

Asphalt Rubber Hot Mix and Recycled Pavement Products

Ross Kashiwagi
Granite Construction Company
ross.kashiwagi@gcinc.com

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We will cover:

- Asphalt Rubber Hot Mix
- RAP = Reclaimed Asphalt Pavement
- RAS = Recycled Asphalt Shingles
- WMA = Warm Mix Asphalt

Definitions

- HMA = Hot Mix Asphalt
- ARHM (RAC) = Asphalt Rubber Hot Mix / Rubberized Asphalt Concrete
- RAP = Reclaimed Asphalt Pavement
- Virgin aggregate = New Aggregates
- RAS = Recycled Asphalt Shingles
- Virgin Binder = New Binder

Asphalt Rubber Hot Mix

Ground Tire Rubber is blended with hot liquid asphalt and sent to a reaction vessel before it is mixed with aggregates and sand.



The "Rubber Plant"



Why Asphalt Rubber?

- Rubber is “Green”
 - Every ton of Asphalt rubber uses 3 tires.
 - A typical 2” overlay uses approx. 2000 tires per lane mile
- Resistance to cracking
 - Resists thermal and reflective cracking
 - Used extensively for maintenance paving



Why Asphalt Rubber?

- Sound Reduction
 - Lowest decibels across the board
- Safety
 - Excellent skid resistance
 - Gap graded mix mitigates rain hazards



Why Asphalt Rubber?

- Quality
 - Higher binder content
 - Greater Durability
 - Better Aging Properties
 - Handles temp changes better than conventional



- Cost Effective
 - Overlay vs. reconstruct
 - Longevity



RAP

Recycled Asphalt Pavements

Recycling Rates by Category

- 64% Scrap Steel
- 60% Aluminum Cans
- 56% Newspapers
- 37% Plastic Soft Drink Bottles
- 31% Glass Beverage Containers
- 23% Magazines
- 90% Asphalt Pavement

RAP Statistics

- The #1 most recycled material*
 - 66.7 million tons of RAP used in 2011
 - 19 million barrels (3.3M tons) of virgin asphalt conserved
 - 63.4 million tons of virgin aggregate conserved
- Caltrans allows up to 25% RAP in mix

* Source: *2nd Annual Asphalt Pavement Industry Survey on Reclaimed Asphalt Pavement, Reclaimed Asphalt Shingles, and Warm-Mix Asphalt Usage: 2009-2011*; National Asphalt Pavement Association

RAP is brought to the Asphalt Plant location, crushed and screened, tested, and added to Hot Mix



Why RAP?

- Landfill Diversion
- Reduces Cost to Agencies
 - Competitive Bids
- Reduces consumption of natural resources
 - Aggregate
 - Oil
- Reduces energy consumption
 - Hauling virgin aggregates
 - Aggregate production



RAS

Recycled Asphalt Shingles

RAS Statistics

- 1.2 Million tons of RAS used in 2011*
 - 2.2 million barrels (380K tons) of virgin asphalt conserved
- Caltrans is working on a specificatiton to allow RAS in hot mix asphalt

* Source: *2nd Annual Asphalt Pavement Industry Survey on Reclaimed Asphalt Pavement, Reclaimed Asphalt Shingles, and Warm-Mix Asphalt Usage: 2009-2011*; National Asphalt Pavement Association

RAS is generated from manufacturers' waste or post-consumer shingles, crushed and screened, tested, and added to Hot Mix



Warm Mix Asphalt

What is WMA?

- Warm Mix Asphalt
 - Like HMA, but Cooler
 - Typically 212-250°F vs 250-320°F
 - Many WMA Technologies
 - Produced with minor plant modifications
 - Placed with Conventional Equipment
 - Many Benefits over HMA

WMA Environmental Benefits

- Reduces Fuel Consumption Avg. 20% (NAPA)
- RAP (Reclaimed Asphalt Pavement) Friendly
- Reduces Odors at Plant and Paving Site
- Reduces Temperatures at Paving Site
- Reduces Greenhouse Gas Avg. 10% (NAPA)
- Reduces Plant Emissions



WMA Paving Benefits

- Equal or Better Compactability
- Longer Haul Potential
- Cooler Weather Paving Potential



Reduced Emissions

Astec Double Barrel Green

HMA	WMA
Temp = 320°F	Temp = 270°F



WMA Statistics

- 69 Million tons of WMA produced in 2011*
- Caltrans working on WMA implementation
 - Improved Performance (in place air voids)
 - Sustainability
 - Governors Climate Action Plan

* Source: *2nd Annual Asphalt Pavement Industry Survey on Reclaimed Asphalt Pavement, Reclaimed Asphalt Shingles, and Warm-Mix Asphalt Usage: 2009-2011*; National Asphalt Pavement Association

Granite Pleasanton Plant, CA



Questions?

