Global Ratio Co.

MATERIAL SAFETY DATA SHEET

SECTION I - Chemical Product and Company Identification

Product code	Trade Name	Chemical formula	Molecular Weight
Not Applicable	**Carbon Black**	**C**	**12**

Manufacturer / Supplier	Address
Global Ratio Co.	**Rasim Paşa Mahallesi Taş Köprü Caddesi Ayrılık Çeşmesi Sokak No : 142 Kadıköy İSTANBUL**

Telephone no.	Fax No.	Emergency Telephone No.
+90 507 610 53 23		**See Section XVI**

SECTION II - Composition / Information on Igredients

Substance Trivial Name	Formal Name	Chemical Family
Carbon Black	**Carbon Black**	**Carbon**

Trade Name and Synonyms

(no trade name)

N-220 ,N-330, N-339 , N-375 , N-550 , N-660 Product names according to ASTM

Material uses

Used as a filler , reinforcing agent , pigment , electrical conducting or chemical reducing agent , in rubbers , inks , copy machine toners , paints .

SECTION III - Hazards Identification

Main Hazards

Combustible - fire may not be visible in powder ; releases carbon monoxide and carbon dioxide when burning ; not easily extinguished when burning ; water may spread a fire by floating ignited dust . Some carbon black grades are electrically conductive . Dust is fine enough to penetrate electrical boxes , unless boxes are tightly sealed . Dust and powder may cause electric shorts .

Potential Health Effects

Inhalation - May be irritating to the lungs at high dust levels. Ingestion - No known specific effects. Eyes - Carbon black dust may irritation of the eye. Skin - Skin contact not irritating.

Carcinogenicity- The international Association for the Research in Cancer clasified carbon black as Group 2B.Not listed as a carcinogen by IARC.

SECTION IV - First Aid Measures

Inhalation -Not hazardous.In case of discomfort , Remove to fresh air. **Ingestion** - Non hazardous.Not treatment recommended for ingestion. **Eyes** -in case of irritation, Flush lightly with water to remove dust.

Skin - Wash with water and mild soap or waterless cleaner.

Most skin irritation attributed to carbon black is due to soap and scrubbing used during washup.use a mild unscented soap and a soft cloth or towel to apply soap repeatedly to skin.

SECTION V - Fire Fighting Measures

Flash point : Not applicable. Extinguishing Media : water spray . Normal fog or nozzle jet application and/or exclusion of air.

Unusual fire hazards : carbon monoxide and carbon dioxide are emitted when burning.

It may not be obvious that carbon black is burning unless it is stirred and sparks are apparent.

Lower Explosive limit See note below .	**Ignition in air** May occur above 315 °C (600 °F)
Upper Explosive limit Not applicable.	**Flame Propagation in air** Very slow burning solid .
Flammability Classification Combustible solid .	**Combustion Hazards** Carbon monoxide (CO) and carbon dioxiae (CO2) .

Protective Equipment

Use appropriate respirator for CO and CO2 .

Sensitivity to Impact

Not applicable

Static Discharge Effects

Some grades of carbon black are electrically non - conducting enough to allow a build up of static electrical charge during handling .

Dust Explosion Potential

NOTE : European Committee for Biological Effects'of Carbon Black （ February 1984) . Explosion and 'Ignition Behaviour of Carbon Black with Air .

Carbon black cannot easily be caused to explode and therefore it is not considered a danger in practical use . However , in special test procedures a carbon black / air mixture can be explode . The following data were found :

1- Lower Limit for Explosion (carbon black in air)	50 g/m3
2- Maximum Explosion Pressure	10 bar
3- Maximum Rate of Pressure Rise	30 - 100 bar/sec
4- Minimum Ignition Temprature	315 °C
5- Ignition Energy	Over 1 KJ
6- Glow Temperature	Approx. 500 °C

Notes on Test Methods:

(a) Tests 1 , 2 and 3 were carried out by Bergwerkschaftliche - versuchsstrecke , Dortmund Deme , using a 1 m3 vessel with two chemical igniters having an intensity of 5000 W.S.

(b) Test 1 and 2 results are confirmed by information in Handbook of powder technology , Vol.4 (P.Field)

(c) In test 4 modified Godbert - Greenwald furnace was used. See U.S.Bureau of Mines , Report 5624 , 1960 , p.5 "Lab Equipment and Test Procedures" .

(d) Test 5 used a 1m3 vessel with chemical igniters of variable intensity .

(e) Test 6 was conducted in a laboratory oven . Active glowing appeared after 3 min . exposure .

Personal Precautions

Wear protective equipment appropriate for dust levels anticipated - see Section VIII .

Spill Cleanup Measures

spilled carbon black is not a hazardous waste.Spills should be removed by vacuuming , or by lightly spraying with water and sweeping mixture into a suitable container in order to prevent dust.To avoid dust generation , do not sweep dry.

Environmental Precautions

Carbon black is not a hazardous waste . Dispose of in landfill or by incineration in accordance with national and 'local laws and ' regulations .

SECTION VII - Handling And Storage

Handling & Storage Precautions

Prevent exposure to tempratures above 300 °C , open flames and strong oxidizers . Carbon black will absorb moisture and vapors from air . Keep container tightly sealed to prevent dust and moisture/vapor absorption . Store in clean dry area .

Hygenic Practices

Avoid creating dust . Clean up all spills promptly . Avoid skin contact . Wash exposed skin daily . Wash work clothes daily .
Application of barrier cream prior to exposure may assist removal from skin.

Special precautions

Before entering closed vessels and confinded spaces containing carbon black test for possible elevated levels of CO and CO2 , or lack of adequate oxigen .

SECTION VIII - Exposure Controls / Personal Protection

Definitions

ACGIH	MAK	OEL
American Conference of Governmental Industrial Hygienists .	Maximale Arbeitsplatz Konzentration	Occupational Exposure Limit

TLV		TWA
Threshold Limit Value		Time Weighted Average Concentration

Inhalation Standard

ACGIH TLV = 3.5 mg/m3 TWA total dust GERMANY : MAK =6 mg/m3 TWA fine dust (general dust limit) UNITED KINGDOM : OEL = 3.5 mg/m3 total dust

Eye - Face Protection

None Required

Eye protection recommended if dust levels exeed OEL in order to prevent eye irritation .use safety glasses with side shields.

Gloves None Required Barrier cream applicatio prior to exposure may assist in the removal of carbon black from the skin .

Protective Clothing None Required

Work clothing should be confined to the workplace and washed daily in order to prevent spreading unsightly black dust .

Respiratory Protection

If carbon black dust concentration is above the recommended occupational exposure limit , appropriate dust masks should be worn in accordance with European , National and local laws and regulations .

Engineering Controls

Recommend adequate ventilation to maintain exposure levels below the recommended exposure limit.for ventilation considerations,use guidelines recommended by the ACGIH.

Other Protective Measures

Wash exposed skin daily . Wash exposed clothing daily .

SECTION IX - Phisical and Chemical properties

Phisical state	Color	Odor
Solid Powder	Black	None

Bulk Density	PH	Boiling Point
100 - 550 kg/m3	7 (min)	Not applicable
Evaporation Rate	**Melting/Freezing Point**	**% Volatile By Volume**
Not applicable	Not applicable	Not applicable
Solubility In Water	**Specific Gravity**	**Vapor Density**
Insoluble	(Water = 1) 1.7 - 1.9	Not applicable
Vapor Pressure	**Reid Vapor Pressure**	**Water / Oil Distribution**
Not applicable	Not applicable	Not applicable

Viscosity	Pour Point
Not applicable	Not applicable

SECTION X - Stability and Reactivity

Chemical Stability	Hazardous Polymerization	Incompatible Mateials
Stable	will not occur.	Strong Oxidizers

Conditions To Avoid

Contact with strong oxidizers ;exceeding ignition temperature of 315 °C (600°F) ; excessive heat or flame .

Hazardous Decomposition

monoxide (CO) and carbon dioxide (CO2) when burning .

Reactivity

May react exothermically uponcontact with strong oxidizers ,i.e. , chlorates ,bromates nitrates .

SECTION XI - Toxicological Information

Routes of Exposure

Inhalation , Ingestion , Eyes , Skin contact (not absorbed through the skin)

Acute Inhlation Effct

Dust concentrations above the permissible exposure limit may cause temporary upper respiratory tract discomfort.

Acute Eye Effect	Acute Ingestion Effect	Acute Skin Effect
Mild irritant	None expected	None expected

Chronic:

Human studies : Epidemiologic studies of workers in the carbon black producing industries of North American and Western Europe show no significant adverse health effects due to occupational exposure to carbon black . Early studies in the former USSR and Eastem Europe report respiratory diseases among workers exposed to carbon black , including ; bronchitis ,pneumonia , emphysema and rhinitis . Such studies are of questionable validity , due to inadequate study design and methodology , lack of appropriate controls for cigarette smoking and other confunding factors , such as concurrent exposures to carbon black monoxide , coal oil and petroleum vapors . Moreover , review of these studies indicates that concentrations of carbon black were greater than current occupational exposure standards. There is inadequate evidence for the carcinogenicity in humans of carbon b l ack. Animal Toxicity studies : Carbon black contains less than 0.1% of adsorbed PAHs (Polynuclear Aromatic Hydrocarbons) . In non-adsorbed from ,some PAHs have been found to be carcinogens in animal studies. No correlating carcinogenic effect, however, has been found in humans due to exposure to carbon black . Chronic inflammation , lung fibrosis and lung tumors have been observed in some rats experimentally exposed , for long periods of time ,to very high concentrations of carbon black and several other insoluble fine dust particles. Tumors have not been observed in other animal species(I.e.mouse and hamster) under similar circumstance and study conditions.

Chronic Ingestion Effect	**Chronic Eye Effect**	**Chronic Skin Effect**
None expected	Mild irritant	None expected
Sensitization to Material	**Teratogenicity**	**Synergistic Materials**
None expected	None Known	None expected

Reproductive Toxicity

None Known

Medical Eye effect

Aggravated : None expected .Carbon black, like any nuisance dust, may aggravate certain pre-existing upper respiratory disorders, such as bronchitis or asthma .

Carcin o g en icit y

Not listed as a carcinogen by the following : IARC (International Agency for Research on Cancer) - listed by IARC as aGroup 3 substance - that is , a substance for which information is inadequate to permit a determination that it iscarcinogenic to either humans or animals ; NTP (U.S. National Toxicology Program) ; OSHA, NIOSH Criteria Documentrecommends that carbon black with PAH (Polynuclear Aromatic Hydrocarbon) levels greater than 0.1% be consideredsuspect ccontain less than 0.1% PAHs . arcinogens . DSP Corporation carbon black

LD (50%) for Material	**LC (50%)for Material**
>240 mg/kg , IP injection, mice and rats	>156 mg/kg , mice and rate

SECTION XII - Ecological Information

Mobility	**Persistance / Degradability**	**Bio-Accumulation**
Not mobile in soil . Not soluble in water .	Does not biodegrade .	Not expected to accumulate in biological organisms .

Eco t o xicit y

Not toxic to aquatic or terresttial plants or animals .

SECTION XIII - Disposal Considerations

Carbon black is not classified as a toxic or dangerous waste under council Directive 78/319/EEC and its amenments.

Bury or burn in accordance with all applicable regulations. Any disposal practice must be in compliance with European,national and local laws and regulations.

SECTION XIV - Transport Information

UN Number	**UN Proper Shipping Name**	**UN Packing Group**
Not classified	Carbon Black	Not classified

UN Class

Combustible solid . The United Nations Transport of dangerous Goods Regulations do not classify carbon black as spontaneously flammble

IMDG Proper Shipping Name

The IMDG (International Maritime Dangerous Goods) Code does not classify carbon black as a "hazardous cargo "if it is" carbon, nan-activated,mineral origin. "Global Ratio carbon black meet this definition. Carbon blacks are not subject to the IMDG Code provisions for hazard class 4.2 if they pass the test for non -activated carbon blacks described on page 4082-1 Global Ratio carbon black pass this IMDG test .

US Rail Regulations

Non-hazardous material . The Bureau of Explosives of theAssociation of American Railroads has ruled it is unnecessary to classify carbon black as hazardous under U.S.DOT (Department of Transportation) regulations .

SECTION XV - Regulatory Information

National Registries - Carbon black , CAS number 1333-86-4 , appears on :

Australia : AICS , Australian Inventory of Chemical Substances .

Canada : CEPA , Canadian Environmental Protection Act , 6th Amendment ,Domestic Substances List .

Europe : EINECS , European Inventory of Existing Commercial Chemical Substances . Includes Belgium , Denmark , France , Germany , United Kingdom . Austria , Greece , Ireland , Italy , Luxembourg , Netherlands , Portugal , Spain and Finland , Norway , Sweden and Switzerland also have chemical control laws which generally folow EINCES .

Japan : MITI , Ministry of Intermation Trade and Industry List of Existing chemical Substances .

Korea : TCCL , Toxic Chemicals Control Law .

United States : TSCA , Toxic Substances Control Act . Carbon Black is a Chemical Hazard Information Profile (CHIP) chemical under TSCA .

SECTION XV - Continued

79/83/EEC Classification , packaging and labelling of dangerous substances and its amendments do not classiffycarbon black as a dangerous sabstance .

German VDI guideline 2263 Part 1 . Test methods for the determination of safety characteristics of dusts .

International Agency for Research on Cancer (IARC) lists carbon black as group 3 and carbon black extracts as group 2B .

Germany : Technische fur Regal Gefahrstoffe TRGS 900-Occupational Exposure Limit (Maximale Arbeitsplatzkonzentrati on-MAK) for fine dust 6 mg/m3 (general dust limit) .

Germany : VDI guldeline 2580 , Emission Control-Production for Carbon Black - Classification of Carbon Black in water hazard class 0 . (Carbon Black is classified as not water hazardous material) .

United Kingdom , Health and Safety Executive Guidance Note EH40/92 sets the exposure limit for Carbon Black at 3.5 mg/m3

78/319/EEC Council Directive on toxic and dangerous waste and its amendments Carbon black is not considered toxic or dangerous under 78/319/EEC and its amendments .

FOR MATERIALS IN CONTACT WITH FOOD

Europe : Council of Europe , Resolution AP/89/1 published in 1989 .

Germany : Der 9 Empfehlung des Bundes-Gesundheit Minnisterinm # B1.31.363 von 1988 .The 9th recommendation of Federal Health Ministry number. B1.31.363 published in 1988

France : Circulaire No. 176 du 2.12.59 publiee au Journal Officiel du 30.12.59 .

Italy : Dectreto Ministeriale n.220 of 26 April , 1993

SECTION XVI - Other Information

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