prime areas in which to explore innovative possibilities to freshen the existing DVD marketplace, while high definition gears up to provide its eventual replacement.

The graphics and printing industry supplies elements including overlay sheets, booklets, and other promotional and display material. From a technology perspective, most of these uses are "garden variety" for the printing industry. Look for this to change, though, with the emphasis on remarketing and positioning physical pre-recorded media as a long-term premiere distribution channel for movies, television, and video games.

As details about the packaging plans for Blu-ray Disc and HD-DVD have emerged, it is clear that a key goal will be differentiating high definition DVDs from current standard definition packages. Shoppers should be able to tell the difference at a glance, without confusing either the high-def or standard-def customer. The packaging also should appeal to the consumer's aspirational belief that high-def DVD is a high-end lifestyle requisite. As a result, HD disc cases will be the same panel width as existing DVD cases, but will be about two inches shorter in height, and have a narrower spine. As a result, they will have a visibly different form factor, while preserving compatibility with existing store fixtures. Also, HD cases are colored or clear transparent, as opposed to black.

These features are important to Milliken Chemical and their clearing additive, Millad 3988. Milliken is a privately held textile company with a chemical division that supplies core technologies for textiles, plastics, colorants, and antimicrobials.

For disc cases, Milliken offers Millad 3988, a clarifying material for polypropylene, and ColorTint coloring material, to provide bright and vibrant color after the polypropylene has been clarified.

Millad 3988, a third generation offering, is a clarifying agent that when added to the resin maximizes the clarity of polypropylene and positions it to compete with black DVD cases and polystyrene for packaging solutions.

Comments Jim Spry, director of global business development at Milliken: "Because the packaging is clear, one of the benefits it gives you is the opportunity to double the artwork from two to four panels." That's more real estate available for graphics and brand- or title-specific promotion. And with the inside surfaces of the DVD case available for graphics, see-through polypropylene allows a richer visual environment surrounding the disc when the consumer opens the case. Another advantage, says Spry, is that "clear packaging avoids the need for the paper inserts that people stuff in the box, either as a graphic, chapter selection, or advertising for future releases. These can be lost or misplaced, while the cover insert remains."

One creative use of clear disc packaging was for the movie *Saw*, from Lions Gate Home Entertainment, which won the 2005 Alex Award presented at EMX last August

for its innovative packaging. The DVD comes in a clear, nearly transparent case that enhances the lightness and freshness of the graphics and printed information, and allows the consumer to see the DVD inside. The DVD has a large saw blade graphic printed on its surface, and spins freely on its hub, creating a reminder of the menace that the movie is famous for.

Spry sees prerecorded optical media packaging, whether it is for movies, TV shows, music, video games, or computer software as a prime market for many of his company's products. Sony's UMD prerecorded discs for the PlayStation Portable also feature clear polypropylene cases.

For HD DVD and Blu-ray discs, the use of clarifying polypropylene in combination with a transparent coloring agent not only can help with product differentiation for the high definition offering, but also can deliver a "cool look" emotionally that conveys high quality and a premium experience for the consumer.

## **DuPont: Tyvek sheet products**

Beyond hard disc cases for retail products and long-term storage, there's also a need for soft slipcases for more accessible disc storage. This has become a good application for DuPont Tyvek brand protective material. DuPont is the second largest chemical company in the United States, and number 73 in the Fortune 500. Tyvek grew out of research into nonwoven fabrics that was started in 1944, introduced in 1961, and then began to live up to its promise by the end of the 1970s.

Tyvek is a family of tough durable sheet products of high-density polyethylene fibers. The sheet is formed first by spinning continuous strands of very fine interconnected fibers, and then bonding them together with heat and pressure. Tyvek is white, non-toxic, chemically inert, and contains no binders. The non-woven sheet, after bonding, combines a good printing or coating surface, high opacity, and toughness.

Just in the graphics area, Tyvek is used for applications including strong and moisture-resistant tags and labels; bright and weather-proof banners and signs; durable maps and guides for outdoor use; as well as bags, book covers, and children's books that are moisture and rip-resistant. Tyvek can also accept four-color graphics.

And for disc storage, slipcases of Tyvek are popular as sleeves for blank discs, and as a protective component in accordion and book style cases that store dozens of discs in one convenient album.



*Tyvek disc slippcases,  
courtesy of DuPont*

Debra Ackerman, packaging marketing manager at DuPont for nonwovens Tyvek, describes its advantages: "DVD slippcases made of Tyvek are lighter than paper, stronger, acid free, and an ideal choice for both long and short term storage of DVDs and CDs. They are even more scratch-resistant than paper, but cannot eliminate scratches entirely." DuPont claims that its non-abrasive smoothness and anti-static properties actually prevent disc errors, while generating none of the debris that can get on a disc and interfere with its readability or even damage its surface.

DVD rental company Netflix uses slippcases of Tyvek to protect discs it ships to its customers. Steve Swasey, director of corporate communications, describes it as a good, strong shipping enclosure that is cost effective. The Netflix disc package does not contain title-specific graphics. Instead, each Tyvek sleeve has a paper sticker attached that contains information about the title.

Ackerman also describes other packaging configurations, including "laminating to various card stocks, when more durable packaging is required while still utilizing the properties of Tyvek for protection of the DVD/CDs."

This suggests some interesting applications for today's DVDs: The deluxe edition of a DVD could include a Tyvek slippcase to provide a storage solution for when the disc is between the case and the DVD player. Similarly, children's titles could include a Tyvek slippcase as an assist for parents who are often on the losing end of efforts to keep their young child's hands off a shiny smooth DVD surface. These kinds of uses would seem to be very attractive, unless my friends and family are the only consumers who let their DVDs pile up around the player and the TV set, instead of immediately returning them to the DVD case. Including compelling graphics for the repeat viewer would be icing on the cake. – ☺

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