Compounding Fillers *from Minerals*

INDEVCO

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OUR COMMITMENT

is to develop and expand production from naturally abundant minerals, in order to offer sustainable raw material options to plastics converters

Management Approach

INDEVCO Flexible Packaging division in Egypt and Napco National Flexible Packaging division in Saudi Arabia have identified renewable raw materials for plastic packaging as a material topic. The plants manufacture mineral fillers to replace fossil-fuel based raw materials and, thus, reduce direct impacts, and the impacts of sister plastic packaging manufacturers and external plastic converters. By using mineral fillers, plastic converters convert fewer fossil fuel-based virgin materials, thereby reducing depletion of finite nonrenewable resources, carbon footprint, and greenhouse gas (GHG) emissions.

Context

With increasing scrutiny, finding alternatives to finite fossil fuel-based raw materials in plastic packaging has gained momentum. Minerals such as Calcium Carbonate and Talc are naturally abundant and commonly used in plastic film converting, due to improved properties and high-performance. Using mineral fillers in plastics converting has steadily increased over the years with the calcium carbonate fillers projected to grow by 5.3% CAGR by 2025 [1] and the talc filler market to grow by 4.91% CAGR through 2023 [2].

Calcium carbonate is one of the most common raw materials on earth, found in such natural sources such as limestone, chalk or marble and composing 4% of the earth's crust. This mineral is naturally replenished by rivers, lakes and oceans or formed as minerals in the form of shells, skeletons, stalactites and stalagmites. Calcium carbonate is renewed at minimum twice the rate of consumption, thus meeting the ISO 14021 definition of renewable. [3] It is the most commonly used inorganic filler in plastics with a market share of 34%. [4]

OUTCOMES

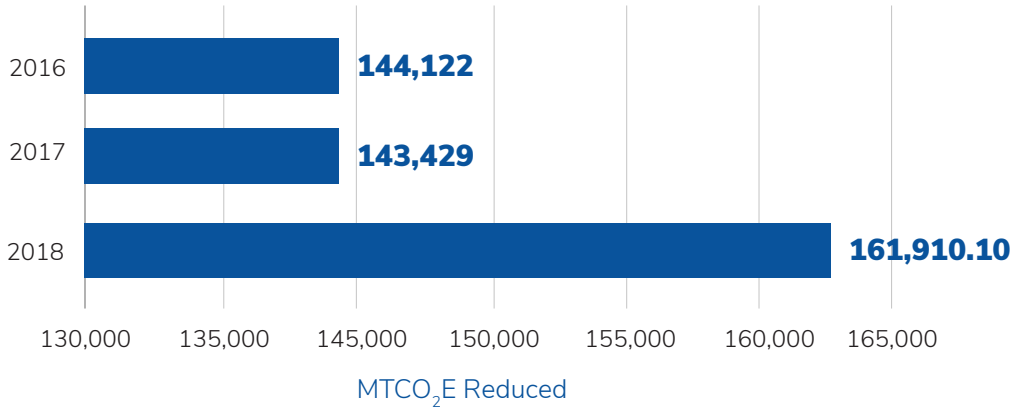
Egypt, Saudi Arabia

In 2018, INDEVCO expanded compounding of MicroMB calcium carbonate fillers by nearly 13% at Masterpak Nile in Egypt and Napco National's Recom in Saudi Arabia.

These naturally abundant and renewable raw materials play a fundamental role in regenerating plastics by enhancing the mechanical and physical properties of plastic scrap that would have otherwise been lost in the recycling process. Calcium carbonate fillers enhance plastic film converting by speeding up heating, cooling, and converting. They also assist in downgauging, increasing output, and reducing blend structure cost. When used in recycling plastics, the fillers help maintain stiffness, impact strength, and barrier property, as well as increase material viscosity. [5] End applications for calcium carbonate filler include blown and cast films, blow molding, injection molding, and rotational molding. [6]

Masterpak Nile tripled talc filler production, 100% of which was sold externally. Silica-based talc fillers assist production of softer surface plastic films with better tensile strength, heat resistance, impact absorption, stability, and electrical insulation. Talc filler is used for blown films, while specialty micronized grades are used for automotive and engineering plastics products, as well as household appliances. [7]

GHG Emission Reduction from Use of $CaCO_3$



IMPACT

Increase

CaCO3 Production by 12.9%

Eliminated GHG emissions by

161,910 $MTCO_2E$

of carbon dioxide equivalent

Increased

Talc Production 3-fold

Learn More http://sustainability.indevcogroup.com/pdf/INDEVCO-2017-Mineral-Filler-Initiative.pdf

See Appendix I for references.

APPENDIX I

Compounding Fillers from Minerals References

1. Grand View Research (2018, January). Calcium carbonate market worth $34.28 billion by 2025 | CAGR: 5.7%. www.grandviewresearch.com/press-release/global-calcium-carbonate-market
2. Modor Intelligence (2018, May). Global talc market – Segmented by deposit, end-user industry, and geography - Growth, trends, and forecast (2018 -2023). www.mordorintelligence.com/industry-reports/talc-market?gclid=CjwKCAjww6XXBRByEiwAM-ZUIPVfDL1IgkbFo_F4o9rNceyAFF6dW2N9zFOUJcYEBJ4uFn4guBkxVRoCbA0QAvD_BwE
3. CCA Europe (2016, March). Calcium carbonate is a renewable raw material. www.ima-europe.eu/sites/ima-europe.eu/files/publications/Renewability%20 short%20statement_FINAL.PDF

4 & 5. Elsevier Science of Total Environment (2018, January). Are functional fillers improving environmental behavior of plastics?

6 & 7. Roskill (2015). Talc: Global industry markets & outlook, 10th Edition. https://roskill.com/product/talc-global-industry-markets-outlook-10th-edition-2015/

8. Pusch, Thema Umwelt, 1/2009, p. 3. https://timeforchange.org/plastic-bags-and-plastic-bottles-CO2-emissions Derivation: 0.2 MT of CaCO3 reduces 1.1 MTCO2 E; 1 MT CaCO3 reduces 5.5 MTCO2 E