

LANXESS

Energizing Chemistry

1 Product Name

Bayferrox® Iron Oxide
Pigments

2 Manufacture

LANXESS
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3 Product Description

BASIC USE

Bayferrox® synthetic iron oxide pigments are one of the most popular color pigments worldwide for coloring concrete. Bayferrox is suitable for all types of concrete products, including ready-mixed and architectural concrete, concrete blocks, bricks and paving stones, concrete roofing tiles, segmental retaining wall units, architectural precast products, colored mortar cement, stucco and grout. New applications are always being developed. Consult manufacturer.

COMPOSITION & MATERIALS

The most widely used pigments for coloring concrete are synthetic iron oxides. Bayferrox pigments meet stringent color and quality specification parameters set forth by ASTM C979. To help meet these standards, the LANXESS production facilities are ISO 9000-2000 certified.

SIZES

Bayferrox pigments are available in 50 lb (23 kg) bags, bulk bags, and in custom sized packaging.

FINISHES

Final color and appearance are functions of a number of variables, including amount of pigment in the mix, water-to-cement ratio, other mix components such as aggregates and admixtures, finishing technique and curing conditions.

COLORS

At low pigment level concentrations, these pigments can turn gray concrete into a wide range of earth tone colors which show virtually no fading after many years of weather exposure. A full range of high quality color pigments, including yellows, reds, blacks and browns is produced for a variety of applications. These pigments are available in more than 24 primary colors and hundreds of blends. The shades indicated on the manufacturers color cards have been chosen for their popularity. Numerous other shades are available.

LIMITATIONS

Consult manufacturer's technical literature for recommended and excluded uses.

4 Technical Data

APPLICABLE STANDARDS

ASTM International - ASTM C979 Standard Specification for Pigments for Integrally Colored Concrete

International Organization for Standardization (ISO) - ISO 9000-2000 Quality Management and Quality Assurance Standards, Parts 1 - 3

APPROVALS

The LANXESS manufacturing plants for Bayferrox are ISO 9000-2000 series certified by the International Organization for Standardization (ISO).

ENVIRONMENTAL CONSIDERATIONS

The LANXESS manufacturing process converts scrap iron into premium iron oxides; minimal salts, no sulfur dioxide or crystalline silica is produced. Use of these products can produce nominal amounts of dust. Use appropriate protective clothing and respiratory protection. Material Safety Data Sheets (MSDS) are available upon request.

PHYSICAL/CHEMICAL PROPERTIES

These pigments are stable under exposure to sunlight and ultraviolet (UV) radiation, and are alkali Eind weather resistant.

5 Installation

PREPARATORY WORK

Handle and store product according to LANXESS recommendations. Keep materials dry and in their original packaging until ready for use. Once the specific mix design and sequencing of raw materials have been established, it should not be altered. Consistency of



Bayferrox® Iron Oxide Pigments impart color in concrete products.

raw materials in all phases of manufacturing is

the most important element in making quality colored concrete.

METHODS

Bayferrox pigments should be added to the concrete mix, not sprinkled or dusted onto the surface of the concrete. The amount of color to be used ranges from 1/2 lb (0.23 kg) up to 7 lb (3 kg) per 94 lb (43 kg) bag of cement. ASTM limits the maximum amount of color per batch to 10% of the cementitious material in the mix. For colored ready-mixed concrete, add carefully weighed aggregates, then add

1/2 to 2/3 of total batch water. Add exact amount of pigment, and mix for 1 minute. Add accurate amount of cement, approved admixtures and remaining water. Mix for a minimum of 5 minutes at high speed. Complete use recommendations for various applications are available from LANXESS.

PRECAUTIONS

Pigmentation levels greater than 10% of cementitious material content, per ASTM standard, can reduce concrete strength.

Health and safety recommendations must be observed when handling Bayferrox synthetic iron oxide pigments. Before working with any product mentioned in the Bayferrox product information, user must read and become familiar with hazards, proper use and handling recommendations. Consult LANXESS for more informa

6. Availability & Cost

AVAILABILITY

Contact LANXESS for information on product distribution and availability. LANXESS has been making many of the same standard grades of Bayferrox for several decades. These grades are available worldwide.

COST

Information on the cost for coloration can be obtained from a LANXESS representative. Concrete products manufacturers have cost information on their products.

7. Warranty

The application of these products, including any suggested formulation and recommendations, is beyond the control of LANXESS Corporation. Therefore, it is imperative that specifiers and users of Bayferrox pigments test them to ensure they meet the specific product or project requirements. All information is given without warranty or guarantee. Nothing contained in the LANXESS product information or technical recommendations is to be construed as a recommendation to use any product in conflict with patents covering any material or its use.

8. Maintenance

Other than normally expected cleaning or pressure washing of concrete surfaces by owner, concrete products integrally colored with Bayferrox iron oxide pigments require no maintenance beyond that of noncolored concrete or concrete products.

9. Technical Services

For technical assistance, contact LANXESS. A staff of trained service personnel offers design assistance and technical support.

10. Filing Systems

- First Source
- MANU-SPEC

additional technical and product information is available from LANXESS Corporation upon request

Product Information

Bayferrox® Synthetic Iron Oxide Pigments Specification Requirements for Coloring Concrete Products

Colored concrete and precast concrete products have experienced tremendous growth rates around the world. The most widely used pigments for coloring these products are synthetic iron oxides due to their outstanding price/performance ratio. At low dosages, they can turn gray concrete into a wide range of earth tone colors, which show virtually no fading even after years of exposure.

Bayferrox synthetic iron oxide pigments are made by LANXESS, and each of our manufacturing sites has ISO 9000-2000 certification. They must meet stringent color and quality specification parameters set forth by LANXESS and the American Society for the Testing of Materials (ASTM) designation C979. These specifications are closely monitored at the Bayferrox pigments production facilities in New Martinsville, West Virginia, Krefeld-Uerdingen, Germany, and in our quality assurance laboratories. A full range of high quality iron oxide pigments (yellows, reds, blacks, and browns) is produced for various applications. Bayferrox pigments meet the following requirements of ASTM Designation C979, *Standard Specification for Pigments for Integrally Colored Concrete*:

	Test	Test Method
1.	Water Wettability	ASTM 0979 7.1
2.	Alkali Resistance	ASTM C979 7.2
3.	Total Sulfates	ASTM 0979 7.3
4.	Water Solubility	ASTM 0979 7.4
5.	Atmospheric Curing Stability	ASTM 0979 7.5
6.	Light Resistance	ASTM C979 7.6
7.	Effects on Concrete	
	A. 28-days Compressive Strength	ASTM 0979 7.7.5
	B. Initial or Final Set	ASTM 0979 7.7.3
8.	Color Match of Shipment	ASTM 0979 7.8

The chart on the reverse side of this sheet lists the results of data that has been collected on the use of Bayferrox pigments in integrally colored concrete using the ASTM test methods.

Bayferrox pigments have proven to be an excellent choice for coloring concrete products such as:

Concrete blocks and bricks
Paving stones / interlocking pavers
Roof tiles
Patio slabs
Precast architectural concrete
Other precast products

Segmental retaining wall units
Grout
Colored mortar cement
Stucco
Ready-mixed concrete
Fiber cement products

Shade of Bayferrox pigments	Yellows			Reds			Blacks			Browns		
	Straight Pigment	Loading 0.5%	Loading 6.0%	Straight Pigment	Loading 0.5%	Loading 6.0%	Straight Pigment	Loading 0.5%	Loading 6.0%	Straight Pigment	Loading 0.5%	Loading 6.0%
Test												
Water-Wettability (ASTM C979 7.1)	P	N/A	N/A	P	N/A	N/A	P	N/A	N/A	P	N/A	N/A
Alkali Resistance (ASTM C979 7.2)	R	N/A	N/A	R	N/A	N/A	R	N/A	N/A	R	N/A	N/A
Total Sulfates (ASTM C979 7.3)	0.3-0.7%	N/A	N/A	0.05-0.13%	N/A	N/A	0.2-0.7%	N/A	N/A	0.3-0.7%	N/A	N/A
Water Solubility (ASTM C979 7.4)	0.15-0.35%	N/A	N/A	0.2-0.4%	N/A	N/A	0.3-0.6%	N/A	N/A	0.3-0.6%	N/A	N/A
Atmospheric Curing Stability (ASTM C979 7.5)	N/A	R	R	N/A	R	R	N/A	R	R	N/A	R	R
Light Resistance (ASTM C979 7.6)	N/A	R	R	N/A	R	R	N/A	R	R	N/A	R	R
Effect on Setting of Concrete (ASTM C979 7.7.3)	N/A	N/A	i* f* -15 +5	N/A	N/A	i* f* -25 -10	N/A	N/A	i* f* +5 +25	N/A	N/A	i* f* -25 +25
Effect on Compressive Strength (ASTM C979 7.7.5)	N/A	N/A	102%**	N/A	N/A	106.5%	N/A	N/A	106%	N/A	N/A	106.5%
Color Match of Shipment (ASTM C979 7.8)	ΔE^* <1.0	N/A	N/A	ΔE^* <1.0	N/A	N/A	ΔE^* <1.5	N/A	N/A	ΔE^* <1.5	N/A	N/A

LEGEND: P = Passed
R = Resistant
 ΔE^* = Color difference according to CIELAB (see ASTM D2244)

*deviation in minutes Standard = -60/+90
i = Initial f = final
**Control (unpigmented) = 100%
N/A – Not Applicable

Bayferrox[®] is a registered trademark of Bayer AG, Germany

The manner in which you use and the purpose to which you put and utilize our products, technical assistance and information (whether verbal, written or by way of production evaluations), including any suggested formulations and recommendations are beyond our control. Therefore, it is imperative that you test our products, technical assistance and information to determine to your own satisfaction whether they are suitable for your intended uses and applications. This application-specific analysis must at least include testing to determine suitability from a technical as well as health, safety, and environmental standpoint. Such testing has not necessarily been done by us. Unless we otherwise agree in writing, all products are sold strictly pursuant to the terms of our standard conditions of sale. All information and technical assistance is given „without warranty or guarantee and is subject to change without notice. It is expressly understood and agreed that you assume and hereby expressly release us from all liability, in tort, contract or otherwise, incurred in connection with the use of our products, technical assistance, and information. Any statement or recommendation not contained herein is unauthorized and shall not bind US. Nothing herein shall be construed as a recommendation to use any product in conflict with patents covering any material or its use. No license is implied or in fact granted under the claims of any patent.

Health and Safety Information

Appropriate literature has been assembled which provides information concerning the health and safety precautions that must be observed when handling the LANXESS products mentioned in this Publication. Before working with any of these products, you must read and become familiar with the available information on their hazards, proper use, and handling. This cannot be overemphasized. Information is available in several forms, e.g., material safety data sheets and product labels. Consult your LANXESS Corporation representative or contact LANXESS's Product Safety and Regulatory Affairs Dept., Pittsburgh, PA.

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Note: The information contained in this bulletin is current as of January 2005. Please contact LANXESS Corporation to determine if this publication has been revised.

www.US.LANXESS.com

MATERIAL SAFETY DATA SHEET

LANXESS

Energizing Chemistry

TRANSPORTATION EMERGENCY

111 RIDC Park West Drive
Pittsburgh, PA 15275-1112 USA

CALL CHEMTREC: (800) 424-9300
INTERNATIONAL: (703) 527-3887

NON-TRANSPORTATION

LANXESS Emergency Phone: (800) 410-3063
LANXESS Information Phone: (800)
LANXESS

1. Product and Company Identification

Product Name:	BA.YFERROX 918 LO
Material Number:	6294804
Chemical Family:	Inorganic Metal Oxide
Color Index Name:	Pigment Yellow 42
Color Index-No.:	77492
Chemical Name:	Hydrated Iron Oxide
Synonyms:	Iron (III) Oxide
CAS-No.:	20344-49-4
Formula:	FeOOH

2. Hazards Identification

Emergency Overview

CAUTION! Color: Yellow Form: Solid Powder Odor: Odorless.

Product poses little or no hazard if spilled. May cause mechanical irritation (abrasion). May cause respiratory tract irritation.

Potential Health Effects

Primary Routes of Entry: Inhalation, Skin Contact, Eye Contact, Ingestion

Medical Conditions Aggravated by Respiratory disorders Exposure:

HUMAN EFFECTS AND SYMPTOMS OF OVEREXPOSURE

Inhalation

Acute Inhalation

For Product: **BAYFERROX 918 LO**

Not expected to be irritating.

Acute Skin
Skin
For
Product
:
BAYFE
RROX
918 LO
Not
expecte
d to be
irritatin
g.

Eye
Acute Eye

3. Composition/Information on Ingredients

For
Product
:

4. First Aid Measures

BAYFE
RROX
918 LO
Not
expecte
d to be
irritatin
g.

Ingestion
Acute Ingestion

For
Product
:
BAYFE
RROX
918 LO
Expecte
d to be
essentia
lly non-
toxic.

Carcinogenicity:

No Carcinogenic substances as defined by IARC, NTP and/or OSHA.

Hazardous Components

This material is not hazardous under the criteria of the Federal OSHA Hazard Communication Standard 29 CFR 1910.1200.

Eye Contact

In case of contact, flush eyes with plenty of lukewarm water. Get medical attention if irritation develops.

Skin Contact

In case of skin contact, wash affected areas with soap and water.

Inhalation

If inhaled, remove to fresh air. Get medical attention if irritation develops.

Ingestion

If ingested, do not induce vomiting unless directed to do so by medical personnel. Get medical attention.

Suitable Extinguishing Media: Material is not combustible.

Use extinguishing media suitable for other combustible materials in the area.

Special Fire Fighting Procedures

Firefighters should be equipped with self-contained breathing apparatus to protect against potentially toxic and irritating fumes.

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5. Fire-Fighting Measures

6. Accidental release measures

Spill and Leak Procedures

Spills should be swept up and placed in appropriate containers for disposal. Clean up promptly by scoop or vacuum. Avoid creating dusty conditions.

7. Handling and Storage

Storage Period

Unlimited in tightly closed containers.

Handling/Storage Precautions

Handle in accordance with good industrial hygiene and safety practices. Wash thoroughly after handling. Keep container closed when not in use. Avoid breathing dust.

Further Info on Storage Conditions

Material can be stored safely at ambient temperatures.

8. Exposure Controls / Personal Protection

Country specific exposure limits have not been established or are not applicable

Industrial Hygiene/Ventilation Measures

Under normal conditions of use, special ventilation is not required.

Respiratory Protection

Although no exposure limit has been established for this product, the OSHA PEL for Particulates Not Otherwise Regulated (PNOR) of 15 mg/m³ - total dust, 5 mg/m³ - respirable fraction is recommended. In addition, the ACGIH recommends 3 mg/m³ - respirable particles and 10 mg/m³ - inhalable particles for Particles (insoluble or poorly soluble) Not Otherwise Specified (PNOS)., The following respirator is recommended if airborne concentrations exceed the appropriate standard/guideline., NIOSH approved, air-purifying particulate respirator with N-95 filters.

Eye Protection safety glasses.

9. Physical and chemical properties

Form:	solid
Appearance:	Powder
Color:	Yellow
Odor:	Odorless
pH:	4 - 8 @ 50 g/l

Melting Point:----- *Begins at 1,000 °C (1,832 °F)*
Flash Point:----- *Not Applicable*
Lower Explosion Limit: :----- *Not Established*
Upper Explosion Limit: :----- *Not Established*
Vapor Pressure:----- *Not Applicable*
Specific Gravity:----- *4 - 5 @ 20 °C (68 °F)*
Solubility in Water:----- *Insoluble*
Autoignition Temperature: ----- *Not Applicable*
Viscosity, Dynamic: ----- *Not Applicable*
Bulk Density:----- *300 - 1,000 kg/m³*

10. Stability and Reactivity

Hazardous Reactions

Hazardous polymerization does not occur.

Stability

Stable

Conditions to avoid

At temperatures greater than 356 F (180 C) the product will be converted to Fe₂O₃.

11. Toxicological Information

Toxicity Data for C.I. Pigment Yellow 42 Acute Oral

Toxicity

LD50: > 5,000 mg/kg (Rat)

Skin Irritation

rabbit, Non-irritating

Eye Irritation rabbit, Non-irritating

Carcinogenicity

Rat, Male/Female, intraperitoneal, 8 w, ambiguous

12. Ecological Information

Ecological Data for C.I. Pigment Yellow 42

Acute and Prolonged Toxicity to Fish

EC50: > 1,000 mg/l (Golden Orfe (Leuciscus idus), 48 h)

Toxicity to Microorganisms

> 10,000 mg/l, (Pseudomonas putida)

Waste Disposal Method

Waste disposal should be in accordance with existing federal, state, provincial, and/or local environmental control laws.

Empty Container Precautions

Recondition or dispose of empty container in accordance with governmental regulations

Land transport (DOT)

Nonregulated

Sea transport (IMDG)

Nonregulated

Air transport (ICAO/IATA)

Nonregulated

United States Federal Regulations

OSHA Hazcom Standard Rating: Non-Hazardous

US. Toxic Substances Control Act: Listed on the TSCA Inventory.

US. EPA CERCLA Hazardous Substances (40 CFR 302):**Components**

None

SARA Section 311/312 Hazard Categories:

Non-hazardous under Section 311/312

US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA)

SARA Title III Section 302 Extremely Hazardous Substance (40 CFR 355, Appendix A):

Components : None

US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA)

SARA Title III Section 313 Toxic Chemicals (40 CFR 372.65) - Supplier Notification

Required:

Components : None

US. EPA Resource Conservation and Recovery Act (RCRA)

Composite List of Hazardous Wastes and Appendix VIII Hazardous Constituents (40 CFR 261):

If discarded in its purchased form, this product would not be a hazardous waste either by listing or by characteristic. However, under RCRA, it is the responsibility of the product user to determine at the time of disposal, whether a material containing the product or derived from the product should be classified as a hazardous waste. (40 CFR 261.20-24)

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State Right-To-Know Information

The following chemicals are specifically listed by individual states; other product specific health and safety data in other sections of the MSDS may also be applicable for state requirements. For details on your regulatory requirements you should contact the appropriate agency in your state.

Potential exposure to the California Proposition 65 chemicals in this product have been determined to be below the No Significant Risk Level (NSRL). The concentrations reported below in units of parts per million (ppm) or parts per billion (ppb) are maximum values.

Massachusetts, New Jersey or Pennsylvania Right to Know Substance Lists:

<u>Weight %</u>	<u>Components</u>	<u>CAS-No.</u>
99 - 100%	C.I. Pigment Yellow 42	20344-49-4

<u>Weight %</u>	<u>Components</u>	<u>CAS-No.</u>
1 - 100%	C.I. Pigment Yellow 42	20344-49-4

MA Right to Know Extraordinarily Hazardous Substance List:

<u>Weight %</u>	<u>Components</u>	<u>CAS-No.</u>
25 ppm	Arsenic	7440-38-2
350 ppm	Chromium	7440-47-3
200 ppm	Nickel (Ni)	7440-02-0

California Prop. 65:

16. Other Information

NFPA 704M Rating

Health	1
Flammability	0
Reactivity	0
Other	

0=Insignificant 1=Slight 2=Moderate 3=High 4=Extreme

HMIS Rating

Health	1
Flammability	0
Reactivity	0

0=Insignificant 1=Slight 2=Moderate 3=High 4=Extreme

LANXESS Corporation's method of hazard communication is comprised of Product Labels and Material Safety Data Sheets. HMIS and NFPA ratings are provided by LANXESS Corporation as a customer service.

Contact Person: Product Safety Department
Telephone: (800) LANXESS
MSDS Number: R305494
Version Date: 08/21/2007

Report Version:

2.9

This information is furnished without warranty, express or implied. This information is believed to be accurate to the best knowledge of LANXESS Corporation. The information in this MSDS relates only to the specific material designated herein. LANXESS Corporation assumes no legal responsibility for use of or reliance upon the information in this MSDS.

Changes since the last version will be highlighted in the margin. This version replaces all previous
I versions.

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