

# Importance of Paper in Our Daily Lives- Role of Minerals in Making Paper More Sustainable



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**Abstract:** *Paper is biodegradable, sustainable and a very important part of our day-to-day life. In addition to the traditional applications like printing and writing, paper has been finding exciting applications especially in the packaging industry as a substitute for plastics. This paper focuses on role of minerals suppliers in making paper more sustainable. The right choice of filler is critical for maximum value creation and principally depends upon the end use applications. The minerals suppliers have been involved in extensive R&D to develop innovative solutions to load more filler in a sheet of paper in a sustainable way.*

In the current digital age, paper has its own importance and is part and parcel of our lives. Paper is a sustainable alternative to single use plastics and a positive contributor to the environment. The matter of fact is >85% of paper in India is produced using recycled paper and agro based residues as raw materials. The paper mills using virgin fiber are involved in social forestry planting approximately four trees for every one cut. Global trends follow a similar pattern. The paper industry has been demonstrating an increasing level of responsibility and maturity by following the mantra of “responsible growth”. There have been ever-increasing initiatives around judicious use of resources such as fiber, water, power, etc. thereby making paper a smart and affordable choice to consumers.

In terms of volume, minerals are the second largest additive in paper after fiber. Filler levels in W&P applications in the Indian Paper Industry are gradually trending upwards from a traditional level of 10% to current levels of 20%. In the coming years, it is predicted that the filler levels will further trend upwards towards 30% and above. Minerals bring a lot of value in a papermaking environment by improving critical properties such as brightness, opacity, smoothness,

## Introduction

The last couple of years have been tough to mankind with the pandemic teaching us to adapt during challenging circumstances. With increased vaccination rates, the situation is improving, and the world has gradually started to open up. However, there has been a drastic change in our mindset both in personal as well as professional lives. In our personal lives, we are more committed to health and safety while in our professional lives, there has been increased focus on critical attributes such as sustainability in terms of environment, products, and services.

\*Minerals Technologies India Pvt. Ltd.

Paper Day write-up

printability, gloss, etc. which makes paper more productive and cost effective. Minerals suppliers have evolved into reliable partners to the paper industry by providing value based and tailored products and services. The right choice of filler is extremely important for maximum value creation, and it depends upon the end use applications.

Choice of Filler

There are several options available to a papermaker in terms of filler solutions viz. GCC, Talc, PCC, etc. The right balance between quality improvement, productivity, cost effectiveness, market realisation and end use performance are the key drivers to choose the right filler. Besides, it is equally important to choose a filler that is environmentally friendly and that synchronizes with the mill's sustainability initiatives. It is important to choose a right 'partner' who will consistently work with the papermaker to meet the above-mentioned objectives. Below are some of the key mineral attributes that are considered critical in choosing the right filler:

- o Particle structure (morphology)
- o Particle size
- o Surface area
- o Distribution
- o Surface chemistry

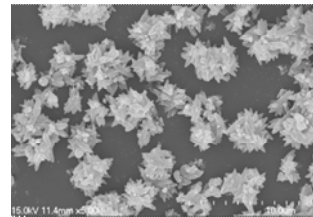
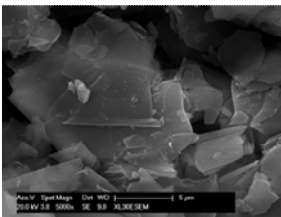
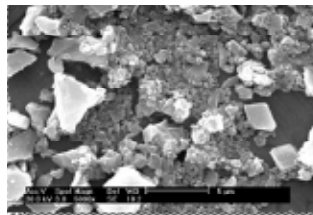


Figure 1:

Options for fillers in W&P Applications. L-R: GCC, Talc, PCC

It is important that a filler is cost effective to create maximum value to a papermaker. Some of the concepts like Onsite PCC Satellite Plants help the paper industry to not only get a consistent quality filler in a cost-efficient way, but also help reduce the carbon footprint at the mill (less CO<sub>2</sub> emissions, less traffic, etc.)



Figure 2: Onsite PCC Satellite Plant

Innovative Technologies

Minerals are used in various stages of papermaking process- wet end filler, coating grade pigments, barrier coating additives, pitch control, etc. to name a few. "Ash is Cash" is a common saying and papermakers strive to maximize filler levels in a sheet of paper for the same reason. The right choice of filler will help a papermaker in attaining high filler loading while maintaining/improving critical paper properties and productivity at the paper machine. Calcium Carbonates have been the preferred choice as a wet end filler especially after the advent of alkaline sizing and the increased value of maintaining bulk in paper.

Minerals suppliers have been tirelessly working towards developing high filler technologies that enable papermakers to increase the filler levels in a sheet at an acceptable quality, productivity, and end use performance. This serves the purpose of judicious use of natural resources, especially pulp fibers. There are a variety of approaches developed in this regard and some of the examples include treatment of filler with natural polymers, chemical additives, filler fiber treatment, surface modification of fillers, etc.



Figure 3: Example of High Filler Technology Portfolio

Some minerals suppliers have also been able to develop solutions around converting paper mill waste streams into a usable filler thereby contributing towards the circular economy concept. The waste streams could be from integrated pulp and paper mills and/or from the wastepaper-based paper mills. The products can partially or fully replace the existing filler depending upon the end use requirements of paper/board being produced.



Figure 4: Example of Sustainability Driven Initiatives

Another important application of minerals in paper industry is in the form of a **coating grade pigment** which provides various advantages such as gloss, printability, brightness, coverage, etc. WGCC and Clay have been the preferred choice of pigments in the past. However, there have been developments around producing high quality and tailored coating grade PCC that not only makes the end user excited with improved quality, but also helps in partially replacing the petroleum based latex binders with natural polymers- sustainability initiative. However, any coating grade PCC project is volume sensitive and needs pigment demand of >50,000 TPA to make it commercially more attractive.

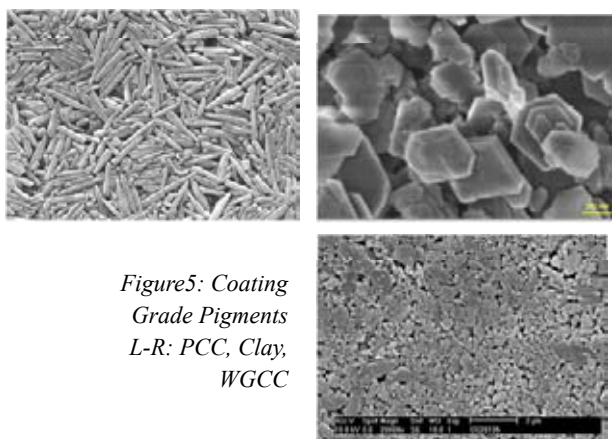


Figure 5: Coating Grade Pigments  
L-R: PCC, Clay, WGCC

**Sustainable packaging** is one of the important topics being discussed and developed in recent times. Minerals based barrier coating solutions help papermakers in achieving several important properties such as OTR, OGR, WVR, etc. The paper industry can expect a growing number of commercially available products from the minerals suppliers in the near future that will help them meet the critical properties mentioned above in a sustainable way.

### Role Of Specialty Minerals Inc (SMI)

SMI is a business segment of Minerals Technologies Inc (MTI) providing products and solutions to various industries, the paper industry being one of them. SMI's core growth strategies are focused on geographic expansion and new product development. SMI utilizes industry-leading technology and experience to produce high quality and cost-effective Precipitated Calcium Carbonate (PCC) products and solutions has been a leader in PCC development since 1938. As the global leader in the supply of PCC for paper filling and coating, SMI has 54 PCC plants around the world. Specialty Minerals is positioned to continue to grow PCC volume globally with new satellites, technology deployment and capacity expansions.

Recent expansion in Asia is adding over 4,40,000 metric tons of new capacity of which **India comprises of 1,15,000 MT**, China 2,00,000 MT and Indonesia of 125,000 MT. Following are some of the ongoing initiatives at SMI to help paper become more sustainable:

- Strong focus on safety, operational excellence, diversity & inclusion that helps in achieving and sustaining high performance standards
- Variety of grades of PCC developed based on the "Voice of Customer" e.g., Albacar®, Megafil®, Opacarb®, etc.
- Fulfill® portfolio of High Filler Technologies which helps in increasing paper ash at acceptable runnability, quality and end use performance
- New Yield® and Envirofil® technologies that convert paper mill solid waste to usable filler
- Strong pipeline of New Product Development initiatives focused on quality improvement, cost savings and sustainability.

### Conclusion

Minerals are an integral part of the papermaking process, and the right choice of filler/pigment goes a long way in determining the realisation and penetration of paper in the market. It will determine the catalyst to translate a happy customer to a delighted customer. Leading minerals suppliers have invested in people with a vision to serve the customers and have a robust succession planning in place. Leading minerals suppliers have a robust pipeline of New Product Development and many of them are focused on sustainability. The minerals suppliers will continue to support the industry in producing paper in a more sustainable way, and choosing the right partner will be a critical step in this process.

The paper industry has evolved into a clean, green, and responsible industry providing employment (direct or indirect) to thousands of families. The paper industry is in the process of becoming increasingly technology driven with a focus on helping to conserve resources and produce paper more efficiently. We should all be encouraged that we are a part of a growing market and paper demand is expected to increase even beyond the pre-pandemic levels because of the new mindset of the consumer globally. This mindset includes the use of sustainable, cost efficient and biodegradable products that will not damage the environment. The minerals suppliers like SMI will continue to partner with the paper industry in achieving these ambitious goals.

### References

SMI Internal knowhow and marketing material