

RD FRESH TECHNICAL INFORMATION

This document provides comprehensive technical, safety, and regulatory validation for prospective clients evaluating **RD Fresh** systems for commercial refrigeration and food preservation environments.

The RD Fresh system utilizes a proprietary blend of natural, earth-born minerals enclosed in premium DuPont™ Tyvek® packaging. Below are 3rd party tested and verified scientific and compliance data demonstrating that the system is non-hazardous, chemically stable, and approved for direct food contact.

Material Safety Matrix

Activated Carbon	Chabazite	Clinoptilolite	Montmorillonite	Tyvek® Envelope
Chemical Name: Carbon (Powdered/ Granular)	Chemical Name: Sodium Aluminosilicate Mineral	Chemical Name: Potassium- Calcium-Sodium- Aluminosilicate	Chemical Name: Crystalline Powder Mineral	Chemical Name: Spunbonded Olefin
Regulatory Classification: Non-Hazardous (29 CFR 1910)	Regulatory Classification: Not Regulated by DOT	Regulatory Classification: Non-Hazardous Dry Freight	Regulatory Classification: Non-Hazardous (RCRA 40 CFR 261)	Regulatory Classification: TSCA Compliant "Article"
Primary Safety & Stability Profile: Odorless, insoluble solid; zero health or physical hazards. 	Primary Safety & Stability Profile: Chemically stable mineral; NFPA Rating: Health 1, Flammability 0, Reactivity 0. 	Primary Safety & Stability Profile: Completely non- combustible; presents zero occupational or exposure risks. 	Primary Safety & Stability Profile: Non-combustible; not listed as a carcinogen by NTP or IARC. 	Primary Safety & Stability Profile: Inert synthetic nonwoven sheet with neutral pH (pH = 7) and superior liquid barrier protection. 

Executive Summary

- **Safety Profile:** 100% non-hazardous, non-toxic, and non-carcinogenic.
- **Food Safety Certification:** Packaged in FDA-compliant material approved for direct food contact under 21 CFR 177.1520.
- **Regulatory Status:** Exempt from hazardous classification under OSHA, DOT, RCRA, and TSCA frameworks.
- **Environmental Impact:** No ozone-depleting chemicals, no aquatic toxicity, and safe for standard landfill disposal.

Regulatory & FDA Validation for Direct Food Contact

Corporate quality assurance teams can deploy RD Fresh with total confidence regarding food safety compliance.

FDA Compliance Verification (21 CFR 177.1520): The exterior Tyvek® packaging (Styles 1059B and 1073B) fully meets the requirements of Title 21 of the United States Code of Federal Regulations for direct food contact applications. This validation covers active packaging, desiccants, food packaging, and direct contact labeling. It remains fully stable in food environments where temperatures do not exceed 212°F (100°C).

Additional Packaging Integrity Highlights:

- **Low-Linting Technology:** Because the packaging is engineered from continuous synthetic fibers, it does not generate significant lint particles under ordinary use, preserving clean-room and food-surface integrity.
- **Outstanding Chemical Resistance:** The outer shield is inert to most acids, bases, and salts.
- **Moisture Independence:** Physical properties and material strength remain completely unaffected by water or high-humidity environments—the packaging is equally strong wet or dry.
- **Toxicity Screening:** The material has undergone comprehensive skin contact testing on both animals and humans with zero reported toxic or adverse reactions.

Physical, Thermal, and Fire Safety Data

The mineral core and packaging are engineered to withstand extreme commercial kitchen and cold-chain logistics environments without risking structural failure or combustion.

- **Extreme Temperature Resilience:** Packaging toughness and flexibility are structurally retained down to -100°F (-73°C), making it ideal for deep-freeze commercial applications.
- **High Thermal Melting Points:** The core minerals feature extraordinary thermal limits, such as Clinoptilolite with a melting point of 1800°F. The outer packaging begins to shrink at 270°F (132°C) and melts at 275°F (135°C).
- **Non-Combustible Core:** The active mineral components are completely non-combustible as supplied and do not support combustion.
- **Structural Stability:** The dimensional footprint of the packaging changes by less than 0.01% between 0% and 100% relative humidity, ensuring no stretching or sagging inside humid walk-in coolers.

Environmental & Ecological Footprint

RD Fresh aligns seamlessly with corporate sustainability and ESG mandates.

- **Zero Atmospheric Impact:** Contains absolutely no ozone-depleting substances.
- **Aquatic and Wildlife Safety:** Testing indicates no known waterfowl or aquatic toxicity.
- **No Bioaccumulation:** The components exhibit no food chain concentration potential.
- **Biochemical Oxygen Demand (BOD):** The active minerals are not biodegradable, meaning they do not pull oxygen from local water systems or ecosystems.
- **Streamlined Disposal:** Unused material is classified as non-hazardous under RCRA regulations and can be safely disposed of in standard municipal landfills. (Note: Once used, the product may absorb ambient elements from your specific environment and should be discarded in accordance with standard local regulations.)