

LOTADER® 4210

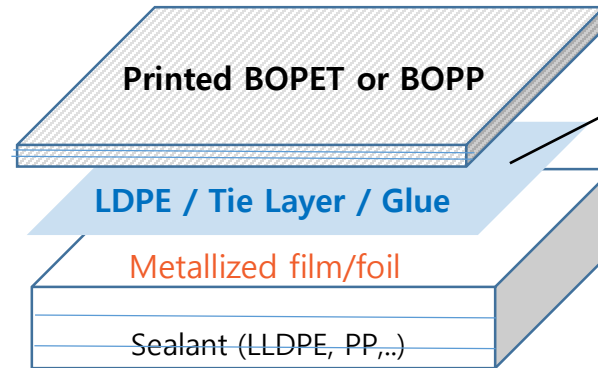
SKGC ALTERNATIVE TO ACID TERPOLYMER

SK geo centric / SK functional polymer

April 2022

LOTADER® 4210 MAIN MARKETS & SOLUTIONS

TYPICAL PACKAGING STRUCTURE : FOCUS ON BARRIER COMMODITY LAMINATE



Several Options for Lamination

- 1) *Adhesive lamination (glue lamination)*
- 2) Primer / LDPE
- 3) Primer / [LDPE + Lotader® 4210]
- 4) Lotader® 4513T

-
+
Bond / €

LOTADER® 4210 MAIN MARKETS : COMMODITY PACKAGING & CONSTRUCTION MEMBRANES

SNACK FOOD PACKAGING

OPP-ink/primer/**LOTADER® 4210** + LDPE/met-BOPP



INSTANT COFFEE SACHET

OPET-ink/primer/**LOTADER® 4210** + LDPE/Alu/**LOTADER® 4210** + LDPE/LLDPE

RADIANT BARRIER MEMBRANE

HDPE Woven/**LOTADER® 4210** + LDPE/Alu foil



LOTADER® 4210 : BEST ALTERNATIVE TO ACID TERPOLYMER

LOTADER® 4210 IS A
REACTIVE TERPOLYMER



Similar “reactive concentrate”
Same melting point, Similar MFI, ...

Ethylene – Butyl Acrylate – Maleic Anhydride (MAH*)

6.5 %

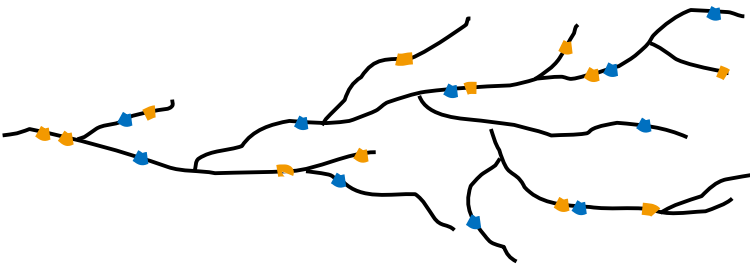
3.6 %



LDPE
family

Polarity
Crystallinity control

Reactivity



Processability

Adhesion

Reactive adhesion

Properties	Lotader® 4210	Competition grade
MFI 190°C, 2.16 kg)	10	11
Density (23°C)	0.94	0.92
Melting Point (°C)	105	105
Vicat (°C)	69	79
Freezing Point (°C)	89	85

COMPETITION GRADE
REACTIVE ACID TERPOLYMER

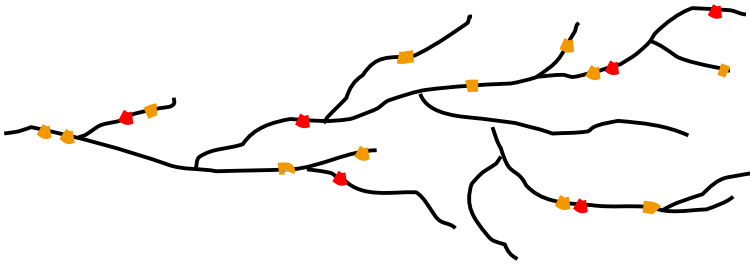
Ethylene – Acrylate – Acid monomer



LDPE
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Processability

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* MAH turns to diacid during extrusion

LOTADER® 4210 RECOMMENDATIONS & BENEFITS

→ **Lotader® 4210** blended in LDPE to enhance adhesion in multilayer laminated films structures

- **10 to 30 % in LDPE**, depending on required adhesion level
- High thermal resistance up to **330°C - 340°C**
- **High Processability** in extrusion coating
- **Excellent bonding** to metallized films and aluminum
- Primer is required on the printing or oriented film side

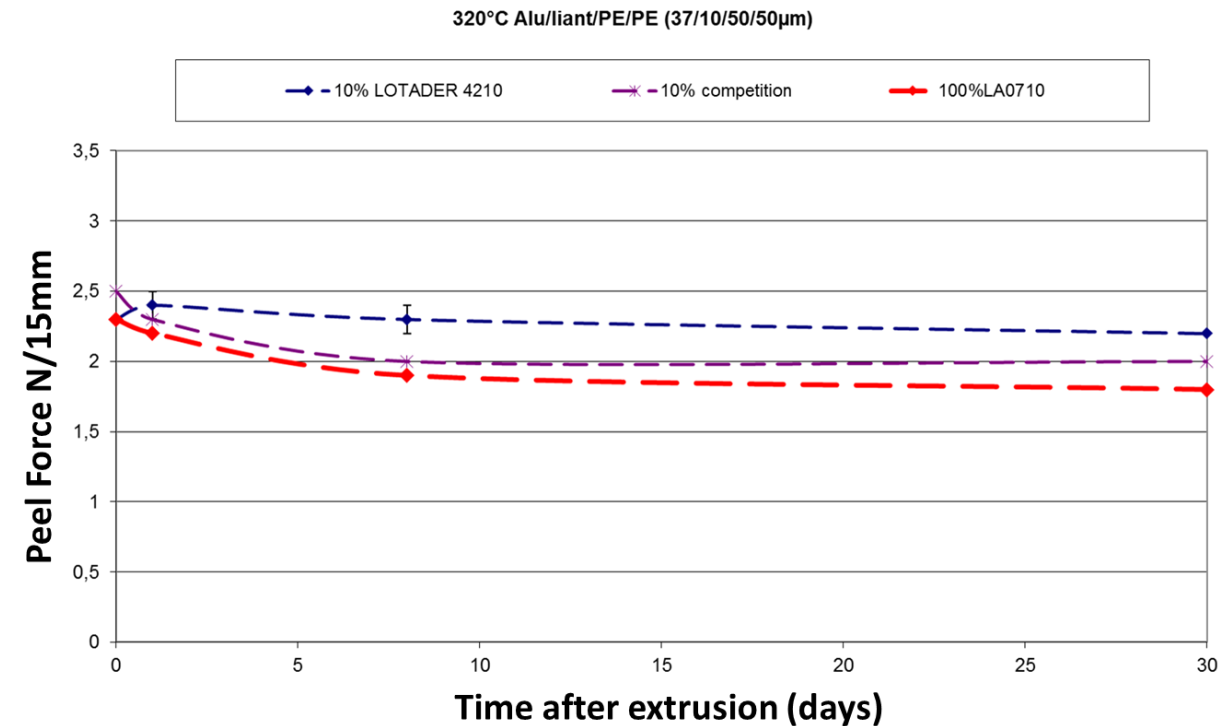
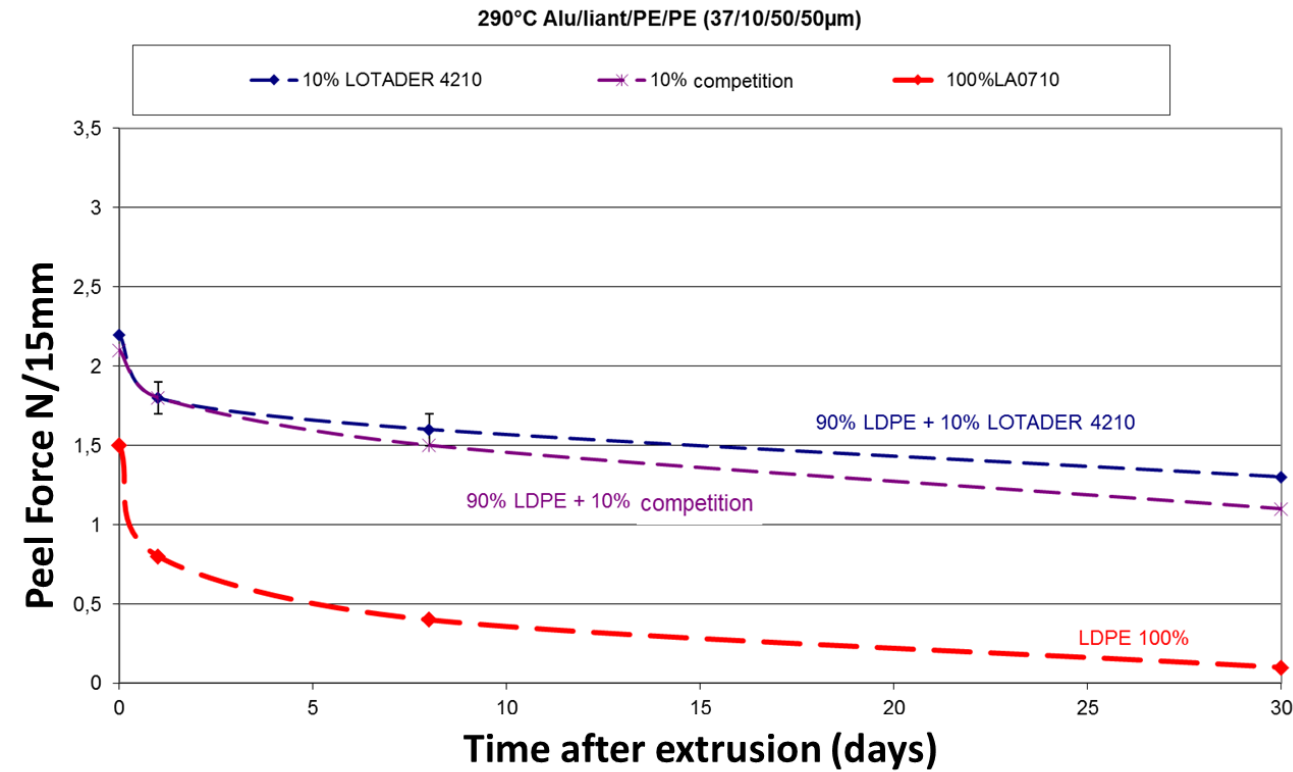


→ **Multiple advantages of using Lotader® 4210 instead of acid terpolymer**

- **Non-corrosive** for equipment (does not contain acid functions)
- **Shorter transition** in production since fully compatible with LDPE
- **No extensive purging** needed → lower downtime; better productivity
- Similar power consumption to LDPE → **no additional production costs**

LOTADER® 4210 vs COMPETITION GRADE : BONDING PROPERTIES ON ALU

- Comparison of Lotader® 4210 and Competition grade bonding on Alu at 10% loading in LDPE
- Two extrusion temperatures : 290°C / 320°C



LOTADER® GMP & PURGE FOR SUCCESSFUL TRIALS !

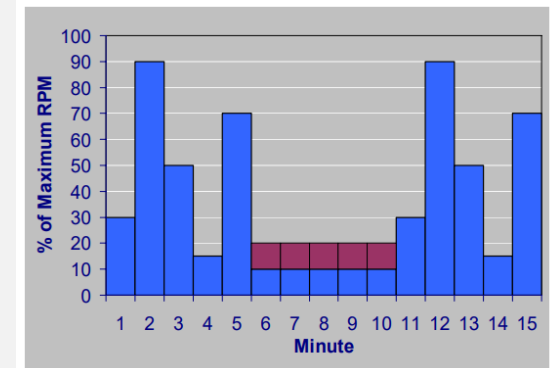
LOTADER® 4210 GMP

- Lotader® 4210 = **moisture sensitive** due to possible hydrolysis of MAH
- Lotader® 4210 resins **packed in aluminum bags**
- **Good Manufacturing Practices (GMP)** to avoid moisture uptake
 - Fresh bag is open should be extruded within the day
 - Reseal open bags after use
 - Lotader® 4210 exposed to ambient air for more than one day is wasted and should not be extruded. If extruded, there is a risk to get die build-up issue (carbon deposits) and voids.
- **Recommended extrusion temperature: 290-320° C**

LOTADER® 4210 Purging Procedure

- Purge the extruder with viscous LDPE using the **“disco purge” procedure***, enough time to get a clear web, and then switch to Lotader® 4210
- Purge will be key to **avoid gels coming from transition from acid copolymers/ionomers to Lotader® 4210**

Disco Purge Method



* reference: Dow-Dupont (TAPPI PLACE 2007, J.D. Vansant)

Thank You for your attention!
Question Time!

감사합니다
Merci