Evergreen Nylon Recycling -
Process Description

- Feed Preparation
  - Post Consumer Carpet
  - Post Industrial Waste
- Depolymerization
  - Carpet Melt
- Purification
  - Crude Caprolactam
- Pure Caprolactam
Evergreen Nylon Recycling – History

- June 1998 – The ground breaking of the Evergreen Plant as a JV of AlliedSignal and DSM
- June 1999 - Honeywell and AlliedSignal announce an agreement to merge
- November 1999 - The Evergreen Plant begins operation
- August 2001 - Honeywell and DSM shut down the Evergreen Plant, citing caprolactam market conditions and less than expected output
- September 2005 – Shaw announces the agreement to purchase U.S. nylon carpet fibers business from Honeywell. Shaw acquires a 50% stake in Evergreen Nylon Recycling as part of the deal.
- February 2006 – Shaw acquires the remaining interest in Evergreen Nylon Recycling from DSM
- February 2006 through January 2007 – Shaw and DSM execute a plant rehabilitation and process improvement plan
- February 2007 – The Evergreen Plant begins operation
- April 2007 – The Evergreen Plant has consumed more than 16 lbs of post consumer carpet since the February re-start
Evergreen Nylon Recycling Plant
Evergreen Nylon Recycling - An Initiative of Shaw Green Edge

Progress Driven by Initiatives, not Proclamation

• Product stewardship in action

• Pursuing goals for recycling and reuse of waste carpet

• Reducing the environmental impacts of carpet

www.shawgreeneedge.com – dozens of initiatives and growing
Evergreen Nylon Recycling - An Initiative of Shaw Green Edge

Guided by Shaw Core Values

• Honesty - looking at the environmental and resource challenges
  ➢ Important to develop systems that regard carpet as a resource rather than a waste stream
  ➢ Need for solutions to post consumer waste

• Integrity – commitment to meet those challenges
  ➢ Invested in nylon-6 production
  ➢ Invested in nylon-6 recovery and recycling

• Hard Work – providing real solutions
  ➢ Stepping away from PCC landfill disposal
  ➢ Stepping toward a closed-loop process for our products
Evergreen Nylon Recycling -
An Initiative of Shaw Green Edge

Invested in Long-term Solutions

- Cradle-to-cradle technology – the way to evolve our business toward sufficiency and sustainability
  - Ramp recycling process capacity and collections efforts to track generated PCC volume

- Enterprise of improvement – policy, systems, design, quality of life for employees and customers
  - Shaw’s backward integration – learning curve for operating a chemical facility and collections network
  - Diligent design review and action for process improvement
Evergreen Nylon Recycling –
Closed Loop Recycling
Evergreen Nylon Recycling – Equipment Rehabilitation and Commissioning

- Activity level very high; accomplished task at world class incident rate
- Collaboration with DSM, ASCI, and RBW
- Coordination of production, maintenance, contractors, equipment vendors, and engineers
- Accomplished by systematic procedures of check-out, PM, repair, replacement, and design improvement
- Dry and wet runs of equipment prior to start-up
- DSM’s plant idle procedures were very thorough – system integrity and recovery has been exceptional
Evergreen Nylon Recycling – Process Improvement

- Safety, health, and environment
  - Confident in the operating environment
  - No permit complications or violations
  - Classification and control of unwanted situations; developed and implemented provisions to mitigate risk

- Operational Performance
  - Gaining a good understanding of the process
  - Identifying and pursuing opportunities to excel - on the path of continual improvement
  - Results - achieving goals on consumption, output, and lactam quality
Evergreen Nylon Recycling – Carpet Collection

• Built on Cradle-to-Cradle Philosophy
  ➢ Serving the highest and best use of recycle streams
  ➢ Pulling in more and better sources of sustainable material
  ➢ Evergreen providing the critical mass to anchor the collection of 300 million pounds/yr of carpet of all types

• Carpet Quality Feedback from Evergreen
  ➢ Gaining a good understanding of bale processing
  ➢ Sorting technology a key for identifying and consolidating nylon-6 carpet for Evergreen
  ➢ Testing indicates that content > 98% nylon-6
  ➢ Less foreign material in the bales
  ➢ Bale wire removal and replacement with PET straps translating to improved processing and safety
Evergreen Nylon Recycling –
A Factor in the Market

- **Anso® Nylon (residential)**
  - The longest standing, continuously marketed fiber brand in the residential floor covering industry
  - Among the best fibers available, providing exceptional performance, stain and crush resistance
  - Composed of Nylon 6 that can be recycled back into carpet fiber again and again, endlessly
  - No degradation in performance or limitations in color and styling

- **Eco Solution Q and Zeftron (contract market)**
  - Contains a minimum of 25% recycled content
  - Fully recycled back into carpet fiber through depolymerization
  - Can be recycled in a continuous loop again and again, forever
  - Sets new benchmarks in durability and tensile strength
Evergreen Nylon Recycling - CARE Instrumental in Re-start

• CARE maintains focus on all aspects of recycling:
  ➢ Identification of serious suppliers and outlets
  ➢ Market development opportunities
  ➢ Track and recognize product / process improvements

• Shaw is very pleased to be a part of this effort
  ➢ Inspired to be good stewards of our products
  ➢ Appreciate support for our cradle-to-cradle development