

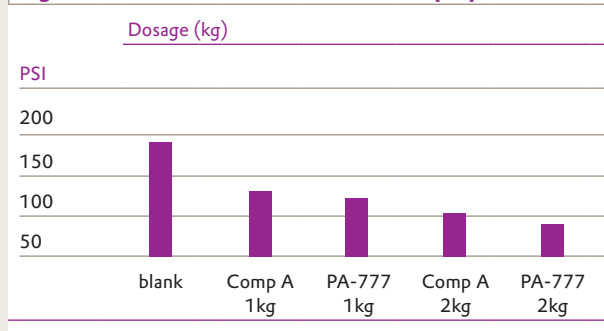
Test Results

Mullen Burst Reduction on Commercial Fluff Pulp

Fluff Pulp Debonders

As shown by the decrease in Mullen Burst strength, the market pulp was partially debonded at 1 kg per metric ton, but was fully debonded at 2 kg/ton dosages by AROSURF® PA-777. Although the performance of Competitor A tapered off at the higher dosage, AROSURF® PA-777 continued to exhibit sustained performance.

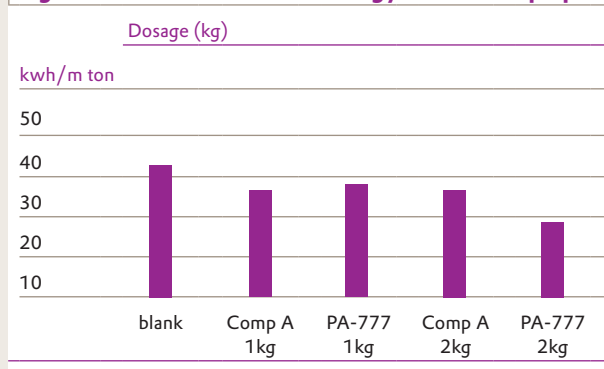
Figure 1 Mullen Burst for treated fluff pulp



Kamas Hammermill Defibration Energy

Both AROSURF® PA-777 and Competitor A effected a reduction in energy consumption for the defibration of the fluff pulp, but only AROSURF® PA-777 exhibited a progressive reduction with increasing dosage.

Figure 2 Kamas Defibration Energy for treated pulp

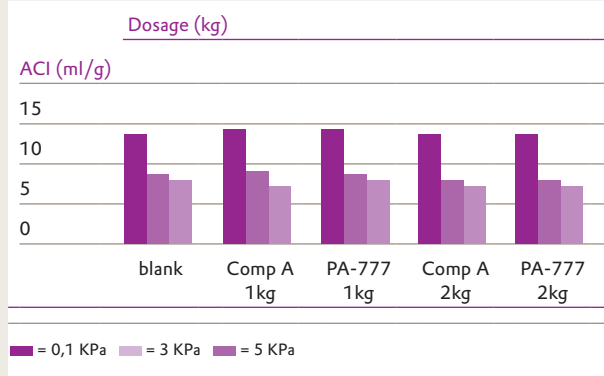


Absorption Studies

Absorption properties of treated pulp are measured by several techniques and vary from producer to producer, so only a few representative examples will be presented here.

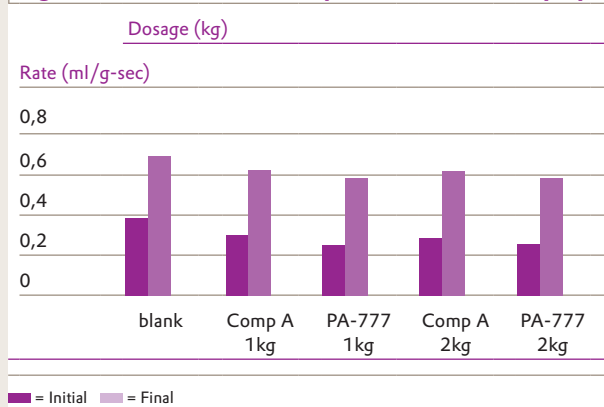
To mimic conditions where an absorbent pad is subjected to a force such as the weight of an infant or meat, comparative testing of fluff treated with AROSURF® PA-777 and Competitor A under 3 loading conditions was conducted. As Figure 3 demonstrates, even the untreated pulp exhibited a reduced capacity or „squeeze out“ under increased load. More importantly, the absorbency capacities of the debonded pulps matched those of the untreated material.

Figure 3 Absorbency Capacity Index (ACI) under load



Similarly, the Demand Wettability rates for pulp treated with the two debonders are comparable. Demand Wettability is a measure of how a pulp absorbs liquid at the rate it demands. Clearly, AROSURF® PA-777 behaves similarly to a debonder that has been specifically formulated to maintain absorbency. All of the treated pulps do exhibit a slightly compromised absorbency resulting from the attachment of the hydrophobic debonders to the fiber surfaces.

Figure 4 Demand Wettability rates for a treated pulp



Overall Summary of Test Results

Based on the overall attributes of AROSURF® PA-777, it is clearly evident that it is a product which is highly suited for fluff pulp applications.

Attribute		
Attribute	ADOSURF® PA-777	Competitor A
FDA	Yes	No
VOC	None	Yes
Mullen Burst	Better	Worse
Defibrillation Energy	Better	Worse
Absorbency Capacity index	Equivalent	Equivalent
Demand Wettability	Equivalent	Equivalent

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