

Material Safety Data Sheet
Flexicarb SR (stainless foil reinforced) Sheet Gasket Material
Revised November 7th, 2007

SECTION 1: PRODUCT AND COMPANY INFORMATION

Material Identification: **Flexicarb SR (stainless steel reinforced) Sheet Gasket Material**
MRG – Flexible Graphite (coated material)
Flexicarb WR (wire reinforced)

Manufacturer: Flexitallic L.P. Company Telephone No.: 281-604-2400 (USA)
6915 LaPorte Road Company Website: www.flexitallic.com
Deer Park, Texas 77536

SECTION 2: HAZARDS IDENTIFICATION

Emergency Overview:

Appearance/Odor: Dark gray; solid, sheet gasket material - graphite laminate reinforced with 316 stainless steel insert. Hydrocarbon odor.

Potential Health Effects: No hazards expected during normal industrial use as a gasket.

Possible Hazards during abnormal use or fire conditions. Although several of the ingredients used to formulate this product may be hazardous in their raw state, the manufacturing process results in a solid, infusible binding otherwise rendering the product inert. Hazardous constituents present in quantities greater than 1% (0.1% for carcinogens) may be released during abnormal use or fire conditions including overheating, torch cutting, grinding, sawing, abrading, drilling or riveting.

Under abnormal conditions of use of this product, likely routes of exposure and possible associated hazards are:

Inhalation hazards due to particulates of graphite, metals, phenolic resin, rubber and respirable dust of crystalline silica quartz. Acute exposure may result in irritation to nasal cavities and respiratory tract, breathing difficulty (dyspnea), black sputum, coughing, and wheezing. Inhalation of nickel and chromium fumes may cause metal fume fever, pneumonitis and pulmonary asthma; symptoms from metal fume exposure may not manifest until a few hours after exposure. Chronic exposures may result in decreased pulmonary function, graphite and iron pneumoconiosis (lung fibrosis, siderosis), silicosis, and pulmonary asthma. Air-borne exposures to nickel and crystalline silica quartz are listed carcinogens.

Skin and eyes: Dust may cause irritation to eyes and skin. Eye irritation may lead to redness and tearing. Prolonged skin exposure may cause dermatitis and skin sensitization. Nickel may result in allergic contact dermatitis, skin sensitization and conjunctivitis.

Ingestion: May cause severe gastrointestinal irritation accompanied with nausea, vomiting, diarrhea, and weight loss (nickel, chromium, molybdenum).

Targeted Organs: lungs, skin, eyes, and gastrointestinal tract.

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Carcinogenic: This product contains acrylonitrile, crystalline silica quartz and nickel—listed carcinogens by the IARC (International Agency for Research on Cancer) and NTP (National Toxicology Program of United States Department of Health and Human Services).

OSHA Hazardous Communication Standard (29 CFR 1910.1200 General Industry and 29 CFR 1926.59 Construction): Under normal use, this product is classified as an article and is therefore exempted from the OSHA Hazard Communication standard. However, during abnormal use such as abrasive grinding, torch cutting, sawing, drilling, etc. this product may release hazardous chemicals and should then be included in the site’s OSHA Hazard Communication Program.

SECTION 3: COMPOSITION HAZARDS IDENTIFICATION

Component	CAS #	% by Weight
Graphite	7782-42-5	16 – 95
Iron Oxide (Fe ₂ O ₃)	1309-37-1	4 - 56
Nickel	7440-02-0	0.6 - 10
Chromium	7440-47-3	1 - 15
Molybdenum	7439-98-7	0.1 - 2
Silica, Crystalline Quartz	14808-60-7	< 0.3
Rubber	None	< 1
Phenolic Resin	none	< 1
Acrylonitrile	107-13-1	< 1
Methyl Isobutyl Ketone	108-10-1	< 1
Ethyl Alcohol	64-17-5	< 1
Methyl Ethyl Ketone	78-93-3	< 1

SECTION 4: FIRST AID MEASURES

Inhalation: Move to fresh air if inhaled high concentrations of dust or vapor; monitor for delayed symptoms of metal fume exposure for several hours after exposure. Obtain medical attention. See Section 8 for exposure limits.

Eyes: Immediately flush with clean water for least 15 minutes, occasionally lifting upper and lower eyelids to remove particulates or dust; obtain medical attention.

Skin: Wash thoroughly with soap and water. If persistent irritation develops, obtain medical attention.

Ingestion: Obtain medical attention.

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SECTION 5: FIRE FIGHTING MEASURES

Suitable Extinguishing Media: Material in or near fires should be cooled with a water spray or fog. Extinguishing media may include carbon dioxide, chemical or foam.

Products of combustion: Thermal decomposition or combustion may produce dense smoke, oxides of carbon, metal fumes, and low molecular weight organic compounds whose composition has not been characterized.

Protection of Firefighters: A NIOSH-approved self-contained breathing apparatus, operating in positive pressure mode and full fire-fighting turnout gear should be worn for combating fires.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal Precautions: If a release of dust occurs during conditions of abnormal use (e.g. abrasive grinding, cutting, abrading, sawing, etc.) remove dust by collecting with a HEPA vacuum. Do not use compressed air to blow dust away from release site. Personnel in the release site should don personal protective equipment per recommendations of Section 8. Isolate the release site and prevent entry of unnecessary and unprotected personnel.

Disposal Precautions: Collected dust should be placed in airtight and sealed poly bags or containers and disposed properly in accordance to federal and state laws. Do not permit airborne releases of collected dust into the breathing zone or environment. See Section 13, "Disposal Considerations".

SECTION 7: HANDLING AND STORAGE

Handling: Avoid aggressive actions which would result in generation of dust. Such actions would include abrading, chipping, dropping, grinding, etc.

Storage: Shipping and storage may result in accumulation of dust within shipping containers and boxes. If this should occur, dispose container in airtight and sealed polyethylene bags or remove dust using a HEPA vacuum. Do not use compressed air to blow dust from the container or box. See Section 13, "Disposal Considerations". Personnel cleaning dust should don personal protective equipment per recommendations in Section 8.

General hygiene recommendation: Wash hands thoroughly after handling the product, its shipping boxes, or its collected waste or dust. Hand washing should occur before eating, smoking, and grooming.

SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

During normal use of the product, releases of product's hazardous constituents are not expected. The manufacturing process results in a solid, infusible binding that renders the product inert during its normal use. However, the product's hazardous constituents may be released during abnormal

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use or fire conditions including burning, abrasive grinding, torch cutting, sawing, abrading, drilling or riveting. Personal exposure limits to the hazardous constituents are as follows:

Personal Exposure Limits:				
Component	OSHA PEL	ACGIH [®] TLV [®]	NIOSH REL	Units
Graphite	15 mppcf	2	2.5	mg/m ³ TWA, R
Iron Oxide (Fe ₂ O ₃)	10	5	5	mg/m ³ TWA
Nickel	1.0	1.5	0.015	mg/m ³ TWA
Chromium	1.0	0.5	0.5	mg/m ³ TWA
Molybdenum	15 ----	10 3	None ----	mg/m ³ TWA mg/m ³ TWA, R
Silica, Crystalline Quartz	10 ÷ (%SiO ₂ + 2)	0.05	0.05	mg/m ³ TWA, R
Rubber	None	None	None	-----
Phenolic Resin	N.E.	N.E.	N.E.	-----
Methyl Isobutyl Ketone	100 ----	50 75	50 75	ppm TWA ppm STEL
Acrylonitrile	2 10	2 No STEL	1 10	ppm TWA, S ppm STEL
Ethyl Alcohol	1000	1000	1000	ppm TWA
Methyl Ethyl Ketone	200 ----	200 300	200 300	ppm TWA ppm STEL

OSHA: United States regulatory agency enforcing the Permissible Exposure Limits (PELs)

ACGIH: American Conference of Governmental Industrial Hygienists. Developer of the exposure guidelines—Threshold Limit Values or TLVs[®].

NIOSH: National Institute of Occupational Safety and Health of the U.S. Dept. of Health and Human Services. Developer of the exposure guidelines—Recommended Exposure Limits.

TWA = time weighted average for 8 hours of exposure for the PELs and TLVs. For the RELs, exposure time allowance is 10 hours.

mg/m³ = milligrams of contaminant per cubic meter of air.

mppcf = million particles per cubic foot of air.

R = respirable dust fraction, particulates less than 10 microns (µm) mean particle diameter.

S = skin notation, i.e. danger of absorption of chemical through skin.

N.E. = Not Established.

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Engineering Controls: No specific engineering controls are needed during normal product use and handling.

Personal Protective Equipment (PPE): No PPE required during normal product use and handling.

During abnormal use such as abrasive grinding, torch cutting, machining, abrading, etc. the following protective measures should be employed.

Engineering Controls during abnormal operations:

- Operations producing dust should be provided with exhaust ventilation equipped with a HEPA filter for removing dust containing hazardous constituents from breathing zone.

PPE during abnormal operations:

- *Respiratory protection.* If exposure to the above hazardous constituents is expected to be equal or greater than 50% of their exposure limits or if exposure concentrations are unknown, don a NIOSH-approved air-purifying respirator fitted with N95 or P95 particulate filters (i.e. approved as having 95% filter efficiency).
- *Eye protection.* Wear safety glasses during the above abnormal operations. For abrasive grinding, wear safety glasses and a face shield. Safety eyewear should meet requirements of ANSI Z87.1-2003, “American National Standard Practice for Occupational and Educational Personal Eye Protective Devices”.
- *Skin and hair protection against dust exposures.* For dust generating activities, wear disposable and dry particulate, impermeable coveralls such as Tyvek[®] or equivalent.

Firefighting: For combating fires don a NIOSH-approved self-contained breathing apparatus, operating in positive pressure mode and full fire-fighting turnout gear. For additional fire fighting measures, see Section 5.

General Hygiene Considerations: Wash hands thoroughly after handling the product and before eating, smoking, and grooming. Hand washing is recognized as a good industrial hygiene practice when handling products containing hazardous constituents.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Color: Dark Gray	Odor: Hydrocarbon
Odor threshold: Not applicable	Physical state: Solid sheet material
pH: Not applicable	Freezing point: Not applicable
Boiling point: Not applicable	Flash point: Not applicable
Evaporation rate: Not applicable	
Flammability: Not applicable; product is inherently flame resistant	
Upper flammability Limit: Not applicable	Lower Flammability Limit: Not applicable
Vapor pressure and density: Not applicable	Specific gravity: 1.0 – 1.5

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Chromium Metal (Cr, 1 - 15%):

Inhalation hazards: Acute exposure may result in cough and irritation of respiratory system. Prolonged exposure may cause histologic fibrosis of the lungs. Immediately Dangerous to Life and Health (IDLH) at air-borne concentration of 250 mg/m³.

Skin and eye contact: Repeated or prolonged exposure may cause skin and eye irritation and sensitization.

Ingestion: Poisonous by ingestion; may cause severe gastrointestinal irritation.

Nickel Metal (Ni, 0.6 - 10%):

Inhalation hazards: Repeated or acute inhalation of nickel metal fumes may cause pneumonitis and/or pulmonary asthma. Symptoms often do not manifest until a few hours after exposure; symptoms are aggravated by physical effort. Anyone showing symptoms of asthma due to nickel exposure should avoid further exposure to this substance. Nickel dusts and fumes may cause mechanical irritation to nasal cavities. Nickel is listed by the IARC (International Agency for Research on Cancer) as a Group 2B carcinogen—possibly carcinogenic to humans and by the NTP (National Toxicology Program) as *reasonably anticipated to be human carcinogen*. Immediately Dangerous to Life and Health (IDLH) at air-borne concentration of 10 mg/m³.

Skin and Eyes: Contact exposure may cause allergic contact dermatitis, conjunctivitis, and inflammatory reactions around nickel-containing medical implants and prostheses. *Ingestion:* Causes gastrointestinal irritation with nausea, vomiting and diarrhea.

Molybdenum (Mo, 0.1 - 2%):

Inhalation hazards: Dust may cause irritation of nasal and respiratory passages. Immediately Dangerous to Life and Health (IDLH) at air-borne concentration of 5000 mg/m³.

Skin and eye: Irritant to eyes and skin.

Ingestion: May cause diarrhea, loss of weight and damage to liver and kidney.

Silica, Crystalline Quartz (SiO₂, < 0.3%):

Inhalation hazards: Acute exposure to silica dust may cause paroxysmal coughing, dyspnea (breathing difficulty), and wheezing. Chronic exposure may result in decreased pulmonary function and silicosis—a progressive respiratory illness involving lung fibrosis. Crystalline silica quartz is listed by the IARC (International Agency for Research on Cancer) as a Group 1 carcinogen—carcinogenic to humans and by the NTP (National Toxicology Program) as *known human carcinogen*. Immediately Dangerous to Life and Health (IDLH) at air-borne concentration of 50 mg/m³. *Eyes:* Mechanical irritation to the eyes.

Rubber (Powdered, < 1%)

Inhalation: May cause mild irritation of respiratory tract. Repeated and prolonged inhalation of dust may lead to benign pneumoconiosis. This condition may cause some lung function impairment but is reversible with reduced exposure.

Eyes: May cause mild eye irritation.

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Phenolic Resin (< 1%)

Inhalation hazards. Dust may cause irritation to nasal and respiratory tract. If formaldehyde vapors are present, inhalation may cause a form of nasal cancer. *Eyes and skin:* May cause irritation, redness, and tearing of the eyes. Prolonged dust exposure to the skin may cause dermatitis and skin sensitization.

Acrylonitrile (< 1%):

Inhalation hazards: Acute exposure to acrylonitrile vapors causes irritation to the respiratory tract, dizziness (general anesthesia), headache, nausea, vomiting, and weakness. Higher doses result in chest tightness, salivation, and convulsions (central nervous system affects). Repeated long-term exposure may have effects on the central nervous system and liver. Dust may cause irritation of nasal and respiratory passages. Acrylonitrile is listed by the IARC (International Agency for Research on Cancer) as a Group 2B carcinogen—possibly carcinogenic to humans and by the NTP (National Toxicology Program) as *reasonably anticipated to be human carcinogen*. Immediately Dangerous to Life and Health (IDLH) at air-borne concentration of 85 ppm.

Skin and eye: Acrylonitrile may be absorbed through the skin, resulting in systemic exposure. Irritant to eyes and skin. Redness, pain, scaling dermatitis, and blisters to the skin. Redness and pain to the eyes.

Ingestion: Abdominal pain and vomiting.

Methyl Isobutyl Ketone (Hexone, < 1%)

Inhalation hazards. Acute exposure causes irritation to the respiratory tract, mucous membranes, sore throat, weakness, nausea, and headaches. Higher doses lead to vomiting, narcosis and unconsciousness. Repeated and prolonged exposure may cause liver and kidney damage. *Eyes and skin:* Irritates skin, eyes and mucous membranes. *Ingestion:* Toxic by ingestion. This substance may be systemically absorbed into the body by inhalation and ingestion.

Methyl Ethyl Ketone (M.E.K., < 1%)

Inhalation hazards. Acute exposure irritates the nose and respiratory tract and causes coughing, dizziness, drowsiness, headache, nausea, and vomiting. Higher doses affect the central nervous system causing symptoms of dizziness, drowsiness, and then unconsciousness. *Eyes and skin:* Irritates eyes and skin. *Ingestion:* Toxic by ingestion. This substance may be systemically absorbed into the body by inhalation and ingestion.

Ethyl Alcohol (a.k.a. ethanol, < 1%)

Inhalation hazards: May cause irritation to the nasal and respiratory tract and coughing. Acute exposure to ethyl alcohol will lead to headaches, fatigue, lack of concentration, drowsiness and central nervous system effects. Prolonged and repeated exposure may affect the liver, blood and reproductive system. *Eyes and skin:* Irritates the eyes and skin; causes redness and burning in the eyes and dryness on the skin. *Ingestion:* Toxic by ingestion causing burning sensation, headache, confusion, dizziness, unconsciousness; ethanol consumption during pregnancy may adversely affect the unborn child. Chronic ingestion may cause liver cirrhosis.

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Aggravation of Pre-existing Health Conditions. Persons with pre-existing respiratory or cardiopulmonary problems may be more susceptible to the effects of exposure to the above hazardous substances.

SECTION 12: ECOLOGICAL INFORMATION

No ecological test data has been developed. Impact to aquatic, terrestrial and air environmental media is judged as insignificant.

SECTION 13: DISPOSAL CONSIDERATIONS

Dispose of solid waste in accordance with federal, state and local regulations. Waste should be placed in airtight containers and properly disposed. Contact local regulatory agency for guidance.

SECTION 14: TRANSPORT INFORMATION

Not regulated as a hazardous material by DOT (United States Department of Transportation) or IMO.

Ship in sealed boxes appropriately rated for weight capacity.

SECTION 15: REGULATORY INFORMATION

OSHA:

Product is considered to be an article under normal conditions and use. During conditions of abnormal use (e.g. abrasive grinding, machining, sawing, torch cutting, etc.) the following OSHA Standards may apply: 29 Code of Federal Regulations (CFR) 1910.1200, *Hazard Communication*, 1910.1000, Tables Z-1 and Z-3, *Air Contaminants*, 1910.134, *Respiratory Protection*, 1910.132, *General Requirements*, and 1910.1020, *Access to Employee Exposure and Medical Records*.

SARA Title III:

Sections 302, 311 and 312: This product contains acrylonitrile which is listed as an "extremely hazardous substances" per SARA Sections 302/312. Reporting requirements for acrylonitrile apply when exceeding the reportable quantity (RQ) of 100 lbs.

Section 313: This product contains acrylonitrile, chromium, methyl isobutyl ketone, methyl ethyl ketone, and nickel which are listed chemicals per 40 CFR Part 372.65. Chemicals are to be reported when facility consumption exceeds the Section 313 threshold reporting quantity.

CERCLA: This product contains acrylonitrile, chromium, methyl isobutyl ketone, methyl ethyl ketone, and nickel. These substances are listed CERCLA substances when used in excess of reportable quantities (RQ) per 40 CFR 302.

CAA: Product contains the listed chemical acrylonitrile; threshold quantity (TQ) for CAA accident prevention regulations is 20,000 lbs.

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TSCA: Not applicable

SECTION 16: OTHER INFORMATION

National Paint and Coating Association's (NPCA) HMIS[®] III (Hazardous Materials Identification System, Third Version) Label Ratings:

Ratings based on normal use: HEALTH 0, FLAMMABILITY 0, PHYSICAL HAZARDS 0, PPE: None Required.

Ratings based on abrasive grinding, machining and other abnormal uses: HEALTH *3, FLAMMABILITY 0, PHYSICAL HAZARDS 0, PPE rating to be supplied by user depending on specific operations and safety engineering controls available.

NOTE: HMIS[®] ratings involve data review and interpretation that may vary among operations. The HMIS[®] ratings are intended only for rapid, general identification of the magnitude of potential hazards. The ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. An asterisk (*) in the HMIS[®] health field, designates potential chronic health hazards such as cancer, reproductive effects, or chronic injury to a specific organ of the body. Further explanation and definitions HMIS[®] ratings of available at <http://www.paint.org/hmis/index.cfm>

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This MSDS is intended to comply with the format of ANSI Z400.1-2004, *American National Standard for Hazardous Industrial Chemicals—Material Safety Data Sheets—Preparation* and the United States' Occupational Safety and the Hazard Communication Standard (29 CFR 1910.1200 General Industry and 29 CFR 1926.59) enforced through OSHA (Occupational Safety and Health Administration) of the U.S. Department of Labor.
