



Recycled Asphalt Shingle Technologies, LLC

Background

- NEI was founded in 1989 and is now the largest producer of self-adhesive underlayments in the U.S.
- NEI successfully introduced post consumer shingles into roofing products in 1998.
- NEI is now a joint venture with Owens Corning.
- RAS-Tech was formed in 2007 and commercialized recycling technology.

RAS-Tech
Proprietary Technology

**Cold
Process**

**Hot
Process**

**4 Patents
Pending**

**4 Patents
Granted**

Hot Process

- Output is hot, liquid filled coating.
- Solids can pass through 200 mesh.
- Can process fiberglass-based, modified products.
- Road crack filler can be produced from scrap shingles and scrap SBS rolls.
- Can convert granule and flake outputs of the “Cold Process” into liquid asphalt.
- Conversion cost is approximately \$25/ton.

Cold Process Outputs

Dust – Granules - Flakes

1. -40 Mesh “Dust”
 - 35% oxidized asphalt & 65% filler.
 - Suitable for use in shingle plants, modified roofing plants, and roof cements and coatings.
 - Conversion cost is approximately \$50/ton.

Cold Process Outputs

2. Granules

- HMA additive.
- Can be cleaned for use as headlap granules.
- Cold Patch.
- Input to “Hot Process”.

3. Flakes

- Curb Mix.
- Fuel - 5000 BTU's / lb.
- Extrusions.
- Input to “Hot Process”.

Rejuvenation Technology

- RAS-Tech's technology will restore aged asphalt back to its original properties.
- The restorative additives used are plant based and recycled materials.



Roof Coatings and Cements

- Produced in the lab but not commercial yet.
- Meets consumer acceptance criterion.
- 50-75% recycled content.

Glass Fiber

- 2% of Weight.
- 9 to 10 times the value of other components.
- Can be used in roof cements, cold patch and curbs.
- Can be cleaned.

Pavement Enhancer Hot Mix Asphalt Additive



- UNH study shows that 10% less virgin asphalt is required to meet NH DOT standards compared to 3/8" chips.
- Approved for use by NH DOT.
- Pike, part of Old Castle, has approved it for use and placed their first order.
- The Margin is approximately \$20-50/ton.

RAS Pavement Enhancer Requires 10% Less Virgin Asphalt than 3/8" Chipped Shingles

Table 2.7: Mixture Gradations, Asphalt Contents

Sieve size mm	% Passing			
	RAP Only Mix	Mix with Normal Ground Shingles	Mix with +50 Mesh Shingles	Mix with -50 Mesh Shingles
37.5 (1 1/2")	100.0	100.0	100.0	100.0
25.0 (1")	100.0	100.0	100.0	100.0
19.0 (3/4")	100.0	100.0	100.0	100.0
12.5 (1/2")	98.7	98.7	98.7	98.7
9.5 (3.8")	86.0	86.0	86.0	86.0
4.75 (#4)	57.9	57.9	57.9	57.9
2.36 (#8)	43.0	43.0	43.0	43.0
1.18 (#16)	32.4	32.4	32.4	32.4
0.6 (#30)	22.6	22.6	22.6	22.6
0.3 (#50)	13.2	13.2	13.2	13.2
0.15 (#100)	5.8	5.8	5.8	5.8
0.075 (#200)	3.2	3.2	3.2	3.2
ac from RAP	0.8%	0.2%	0.2%	0.2%
ac from RAS	0.0%	0.6%	0.6%	0.6%
Virgin ac	4.9%	5.7%	5.2%	5.3%
Total ac	5.7%	6.5%	6.0%	6.1%

Cold Patch



- Market Size is ~\$250-300 million nationally.
- Current producers under stress due to environmental issues.
 - Many facilities can only operate during certain months due to VOC emissions.
 - RAS-Tech product is 90+% recycled & has negligible VOC issues.
- RAS-Tech is currently supplying 4 NH towns.
- Margins will be approximately 40%.

Crack Filler



- Market Size is ~\$100-\$200 million nationally. New England is one of the best markets in the country.
- RAS-Tech advantages:
 - Competition products are made of rubber (SBS), asphalt and mineral filler.
 - Rubber is the most expensive raw material. RAS will reclaim rubber from modified roofing products.
 - RAS will use reclaimed asphalt from shingles.
 - RAS will use recycled oils.
- Margins will be approximately 50%.

Future Products

- Crack Filler (early 2012)
- Laminating Adhesive (2013)
- Foundation Coatings (2013)
- Clean Headlap Granules (2013)
- Roof Cement (2013)
- Roofing Protection Boards (2014)
- Tapered Roof Edge and Cant Strips (2014)
- Fuel out of Saturated Felt Component (2014)

RAS-Tech Plant



- The process is proven and the plant has been operating for a year.
- 10 year contract with NEI - now commercial using both post consumer and post factory scrap.
- 5 year contract with a NE shingle producer for scrap shingle supply.
- Cold patch is now commercial with 4 NH towns.

Equipment Cost

- ~\$500,000 for basic processing unit.
 - Coating Additive
 - Cold Patch Additive
 - Pavement Enhancer
- Additional product capabilities would be extra.

Licensing Opportunities

- All major roofing manufacturers have shown interest and two are in advanced testing.
- Traditional Shingle Recyclers – Limited Exclusive Licensing Opportunities.

THANK YOU !



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