

WACKER

CREATING TOMORROW'S SOLUTIONS

GENIOPLAST®

PLASTICS | PERFORMANCE ADDITIVES

KEEP COOL WITH INTEGRATED FIRE PROTECTION

Case Study: Aluminum Composite Panels

GENIOPLAST® PELLET S IMPROVES FLAME RETARDANCY IN ALUMINUM COMPOSITE PANELS (ACPs)

Aluminum composite panels (ACPs) used on building exteriors have a plastic core that contains fire-retardant (FR) fillers. To make these compounds easier to process, a silicone additive, GENIOPLAST® Pellet S, is added.

Aluminum composite panels consist of 2 aluminum sheets bonded with an adhesive to a non-aluminum core. To ensure that the aluminum panels do not act as a cold bridge and encourage heat loss, an insulating plastic layer is sandwiched between two aluminum layers. The non-aluminum core consists of a highly mineral filled polyolefin compound which is highly flame retardant. ACPs are increasingly used to construct buildings. In the event of a fire, the aluminum panels increase heat rejection so that fire propagation is stopped.

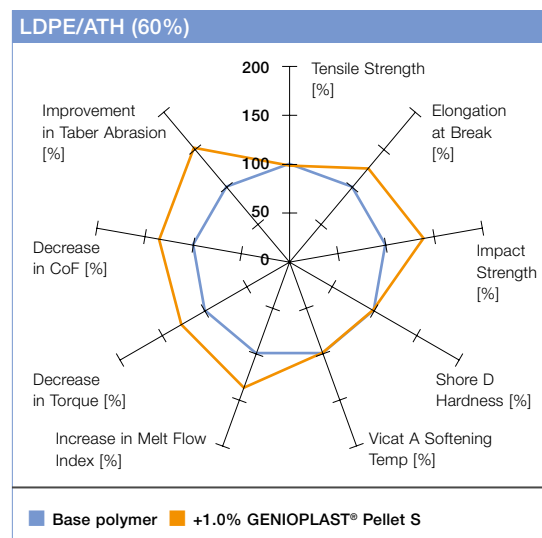
Requirements

- Flame retardancy is a critical factor in many applications, e.g. construction
- Non-toxic materials (HFFR, LS0H)
- 80 – 85% mineral filler (ATH/MDH) is required to pass the highest flame classification A1

GENIOPLAST® Pellet S Improves the Manufacturing and Processing of ACPs as well as their Mechanical Properties

ACPs are manufactured in several steps (separate or combined). The compounding step of the non-metallic core material, which is based on an HFFR compound, may involve some difficulties in flow behavior, which can cause die drool on the extruder die. GENIOPLAST® Pellet S simplifies processing (lower torque), improves the flow properties (higher MFI value) of the highly mineral-filled PE compound even at dosages of less than 1%. In addition, the mechanical properties of the PE compound are improved. As a result,

there is less die build-up and there are fewer cleaning steps. There is no influence on adhesion to the other layers obtained. GENIOPLAST® Pellet S has to be compounded together with the PE and mineral filler.



GENIOPLAST® Pellet S has a positive impact on several material characteristics.

Adding GENIOPLAST® Pellet S Improves Fire Performance in ACPs

Cone calorimetry – an important test method for fire performance – shows that when a compound containing GENIOPLAST® Pellet S combusts, the peak heat, total heat and smoke release rate decrease. A dosage level of 2% is recommended. In order to obtain the optimum compounding level, GENIOPLAST® Pellet S is dry-blended with the polymer base resin and fed in a gravimetric feeder. The FR filler is dosed separately in a gravimetric dosing system in the feeder.



Material
ATH/MDH HFFR
compounds



Additive
GENIOPLAST® Pellet S



Dosage
1 – 3%

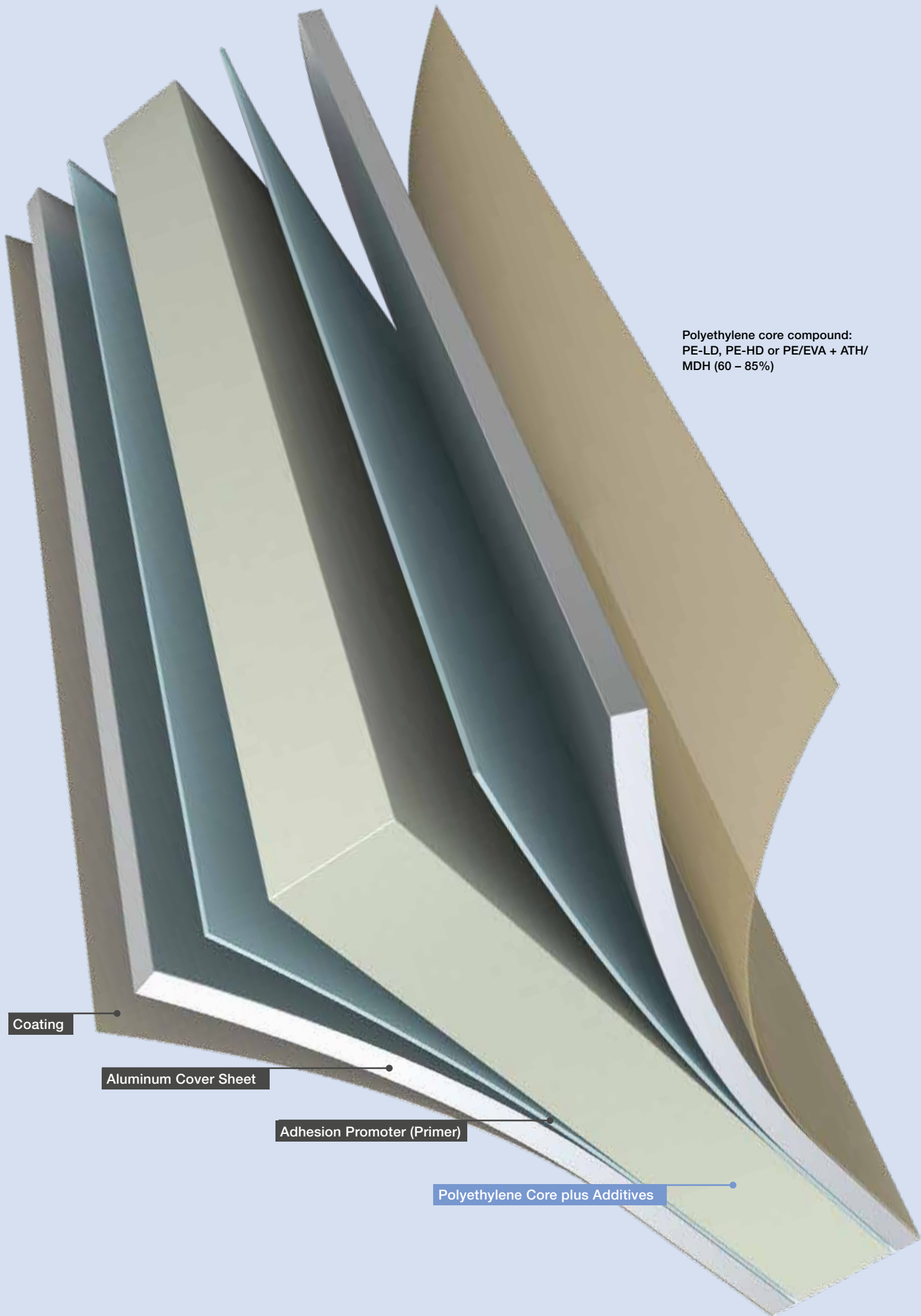


Application
PE core layer of ACPs



Key Benefits

- Improved fire retardancy (lower smoke release rate)
- Simplified processing (lower torque)
- Better flow behavior
- Improved mechanical properties
- Reduced die build-up
- Fewer cleaning steps



Polyethylene core compound:
PE-LD, PE-HD or PE/EVA + ATH/
MDH (60 – 85%)

Coating

Aluminum Cover Sheet

Adhesion Promoter (Primer)

Polyethylene Core plus Additives

WACKER

Wacker Chemie AG
Hanns-Seidel-Platz 4
81737 Munich, Germany
Phone +49 89 6279 -1741
info@wacker.com

www.wacker.com

www.wacker.com/socialmedia



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