

Clarifoil



Clarifoil
Cellulose acetate film

Label Applications
Tamper Evidence
Anti-Counterfeiting

www.clarifoil.com

Clarifoil

- Clarifoil is bio-degradable and compostable
- Clarifoil is a versatile film for tamper-evident and anti-counterfeiting label
- Clarifoil is easy to process and can be over-printed
- Clarifoil is available in a range of finishes

**Environmental responsibility
without compromise**

Clarifoil

Label Applications



Transparency, printability and easy tear properties make acetate good for labels, especially in tamper evident applications

Clarifoil

Processing

- Clarifoil's stiffness facilitates automatic labelling, matrix stripping and die cutting
- Clarifoil conforms well around awkward shapes

Clarifoil

Clarifoil "entry level" security

- Standard Clarifoil film is identified from "commodity" plastic films by a simple chemical test using acetone
- Clarifoil is manufactured only in the U.K. and distributed to reputable producers
- Is thus under greater control than with "commodity" plastics.

Clarifoil

Higher level technologies for Security

- Integuard
- Semitone™
- Signature
- Incorporation of other chemical security agents

“Integuard”
Ultra destructible label film

Clarifoil®

- Fully transparent or opaque white versions
- Coupled with appropriate adhesive, Integuard labels fragment into shards if removal is attempted
- Integuard is not a “filled” product but is chemically engineered to enable automatic processing and application whilst retaining its tamper evidence in use

Semitone™

Clarifoil®

- Micro-etched surface pattern
- Sophisticated “satin like” look and touch
- Generates distinctive noise when rubbed
- Authentication check using an appropriate line grating to reveal “hidden” pattern

Signature

Clarifoil®

- A “water mark” image (matt image on clear film or a clear image on matt film)
- Image can be a repeat pattern company logo or design, enhancing both company image and authentication
- Option of additional features
 - Film can contain optical brightener (OB)
 - An invisible “micro logo” can be contained within the larger image

“Blackout” Film

Clarifoil®

- Opaque black film, one side high gloss, the other matt
- Infra Red transparent.
- IR bar code scanner to “reads” through the film
- A bar code printed onto carton board can be hidden by application of a Blackout label, yet still be “read” by scanner

Clarifoil Label Stock

Clarifoil®

- Product authentication features can be incorporated
- Available in clear, full matt, Satiné and Semitone
- Printable by most processes without corona treatment
- Accepts both solvent and water based adhesives without treatment

Low temperature manufacturing process facilitates inclusion of various chemicals

Clarifoil®

- Infra red agents, energised using a hand held device
- Thermo-chromic and photo-chromic dyes
- Fluorescent coloured and optical brightened films, with a distinctive edge glow if torn

Environmental Issues

- Home-compostable and bio-degradable
- Raw material is wood pulp from managed forests
- Wood is GM-free
- Clarifoil is compostable with paper and board
- Incinerated, generates energy without noxious or hazardous bi-products



Introduction to Clarifoil

- The world's leading producer of cast cellulose diacetate films
- Clarifoil is both the company name and brand name
- Manufacturing cellulose acetate films since 1949
- Part of Celanese Inc, a global company with 8,400 employees and a \$6.4 Billion turnover
- Clarifoil headquarters and production facilities are located near Derby in the U.K. Offices and warehousing also in France and USA

Cellulose Acetate Process Overview

- Wood pulp (cellulose) + acetic acid \Rightarrow cellulose triacetate
- Hydrolysis of cellulose triacetate \Rightarrow Cellulose diacetate "flake"
- Flake + acetone \Rightarrow Polymer solution ("dope")
- Cast dope \Rightarrow Film

Conclusions

- Clarifoil labels provide enhanced security and anti-counterfeit facets
- Clarifoil can build "feature on feature" to provide security combinations especially difficult to replicate
- We work with our customers to provide custom solutions to labelling problems

Environmental responsibility
without compromise

Thank you!

Other Clarifoil Applications

Print Lamination

Clarifoil®

- High clarity
- Gloss, matt, semitone or Satiné
- Scratch and scuff resistant
- Wet or thermal lamination



Pressure sensitive tapes

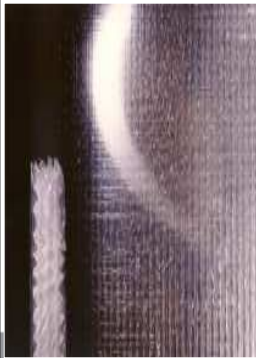
Clarifoil®

Acetate is readily coated, easy to tear, has write-on surface and shows no photo-copy edge shadow



Insulation

Clarifoil®



Utilises acetate's transparency, light weight, UV stable, flame retardant and easy cutting properties for railway carriage/ tram walls and factory/ office roof lights

Enhanced shelf life

Clarifoil®



UV films provide protection to sensitive foods such as chocolate, seafood and textiles against the degradation effects of sunlight

Polarising Sunglasses

Clarifoil®

- Clear or coloured films at 350µ or 525µ
- Protects the polarising layer
- Film includes a UV absorber to reduce UV 400 transmission to <1%
- Extremely clear film with low haze

