



# Excel Erosion Education Circular, Volume - 2 The Excelsior Advantage

## E<sup>3</sup>C Volume 2 - Benefits of Advantages of Excelsior Fibers Excelsior ECBs

E<sup>3</sup>C is produced by Western Excelsior to provide accessible, reliable education regarding erosion control and Rolled Erosion Control Products (RECPs). E<sup>3</sup>C covers an array of topics critical to the RECP industry today. Volume 2 focuses on temporary excelsior blankets and presents the advantages of utilizing excelsior fibers in contrast to other matrix components.

### The Excelsior Story

Utilization of manufactured excelsior fibers to control erosion is one of the longest standing Best Management Practices (BMPs). Excelsior is a machine produced wood fiber, manufactured by shaving aspen or poplar trees. The trees must be debarked and dried and processed to ensure the proper moisture content, length, strength and interlocking of the fiber. Trees harvested for production of Excelsior are typically from over-grown forests that require fuel reduction for safety. The resultant fibers are durable and strong, forming a matrix that is lofty, open, interlocking and stable; ideal for resisting the forces of rainfall or flowing water and establishing vegetation.

Excelsior fibers are produced under a controlled and specified manufacturing process. Thus, fiber diameter, length, strength and moisture content are consistent and controlled at the time of manufacture. Since the fiber dimensions are controlled, the resultant excelsior matrix of the ECB is more consistent in coverage and thickness, compared to straw and coconut/straw blankets. Additionally, aspen fibers are naturally more resistant to degradation than straw fibers. In particular, high altitude Rocky Mountain aspen trees yield excelsior fibers of the highest quality with superior strength, durability, water holding capacity and lighter weight. The advantages of the excelsior fiber, manufactured into a very consistent, open, lofty matrix, yields the highest performing temporary ECBs available.

Performance of ECBs includes reducing erosion on hillslopes and in channels and increasing vegetation establishment rates. Excelsior ECBs provide performance for all three requirements and reduce "tenting" of the material, a function of the open matrix. Excelsior ECBs also function to significantly increase and hold soil moisture, compared to unprotected conditions.

Quantification of the utility of ECBs is achieved by performance testing. For protecting slopes from rainfall, performance is measured by proportional reduction of erosion, compared to identical control plot. For use as a flexible channel liner, the maximum, permissible shear stress of the material quantifies the performance. The material with the highest shear stress is the highest performing material. Finally, the ability to enhance the establishment of vegetation is considered a performance parameter. Figures 1 through 4 present plots of comparative excelsior product performance.



Example of Aspen Trees, Raw Excelsior Fibers and Excelsior ECB

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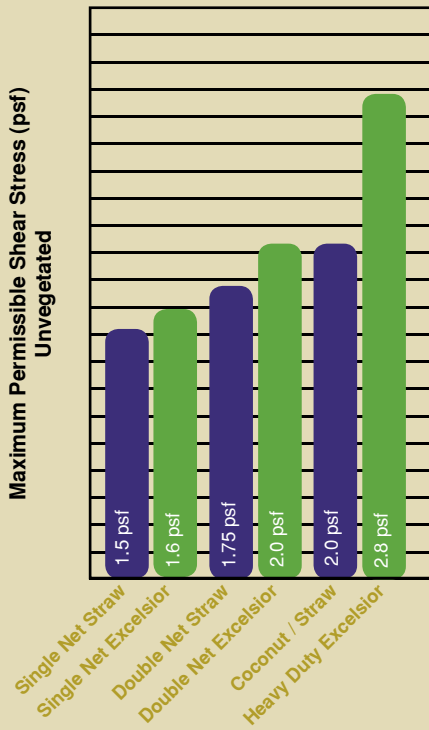
Volume 2



"Blanketing Nature with Nature"

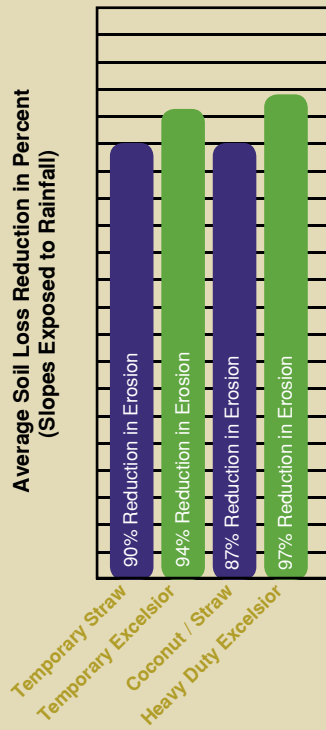
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Figure 1



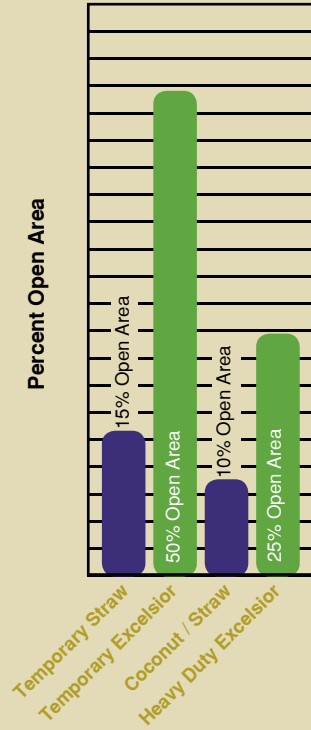
Data shown obtained from Excel and typical products evaluated with state of the practice performance testing in unvegetated, channelized conditions (ASTM D6460). Maximum shear stress corresponds to 0.5 inches of soil loss in half-hour flow events.

Figure 2



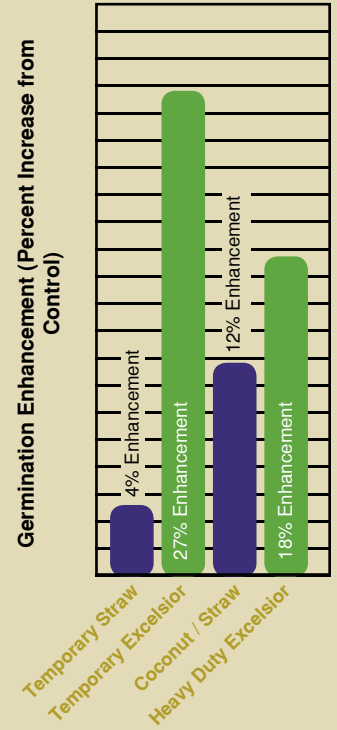
Data shown obtained from Excel products, representative of average, normalized design conditions. Values shown quantify percent erosion reduction compared to control plot derived from full scale performance testing.

Figure 3



Data shown representative of Excel products. Greater open area allows vegetation to establish through the material with less restriction, causing less tenting.

Figure 4



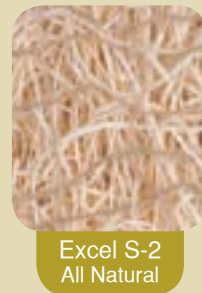
Vegetation enhancement derived from full-scale evaluation of product performance versus greenhouse conditions. Percent improvement shown indicates product vegetation enhancement greater than greenhouse control.

The principle factor contributing to the superior performance of excelsior fiber as an ECB matrix is manufactured quality control. Straw and coconut fibers are harvested or imported and cannot be intensely scrutinized, similar to manufactured fibers. Consistent fiber dimensions yield consistent matrix coverage, and thus, consistent quality and performance. The performance benefit is apparent in Figures 1 through 4.

Western Excelsior manufactures seven excelsior ECBs intended to provide a wide range of options. With rapid degradable, 100% biodegradable, temporary, heavy duty, single net and double net

options, the Excel line of excelsior ECBs offer solutions to a wide variety of erosion challenges. Additionally, all Excel products are laboratory tested and field proven for reliable performance. Western Excelsior also provides industry leading quality control and product warranty. Finally, Excel Erosion Design (available at [www.westernexcelsior.com](http://www.westernexcelsior.com)) utilizes state of the practice design methods to aid in implementation of Excel ECBs.

Considering its origin as logging to reduce forest fire fuel and superior performance, utilizing excelsior for erosion control is truly "Blanketing Nature with Nature".



"Blanketing Nature with Nature"

