



## BENZOIC ACID

FORMULA:  $C_6H_5COOH$  (C<sub>7</sub>H<sub>6</sub>O<sub>2</sub>) MOLECULAR WEIGHT: 122.12

CAS REGISTRATION NUMBER: 65-85-0 EINECS REG. NUMBER: 200-618-2

GRADE AVAILABLE: TECHNICAL, E-210

**USES:** The Technical grade of Benzoic Acid is used as an intermediate in the manufacture of chemicals, alkyd resins, polyesters, plasticizers, dyestuffs, preservatives, and rubber activators and retardants, and as a diverting agent in crude oil recovery applications.

### TYPICAL PHYSICAL PROPERTIES OF BENZOIC ACID:

BOILING POINT	@ 760 mm Hg	249° C
	@ 100 mm Hg	186° C
MELTING POINT	122.4° C	
SPECIFIC GRAVITY	d 24/4 (solid)	1.32
	d 180/4 (liquid)	1.03
DENSITY	8.75 # / gallon	@ 155° C
REFRACTIVE INDEX	1.54	@ 132° C
FLASH POINT (T.C.C.)	121° C (250° F)	
AUTOIGNITION TEMPERATURE	573° C (1063° F)	
VAPOR PRESSURE	10 mm Hg	@ 132.1° C
	60 mm Hg	@ 172.8° C
	100 mm Hg	@ 186.2° C
	400 mm Hg	@ 227° C
VAPOR PRESSURE EQUATION	Log P = A - (B/ t+ C)	A = 8.57134 B = 2726.2 C = 230 t = ° C P = mm Hg
SOLUBILITY IN WATER	0.35 grams / 100 grams of water	@ 25° C
HEAT OF VAPORIZATION	230 BTU / #	@ 140° C
	183 BTU / #	@ 249° C
SPECIFIC HEAT	0.90 BTU / # / °C	@ 130° C
	0.97 BTU / # / °C	@ 160° C
	1.06 BTU / # / °C	@ 200° C
HEAT OF FUSION	63.4 BTU / #	@ 122° C
HEAT OF COMBUSTION	11,370 BTU / #	@ 25° C
VISCOSITY	1.2 Centipoise	@ 130° C
	0.3 Centipoise	@ 177° C

*(The above properties are typical of BENZOIC ACID, but should not be confused with, or regarded as, Product Sales Specifications.)*

## FORMS AVAILABLE: CHIPS

### CONTAINERS:

- a) CHIPS are shipped in polyethylene lined paper bags, each containing 25 Kg of product. Forty bags are placed upon a non-returnable pallet (4-way entry type). The pallet and bags are then "shrink-wrapped" with polyethylene film.
- b) CHIPS are also shipped in groundable (antistatic-type) woven polypropylene flexible intermediate bulk containers (FIBCs), each containing 500 kG (1,102 #) of product. Each FIBC is placed upon a non-returnable pallet (4 way entry type). The pallet and FIBC are then "shrink-wrapped" with polyethylene film.
- c) For information regarding MOLTEN BENZOIC ACID, contact your Emerald Kalama Chemical Sales Representative.

**SAFETY:** A Material Safety Data Sheet (MSDS) is available for Benzoic Acid.

### HANDLING BENZOIC ACID:

***MOLTEN BENZOIC ACID:*** Due to its high melting point, (122°C or 252°F), the handling of molten benzoic acid can result in thermal burns. The use of full protective clothing, including face shield, goggles, helmet, jacket, pants, and boots is highly recommended.

***UNLOADING FLEXIBLE INTERMEDIATE BULK CONTAINERS (FIBC):*** The customer must consider the atmosphere into which the benzoic acid will be discharged. Many solvents and gases have very low minimum ignition energies (MIG), and a static discharge could cause an explosion. Inerting the atmosphere of the vessel into which benzoic acid is discharged should be strongly considered. Unloading should be controlled at a reasonable rate, and rapid emptying of the packaging should be avoided.

Emerald Kalama Chemical offers its product benzoic acid in paper bags as well as in flexible intermediate bulk containers (FIBCs). It is absolutely essential that the customer recognize the additional hazards when transferring from FIBCs, over those in the smaller volume transfers from paper bags. The build-up of static electricity during the unloading of FIBCs, and the resultant increased potential for spark, poses significant safety concerns. Various measures are available to prevent ignitions and our customers are strongly urged to familiarize themselves with FIBC unloading procedures before using such packaging.

Emerald Kalama Chemical standard FIBC for benzoic acid is a groundable bag; and it is absolutely imperative that such a bag be grounded before, during, and after unloading. An alternate antistatic CROHMIQ Blue FIBC is available, which has its own set of safety precautions. An excellent article on the safe use of FIBCs in powder handling can be found in the October 93 issue of Process Safety Progress (Vol 12, No 4).

Chilworth Technology has prepared a report interpreting dust explosion hazard data for benzoic acid powder for Emerald Kalama Chemical, which can be made available to interested customers. Our technical personnel are always ready to respond to inquiries regarding the handling of benzoic acid and the use of FIBCs.

**STORAGE:** Benzoic Acid, molten, should be stored in insulated Type 316 stainless steel tanks to avoid corrosion and product discoloration. The material is kept molten by mean of steel coils (type 316 stainless) placed inside the tank. Storage temperatures should be kept at low as possible. ~ 130 - 135° C.

The Flash Point of Benzoic Acid is essentially the same as its melting point. Storing molten benzoic acid therefore involves storage at or above its Flash Point. Appropriate precautions for that type of storage must be observed. Those considering storage of molten benzoic acid are encouraged to contact Emerald Kalama Chemical for recommendations.

**PUMPING:** Type 316 stainless steel centrifugal pumps are used. Mechanical seals of the unbalanced type are currently giving good service. Glass filled Teflon® shaft packing has been found to be satisfactory.

**PIPING:** Type 316 stainless steel pipe is recommended. In order to ensure that the material stays molten, pipelines are steam-traced, Thermonized®, and insulated. Copper tubing is normally utilized except where leaks are expected and then stainless steel tubing is used since copper is readily attacked by benzoic acid. Since benzoic acid has a rather high freeze point, 150 psig steam is used in the tracing. Care should be taken not to block both ends of a full steam traced line. Under these conditions a gasket may blow out or the pipe may rupture. So, before blocking both ends of a benzoic acid line, drain the line.

**TRANSPORTATION:** While Benzoic Acid is considered a Hazardous Substance by the EPA. the shipment of benzoic acid CHIPS it is not regulated by the DOT when shipped in a single package, in quantities of less than the EPA Reportable Quantity, which, for benzoic acid, is 5,000 #. However, shipping molten benzoic acid involves the transportation of a material within its flammable range. Therefore, when shipping molten in tank cars or trucks, benzoic acid is regulated as a FLAMMABLE LIQUID, ELEVATED TEMPERATURE MATERIAL.

**HAZARD RATINGS:**

HMIS (Hazardous Material Identification System of the National Paint and Coatings Assn.)

<b>Chips</b>		<b>Molten Liquid</b>	
HEALTH	1	HEALTH	1
FLAMMABILITY	1	FLAMMABILITY	3
REACTIVITY	0	REACTIVITY	0

*NOTE: The information presented herein is believed to be true and accurate. However, all suggestions and recommendations are made without guarantee. Our technical personnel are always ready to respond to inquiries regarding the safe handling of any of our products.*

**Emerald Kalama Chemical, LLC Sales Offices**

**Customer Service** **1-800-223-0035**  
**Kalama, WA** **1-800-233-7799** **Fax 1-360-673-3564**

**Stock Points**

Edison, NJ  
Kalama, WA

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