

Recycled Asphalt Shingles (RAS)

1. Identification

| | |
|------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Product name: Recycled Asphalt Shingles | |
| Other means of identification/Synonyms/Common Names: none | |
| Recommended use: Asphalt shingles and felt roofing product(s) crushed to a fine gradation to be used in Hot Mix Asphalt | |
| Recommended restrictions: None Known | |
| Manufacturer/Contact info: Vulcan Materials Company and its subsidiaries and affiliates 1200 Urban Center Drive Birmingham, AL 35242 | General Phone Number: 1.866.401.5424 Emergency Phone Number: 1.866.401.5424 (3E Company, 24hours/day, 7 Days/week) Website: www.vulcanmaterials.com |

2. Hazard(s) Identification

| | |
|--------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Physical hazards: Not Classified | Health hazards: Carcinogenicity-Category 1A Specific target organ toxicity, repeated exposure-Category 2 Eye irritation – Category 2B (mild irritant) Skin irritation – Category 2 (mild irritant) |
| Signal word: Danger | Hazard statement: May cause cancer (Inhalation) Suspected of damaging the unborn child Causes damage to organs (lung/respiratory system) through prolonged or repeated exposure (inhalation) May cause temporary upper respiratory tract irritation May cause mild skin irritation May cause mild eye irritation |



Precautionary statement:

Prevention

- Obtain special instructions before use. Do not handle until all safety precautions have been read and understood.
- Do not breathe dust, fume, or vapors. Use only outdoors or in a well ventilated area.
- Wash hands thoroughly after handling
- Use personal protective equipment as required. Wear protective gloves, protective clothing, eye protection, and face protection.

- Do not eat, drink or smoke when using this product.
- Wear protective gloves/protective clothing/eye protection/face protection.

Response

- If exposed or concerned: Get medical advice/attention
- If skin irritation occurs: Get medical advice/attention
- Specific treatment (see the following information on this label)
- IF ON SKIN: Wash with plenty of water.
- Take off contaminated clothing and wash it before reuse.

Disposal

- Dispose of contents/container in accordance with all local, regional, national, and international regulations.

Supplemental information:

Respirable Crystalline Silica (RCS) may cause cancer. Limestone aggregates and mineral granules are naturally occurring mineral complex that contains varying quantities of quartz (crystalline silica). Limestone aggregates and mineral granules may be subjected to various natural or mechanical forces that produce small particles (dust) which may contain respirable crystalline silica (particles less than 10 micrometers in aerodynamic diameter). Repeated inhalation of respirable crystalline silica (quartz) may cause lung cancer according to IARC, NTP; ACGIH states that it is a suspected cause of cancer. Other forms of RCS (e.g., tridymite and cristobalite) may also be present or formed under certain industrial processes.

3. Composition/information on ingredients

| Chemical name | CAS number | % |
|-------------------------------|------------|------|
| Aggregate (limestone) | 1317-65-3 | <50 |
| * Quartz (crystalline silica) | 14808-60-7 | >1 |
| Oxidized Asphalt | 64742-93-4 | <30 |
| Mineral Granules* | NE | <40 |
| Glass Mat Fiber | NE | <20 |
| Glass Fibers | 65997-17-3 | <10 |
| Urea Formaldehyde | 9011-05-6 | >0.1 |
| Binder Formaldehyde | 50-00-0 | <0.1 |
| Backing Sand* | 14808-60-7 | <10 |
| Talc* | 14807-96-6 | <10 |
| Felt | NE | <30 |

NE = Not Established

4. First-aid measures

Inhalation:

Remove person to fresh air. If lung irritation persists or later develops, contact a physician. If not breathing, initiate rescue breathing, give oxygen by trained personnel and get immediate medical attention. Do not attempt to rescue victim from confined spaces without adequate protective equipment.

Eyes:

Immediately flush eye(s) with plenty of clean water for at least 15 minutes, while holding the eyelid(s) open. Occasionally lift the eyelid(s) to ensure thorough rinsing. Beyond flushing, do not attempt to remove material from eye(s). Contact a physician if irritation persists or later develops.

Skin:

Not expected to be a significant exposure route. Clean exposed skin with soap or mild detergent and large amounts of water until all material is removed from the skin. Do not use solvents or thinners to remove material from skin.

Ingestion:

If swallowed, do not induce vomiting. Drink a large volume of water and get immediate medical attention. Never give anything by mouth to an unconscious person. If vomiting occurs, keep head lower than hips to prevent aspiration.

Most important symptoms/effects, acute and delayed:

Dust particles can scratch and irritate the skin with redness, an itching or burning sensation, swelling of the skin and/or rash. Dust may irritate the eyes, skin, and respiratory tract. Breathing respirable crystalline silica-containing dust for prolonged periods in the workplace can cause lung damage and a lung disease called silicosis. Symptoms of

silicosis may include (but are not limited to) shortness of breath, difficulty breathing with or without exertion; coughing; diminished work capacity; diminished chest expansion; reduction of lung volume; right heart enlargement and/or failure. Unconsciousness and asphyxiation may occur in poorly ventilated or confined spaces. **Note:** Since this product is not sold heated, exposure to asphalt emissions (fumes, vapors, or mists) are expected to be minimal. Potential for exposure increases if product comes in contact with heated surfaces or is heated.

Indication of immediate medical attention and special treatment needed:

Not all individuals with silicosis will exhibit symptoms of the disease. However, silicosis can be progressive and symptoms can appear even years after exposures have ceased. Persons with silicosis have an increased risk of pulmonary tuberculosis infection.

For emergencies contact 3E Company at 1.866.401.5424 (24 hours/day, 7 days/week).

5. Fire-fighting measures

Suitable extinguishing media:

Agents approved for Class B hazards (e.g., dry chemical, carbon dioxide, halogenated agents, foam, and steam) and water fog.

Unsuitable extinguishing media:

Avoid use of straight-stream water. Adding water to hot asphalt presents an explosion hazard.

Specific hazards arising from the chemical:

Do not heat above flash point. Fumes/vapors can explode when concentrated in an enclosed environment and supplied with an ignition source. Never weld or use a cutting torch or open flame on a full, partially full or empty bin, hopper, or other container that holds or has held asphaltic material unless precautions are taken to prevent explosion. **WARNING:** Hydrogen sulfide (H₂S) and other hazardous gases/vapors may evolve and collect in the headspace of storage tanks or other enclosed vessels, and can create an explosive, toxic, or oxygen deficient atmosphere. H₂S gas is extremely flammable and can explode if an ignition source is provided. See Section 11 for health effects of H₂S gas.

Special protective equipment and precautions for firefighters:

Avoid breathing irritating and potentially toxic fumes, including hydrogen sulfide gas. Firefighters should wear NIOSH/MSHA approved positive pressure breathing apparatus (SCBA) with full face mask and full protective equipment.

Fire-fighting equipment/instructions:

Adding water to hot asphalt presents an explosion hazard.

Specific methods:

Use water spray to keep fire-exposed containers cool.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures:

Pick up large pieces. Do not dry sweep spilled material as the spilled dust may contain crystalline quartz silica. Do not use compressed air to remove settled dust. Collect the material using a method that does not produce dust such as a vacuum cleaner equipped with a High-Efficiency Particulate Air (HEPA) filter or thoroughly wet down the dust before cleaning up. Do not burn. Prevent materials from entering streams, drainages, or sewers. Spills entering surface waters (or any other watercourse or sewers entering/leading to surface waters) must be reported to the National Response Center 800-424-8802.

For emergencies, contact 3E Company at 1-866-401-5424 (24 hours/day, 7 days/week).

Environmental precautions:

Contain spilled material with sand, aggregate fines, or other inert adsorbent. Collect adsorbed product and clean up materials in appropriate container for proper disposal. Notify proper authorities.

Methods and materials for containment and cleaning up:

Dispose of waste materials in accordance with applicable federal, state and local laws and regulations.

7. Handling and storage

Precautions for safe handling:

Follow personal protection and protective controls set forth in Section 8 of this SDS when handling this product. If personnel must enter a tank or other confined space that contained this material, follow the OSHA Confined Space

Entry Program as specified in 29 CFR 1910.146. Do not store near food, beverages or smoking materials. Respirable crystalline silica-containing dust may be generated when recycled asphalt shingles is subjected to mechanical forces, such as demolition work, surface treatment (sanding, grooving, chiseling, etc.), and/or recycling of pavement. Do not attempt to clean empty containers since residue is difficult to remove. Do not pressurize, cut, weld, braze, solder, drill, grind or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition as they may explode and cause injury or death.

Conditions for safe storage, including any incompatibilities:

Store away from all ignition sources and open flames in accordance with applicable laws and regulations. When petroleum asphalt products are heated, potentially irritating emissions (fumes, mists, and vapors) may be released.

8. Exposure controls/personal protection

Legend:

NE = Not Established; PEL = Permissible Exposure Limit; TLV = Threshold Limit Value; REL = Recommended Exposure Limit; OSHA = Occupational Safety and Health Administration; MSHA = Mine Safety and Health Administration; NIOSH = National Institute for Occupational Safety and Health; ACGIH = American Conference of Governmental Industrial Hygienists

| Component | OSHA/MSHA PEL | ACGIH TLV | NIOSH REL |
|---------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|------------------------------------|
| Particulates not otherwise classified | 15 mg/m ³ (total dust) 5 mg/m ³ (respirable fraction) | 10 mg/m ³ (inhalable fraction) 3 mg/m ³ (respirable fraction) | NE |
| Respirable dust containing silica | 10 mg/m ³ ÷ (% silica + 2) | Use Respirable Silica TLV | Use Respirable Silica TLV |
| Total dust containing silica | MSHA: 30 mg/m ³ ÷ (% silica + 3) | NE | NE |
| Respirable Crystalline Silica (quartz) | OSHA: 0.05 mg/m ³ (PEL) OSHA: 0.025 mg/m ³ (Action Level) MSHA: Use Respirable Dust containing Silica PEL (above) | 0.025 mg/m ³ | 0.05 mg/m ³ |
| Respirable Tridymite and Cristobalite (other forms of crystalline silica) | OSHA: Use respirable crystalline silica PEL MSHA: 1/2 of respirable dust containing silica PEL | 0.025 mg/m ³ | 0.05 mg/m ³ |
| Glass Fiber – Wool (fiberglass) | 1 fiber/cubic centimeter: respirable | 1 fiber/ cubic centimeter; respirable | 5 total fibers |
| Oxidized Asphalt | NE | 0.5 (inhalable fraction, as benzene-soluble aerosol) | 5 Ceiling (15 minutes as fume) |
| Titanium Dioxide | 15 mg/m ³ – total | 10 mg/m ³ – total | REL: lowest feasible concentration |

Exposure Guidelines:

Total dust containing silica, respirable silica-containing dust and respirable crystalline silica (quartz) levels should be monitored regularly to determine worker exposure levels. Exposure levels in excess of allowable exposure limits should be reduced by all feasible engineering controls, including (but not limited to) wet suppression, ventilation, process enclosure, and enclosed employee workstations.

Engineering Controls:

Activities with dried/hardened product that generate dust require the use of general ventilation, local exhaust and/or wet suppression methods to maintain exposures below appropriate exposure limits.

Eye Protection:

Safety glasses with side shields should be worn as minimum protection at ambient temperatures. Contact lens should not be worn when eye contact with product is possible.

Skin Protection (Protective Gloves/Clothing):

Avoid skin contact with material by wearing impervious gloves and protective clothing. With product at ambient temperatures, use disposable nitrile, neoprene or butyl rubber material.

Respiratory Protection:

Not expected to be necessary under normal use and working conditions. All respirators must be NIOSH-approved for the exposure levels present. (See NIOSH Respirator Selection Guide). The need for respiratory protection should be evaluated by a qualified safety and health professional. For air-contaminant concentrations which exceed or are likely to exceed applicable exposure limits, use a NIOSH-approved, contaminant-specific, air purifying respirator. If such conditions are sufficiently high that the air-purifying respirator is inadequate, or if oxygen adequate to sustain life is not present, use a positive-pressure, self-contained breathing apparatus. Activities that generate dust require the use of an appropriate dust respirator where dust levels exceed or are likely to exceed allowable exposure limits. For respirable silica-containing dust levels that exceed or are likely to exceed an 8-hour time-weighted average (TWA) of 0.25 mg/m³, a high efficiency particulate filter respirator must be worn at a minimum; however, if respirable silica-containing dust levels exceed or are likely to exceed an 8-hour TWA of 1.25 mg/m³ an air-purifying, full-face respirator or equivalent is required. Respirator use must comply with applicable MSHA (42 CFR 84) or OSHA (29 CFR 1910.134) standards, which include provisions for a user training program, respirator inspection, repair and cleaning, respirator fit testing, medical surveillance and other requirements.

9. Physical and chemical properties

Appearance:

Black moist powder.

| | | |
|------------------------------------------------------------------|-------------------------------------------------------------------|------------------------------------------------------------------------|
| Odor: Petroleum odor. | PH: Not applicable | Decomposition temperature: Not applicable |
| Melting point/freezing point: >200°F | Initial boiling point and boiling range: Not applicable | Flash point: Product NA |
| Evaporation rate: Not applicable | Flammability: Not applicable | Upper/lower flammability or explosive limits: Not applicable |
| Vapor pressure: Not applicable | Vapor density: >1 | Solubility: Negligible |
| Partition coefficient: n-octanol/water. Not applicable | Autoignition temperature: >460°C/860°F | Specific Gravity (H₂O = 1): Variable |

10. Stability and reactivity

Reactivity:

Not reactive under normal use.

Chemical stability:

Stable under normal temperatures and pressures.

Possibility of hazardous reactions:

None under normal use.

Conditions to avoid (e.g., static discharge, shock or vibration):

Keep away from direct flame/ignition sources. Contact with incompatible materials should be avoided (see below). See Sections 5, 6 and 7 for additional information.

Incompatible materials:

Strong oxidizers may react with hydrocarbons. Contact with fluorine may cause burning or explosion. Adding water to hot asphalt presents an explosion hazard.

Hazardous decomposition products:

Carbon monoxide and other compounds (such as amines, ammonia, nitrogen dioxide, sulfur dioxide, ozone, hydrogen sulfide, and various hydrocarbons) may be released by thermal decomposition. Hazardous vapors can collect in enclosed vessels or areas if not properly ventilated. If hydrogen sulfide is present, the flammable limits range from 4.3 to 45.5% by volume and its presence may promote the formation of pyrophoric (spontaneously igniting) iron compounds (See 29 CFR 1910.146). Respirable crystalline silica-containing dust may be generated. When heated, quartz is slowly transformed into tridymite (above 860°C/1580°F) and cristobalite (above 1470°C/2678°F). Both tridymite and cristobalite are other forms of crystalline silica.

| |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 11. Toxicological information |
| Primary Routes of Exposure: Inhalation and contact with the eyes and skin. |
| Symptoms related to the physical, chemical, toxicological characteristics Inhalation: Breathing silica containing dust for prolonged periods in the workplace can cause lung damage and lung disease called silicosis. Several scientific organizations have classified crystalline silica as causing lung cancer in humans. Silicosis and lung cancer can result in permanent injury or death. |
| Eye Contact: May scratch the eye causing tearing, redness and a stinging sensation. |
| Skin Contact: Repeated or prolonged exposure may result in absorption of component petroleum distillates. |
| Ingestion: Asphalt has a low toxicity when ingested; however, chewing and swallowing asphalt may cause gastrointestinal effects. Gastric masses (Bezoars) and stomach (pyloric) obstructions have been reported in individuals who have chewed and swallowed asphalt. |
| Medical Conditions Aggravated by Exposure: Pre-existing medical conditions that may be aggravated by exposure include disorders of the eye, skin and/or lung. |
| Delayed and immediate effects and also chronic effects from short- and long-term exposure: If the product is subjected to mechanical forces (such as demolition or asphalt recycling work), crystalline silica-containing dust particles may be generated. Prolonged overexposure to respirable dusts in excess of allowable exposure limits can cause inflammation of the lungs leading to possible fibrotic changes, a medical condition known as pneumoconiosis. Prolonged and repeated overexposure to high levels of respirable crystalline silica-containing dust may cause a chronic form of silicosis, an incurable lung disease that may result in permanent lung damage or death. Chronic silicosis generally occurs after 10 years or more of overexposure; a more accelerated type of silicosis may occur between 5 and 10 years of higher levels of prolonged and repeated overexposure. In early stages of silicosis, not all individuals will exhibit symptoms (signs) of the disease. However, silicosis can be progressive, and symptoms can appear at any time, even years after exposure has ceased. Repeated overexposures to very high levels of respirable crystalline silica for periods as short as six months may cause acute silicosis. Acute silicosis is a rapidly progressive, incurable lung disease that is typically fatal. Symptoms include (but are not limited to): shortness of breath, cough, fever, weight loss, and chest pain. Respirable dust containing newly broken crystalline silica particles has been shown to be more hazardous to animals in laboratory tests than respirable dust containing older crystalline silica particles of similar size. Respirable crystalline silica particles which had aged for sixty days or more showed less lung injury in animals than equal exposures to respirable dust containing newly broken particles of respirable crystalline silica. There are reports in the literature suggesting that excessive respirable crystalline silica exposure may be associated with autoimmune disorders and other adverse health effects involving the kidney. In particular, the incidence of scleroderma (thickening of the skin caused by swelling and thickening of fibrous tissue) appears to be higher in silicotic individuals. To date, the evidence does not conclusively determine a causal relationship between silica exposure and these adverse health effects. |
| Carcinogenicity: If the product is subjected to mechanical forces (such as demolition or asphalt recycling work), crystalline silica-containing dust particles may be generated. Epidemiology studies on the association between respirable crystalline silica exposure and lung cancer have had both positive and negative results. There is some speculation that the source, type, and level of exposure of respirable crystalline silica may play a role. Studies of persons with silicosis indicate an increased risk of developing lung cancer, a risk that increases with the level and duration of exposure. It is not clear whether lung cancer develops in non-silicotic patients. Several studies of silicotics do not account for lung cancer confounders, especially smoking, which have been shown to increase the risk of developing lung disorders, including emphysema and lung cancer. In October 1996, an IARC Working Group designated respirable crystalline silica as carcinogenic (Group 1). In 2012, an IARC Working Group re-affirmed that inhalation of crystalline silica was a known human carcinogen. The NTP's Report |

on Carcinogens, 9th edition, lists respirable crystalline silica as a "known human carcinogen." In the year 2000, the American Conference of Governmental Industrial Hygienists (ACGIH) listed respirable crystalline silica (quartz) as a suspected human carcinogen (A-2). These classifications are based on sufficient evidence of carcinogenicity in certain experimental animals and on selected epidemiological studies of workers exposed to respirable crystalline silica. Repeated breathing of asphalt emissions has not resulted in a carcinogenic response in laboratory animal testing. Although epidemiological studies on asphalt workers have suggested a possible link between asphalt fumes and certain types of cancer, confounding factors such as smoking and concomitant exposure to other agents in the workplace may have influenced the results of these studies. Asphalt is not listed as a carcinogen by the National Toxicology Program (NTP) or the Occupational Safety and Health Administration (OSHA). IARC states that there is sufficient evidence that extracts (asphalts dissolved in hydrocarbon solvents) are carcinogenic to laboratory animals and recently the agency determined that occupational exposures to oxidized asphalt and their emissions during roofing applications are "probably carcinogenic to humans" (Group 2A). They also determined that occupational exposures to hard asphalts and their emissions during mastic asphalt work and occupational exposures to straight-run asphalts and their emissions during paving operations are "possibly carcinogenic to humans" (Group 2B).

Additional information on toxicological-effects:

Acute toxicity: Not classified

No specific data on product. Based on components, not expected to be classified for acute toxicity.

Asphalt:

Acute Oral, rat: LD50 >5000 mg/kg

Acute Dermal, rat: LD50 >2000 mg/kg

Skin corrosion/irritation: May cause

Serious eye damage/eye irritation: May cause

Respiratory sensitization: Not Classified

Germ cell Mutagenicity: Not Classified

Carcinogenicity: May cause cancer (Inhalation)

Reproductive toxicity: Not Classified

Specific target organ toxicity - single exposure: Not Classified

Specific target organ- toxicity – repeated exposure: Causes damage to organs (lungs, respiratory system) through prolonged or repeated exposure (inhalation)

Aspiration toxicity: Not Classified (not applicable- solid material)

12. Ecological information

Ecotoxicity (aquatic and terrestrial, where available):

No specific data on this product.

Persistence and degradability:

Expected to be resistant to biodegradation.

Bioaccumulative potential.

Significant migration into the environment and bioaccumulation are unlikely.

Mobility in soil.

Not determined

Other adverse effects.

Not determined

13. Disposal considerations

Safe handling and disposal of waste:

Place contaminated materials in appropriate containers and dispose of in a manner consistent with applicable federal, state, and local regulations. Prevent from entering drainage, sewer systems, and unintended bodies of water. It is

the responsibility of the user to determine, at the time of disposal, whether product meets criteria for hazardous waste. Product uses, transformations, mixture and processes, may render the resulting material hazardous.

14. Transport information

UN Number:

Not regulated.

UN Proper shipping name:

Not regulated.

Transport Hazard class:

Not applicable.

Packing group, if applicable:

Not applicable.

Marine pollutant (Yes/No):

Not applicable.

15. Regulatory information

Toxic Substances Control Act (TSCA):

The components in this product are listed on the TSCA Inventory or are exempt.

Comprehensive Environmental Response, Compensation and Liability Act (CERCLA):

Releases of this material to water may be reportable to the National Response Center under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) or to state and local emergency planning committees under the Superfund Amendments and Reauthorization Act. (See Section 6)

Superfund Amendments and Reauthorization Act of 1986 (SARA), Title III:

Section 302 extremely hazardous substances: None

Section 311/312 hazard categories: Delayed Health

Section 313 reportable ingredients at or above de minimus concentrations: None

California Proposition 65:

This product contains a chemical (crystalline silica, bitumen, various aromatic hydrocarbons) known to the State of California to cause cancer and birth defects or other reproductive harm.

State Regulatory Lists:

Each state may promulgate standards more stringent than the federal government. This section cannot encompass an inclusive list or all state or local regulations. Therefore, the user should review the components listed in Section 2 and consult state or local authorities for specific regulations that apply.

16. Other information

Disclaimer

NO WARRANTY IS MADE, EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OTHERWISE.

Vulcan Materials Company and its subsidiaries and affiliates ("Vulcan") believe the information contained herein is accurate; however, Vulcan makes no guarantees with respect to such accuracy and assumes no liability whatsoever in connection with the use of any information contained herein by any party. The provision of the information contained herein is not intended to be, and should not be construed as, legal advice or as ensuring compliance with any federal, state, or local laws, rules or regulations. Any party using any information contained herein should review all applicable laws, rules and regulations prior to use.

Issue date:

12/03/2019

Revision date:

12/03/2019

**Vulcan Materials Company and its subsidiaries and affiliates
1200 Urban Center Drive**

Birmingham, AL 35242