

SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION	
Product Name	TENAC™-C CF452, CF453, CF454, EA451, G455S, G455X, G457S, G457X, GN455, GN752, GN755, LC750, LD755, LV450, LX750, LZ750, MT754, RD450, RD451, RD750, RD751, RD752, SA471, SA472, SA474, SA478, SG452, SG454, ZLD75, ZLV40, NS556, WS350
SDS No.	TC-W002-13
Company Name	ASAHI KASEI CORPORATION
Address	1-105 Kanda Jinbo-cho, Chiyoda-ku, Tokyo 101-8101 Japan
Contact Department and Telephone Number	
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ASAHI KASEI PLASTICS (GUANGZHOU) CO., LTD. Phone +86-20-8527-1616, Fax +86-20-8527-1700	
Contact Department and Telephone Number	
USA	CHEMTREC United States : (800)424-9300 24 hours Everyday International : +1-703-527-3887(Collect) 24 hours Everyday
EU	BIG v.z.w. Phone +32-1-458-4545, Fax +32-1-458-3516 Technishe Schoolstraat 43A B-2440 Geel, Belgium
Others	Tenac Technical Dept. Phone +81-44-271-2448, Fax +81-44-271-2168 9am-6pm(Japan time) on weekday
Recommended use and restriction on use, destination	
Recommended use	Plastic ingredient for home electronics, electronic materials, automotive materials, industrial materials.

SAFETY DATA SHEET

Restriction on use	Please do not use our product TENAC-C for the following use. -Medical container/ packaging/ equipment/ parts of in-vino, or which contact with mucosa, body fluid, blood, and chemical solution. -Equipment and parts which contact with food containers/ packaging/ equipment/ parts and drinking water. -Toys which contacts with mouth, drinking water and etc.
Notes about the destination	In the case of export to USA, some products described in this SDS are need to apply the polymer exemption. The products of some color numbers might contain the pigments and dyes not registered as an existing chemical substance of some countries except USA, EU and Japan. If you will export this product to other countries, check with us beforehand because this material may not be eligible to be exported to such countries which have regulations upon chemicals, unless otherwise we note the eligibility on this SDS. We cannot take any responsibilities if we are not given any notice beforehand.

2. HAZARDS IDENTIFICATION

[GHS Classification]

Health Hazards	Can not be classified
Environmental Hazards	Can not be classified

[GHS label element]

Pictogram or symbol	Non
Signal word	Non
Hazard statement	Non
Special Hazard	Polyoxymethylene (polyacetal) resin needs attention so that heating (drying, fusion) and the gas that the formaldehyde is harmful to combustion time (in particular, incomplete combustion time) are generated.

[Precautionary statements]

Safety measures	Do not handle until all safety precautions have been read, understood and precautionary measures are taken. Do not eat, drink or smoke when using these products. Wear protective gloves, eye-protection if necessary. Take burn prevention measures especially when handling melted resin. Install effective local exhaust in extrusion press because gas is generated.
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SAFETY DATA SHEET

3. COMPOSITION / INFORMATION ON INGREDIENTS

Chemical name or generic name Polyoxymethylene (Polyacetal) resin composition.
POM copolymer

Components, Contents, Chemical formula, CAS number and EINECS number

Components	Contents [wt%] Total 100wt%	Chemical formula	CAS No.	EINECS No.
CF452, CF453, CF454				
POM copolymer	75-95	$[-CH_2O-]_n$	24969-26-4	N/A
Carbon fiber	5-25	C	7440-44-0	231-153-3
Others(*1)	< 5	confidential	Registered	Registered
EA451				
POM copolymer	90-97	$[-CH_2O-]_n$	24969-26-4	N/A
Antistatic agent	1-5	confidential	Registered	N/A
Others(*1)	< 5	confidential	Registered	Registered
GN455, GN752, GN755				
POM copolymer	65-95	$[-CH_2O-]_n$	24969-26-4	N/A
Glass fiber	5-30	complex of oxides	65997-17-3	266-046-0
Others(*1)	< 5	confidential	Registered	Registered
G455S, G457S, G455X, G457X				
POM copolymer and POM specialty copolymer	60-80	$[-CH_2O-]_n$ and confidential	24969-26-4 and Registered	N/A
Glass fiber	20-40	complex of oxides	65997-17-3	266-046-0
Others(*1)	< 5	confidential	Registered	Registered
LC750, LV450, LZ750, ZLV40				
POM copolymer	90-99	$[-CH_2O-]_n$	24969-26-4	N/A
Silicone lubricants	1-5	confidential	Registered	Registered
Others(*1)	< 5	confidential	Registered	Registered
LD755, ZLD75				
POM copolymer	65-80	$[-CH_2O-]_n$	24969-26-4	N/A
Inorganic filler	20-30	confidential	Registered	Registered
lubricants	secret	confidential	Registered	Registered
Crystalline silica(*2)	< 0.3	SiO ₂	14808-60-7	238-878-4
Others(*1)	< 5	confidential	Registered	Registered
LX750				
POM copolymer	90-99	$[-CH_2O-]_n$	24969-26-4	N/A
lubricants	secret	confidential	Registered	Registered
Others(*1)	< 5	confidential	Registered	Registered
MT754				
POM copolymer	65-80	$[-CH_2O-]_n$	24969-26-4	N/A
Inorganic filler	20-30	confidential	Registered	Registered
Others(*1)	< 5	confidential	Registered	Registered
RD450, RD451, RD750, RD751, RD752				

SAFETY DATA SHEET

POM copolymer	90-99	$[-CH_2O-]_n$	24969-26-4	N/A
lubricants	1-5	confidential	Registered	Registered
Others(*1)	< 5	confidential	Registered	Registered
SA471,SA472				
POM copolymer and POM specialty copolymer	35-60	$[-CH_2O-]_n$ and confidential	24969-26-4 and Registered	N/A
Elastomer	40-65	confidential	Registered	N/A
Others(*1)	< 5	confidential	Registered	Registered
SA474,SA478				
POM copolymer and POM specialty copolymer	60-90	$[-CH_2O-]_n$ and confidential	24969-26-4 and Registered	N/A
Elastomer	10-40	confidential	Registered	N/A
Others(*1)	< 5	confidential	Registered	Registered
SG452,SG454				
POM copolymer and POM specialty copolymer	35-60	$[-CH_2O-]_n$ and confidential	24969-26-4 and Registered	N/A
Elastomer	secret	confidential	Registered	N/A
Silicone lubricants	secret	confidential	Registered	Registered
Others(*1)	< 5	confidential	Registered	Registered
NS556				
POM copolymer	48-90	$[-CH_2O-]_n$	24969-26-4	N/A
Inorganic filler	10-50	confidential	Registered	Registered
Others(*1)	< 5	confidential	Registered	Registered
WS350				
POM copolymer	90-97	$[-CH_2O-]_n$	24969-26-4	N/A
Softening agents	secret	confidential	Registered	Registered
Others(*1)	< 5	confidential	Registered	Registered

*1. Others might contain heat stabilizers, light stabilizers, Antioxidants, weather-resistant agents, softening agent, dispersing agent, lubricants, pigments and dyes.

*2. LD755 and ZLD75 contain Crystalline silica (CAS No. 14808-60-7) as impurities of Inorganic filler.

These products might contain 2wt% of Carbon black (CAS No. 1333-86-4), 5wt% of Titanium dioxide (CAS No. 13463-67-7) and 2wt% of Di iron trioxide (CAS No. 1309-37-1) as the pigments each other.

The polymer exemption (USA)

The importers who import the following products to USA have to apply the polymer exemption to the Environmental Protection Agency.

G455S, G457S, G455X, G457X, SA471, SA472, SA474, SA478, SG452, SG454

Exemption materials from examination of toxicity (Korea)

SAFETY DATA SHEET

The following products contain new chemicals, which are exempt materials from examination of toxicity of Korea. Please contact to TENAC Sales & Marketing Dept. about these details.

G455S, G457S, G455X, G457X, LC750, LV450, LZ750, ZLV40, SA471, SA472, SA474, SA478, SG452, SG454

Uncolored products

All of ingredients are listed on EINECS /ELINCS(EU), ENCS (JPN), ISHL (JPN), and IECSC (CHN) inventories.

All of ingredients are listed on TSCA inventories except G455S, G457S, G455X, G457X, SA471, SA472, SA474, SA478, SG452 and SG454.

All of ingredients are listed on ECL(KOR) inventories except G455S, G457S, G455X, G457X, LC750, LV450, LZ750, SA471, SA472, SA474, SA478, SG452, SG454 and ZLV40.

Colored products

The products of some color numbers might contain the pigments and dyes not registered as an existing chemical substance of some countries except USA, EU and Japan.

These ingredients are corresponding to the REACH regulations.

These products do not contain Substances of Very High Concern(SVHC) concentration above 0.1wt%

4. FIRST AID MEASURES

Swallowed.	If the pellet was swallowed accidentally, vomit immediately and get medical attention/advice if any abnormality occurs.
Eyes.	If pellet got in eyes. Do not rub. And wash with plenty of water. Remove contact lenses immediately. If abnormality is observed get medical attention and advice.
Skin.	If melted resin was contacted with skin. Do not peel off melted material. And cool down affected area with plenty of water for more than 30 minutes. Then get medical attention.
Inhaled	If inhaled the gases generated from melted material. If you feel unwell, move away from the working place immediately to well-ventilated area. Get medical advice if necessary.
Protection who gives the first aid.	Those who suffer from any abnormality should get medical attention.

5. FIRE-FIGHTING MEASURES

Extinguisher	Pouring water, spraying water, carbon dioxide (CO ₂), dry chemical extinguishing system and other extinguisher can be used.
Specific hazards	Strong heat, and gases such as Formaldehyde, CO ₂ , CO may be generated on fire.
Specific fire fighting method	Use the same fire fighting method as the general fire. Fight fire from the safe distance. Work from the windward.
Protection of fire fighter	Wear fire retardant clothing and respiratory equipment when fighting fire.

6. ACCIDENTAL RELEASE MEASURES

SAFETY DATA SHEET

Personal precautions, protective equipment and emergency procedures	Clean up the floor immediately because it may be slippery if pellet or powder remains.
Environmental precautions	Collect all leakage on the water surface such as drain system considering adverse effect to avian species and fish.
Methods for recovery, neutralization, containment and cleaning up.	Sweep up or clean with vacuum cleaner, collect and dispose of.
Prevention of secondary disaster	Not specified.

7. HANDLING AND STORAGE

Handling	
Engineering measures	Should process product under the recommended temperature range.(180 ~210°C, 356 ~ 410°F) Do not inhale gas during processing of product. Provide for sufficient ventilation. Do not hold product at high temperatures over an extended time. (See 10. STABILITY AND REACTIVITY) Do not extrude with strong acids, oxidizing reagent, and PVC. Wear eye protection, heat-resistant gloves, long-sleeved work clothing for burn prevention when handling melted resin. Avoid breathing gases generated from the melted resin.
Local exhaust, total ventilation	Use effective local exhaust at the generating point of gases because the gases are generated when handling melted resin using extruder or injection molding machine. Perform total ventilation by ventilation fan at indoor or working area operating above procedure.
Cautions to fire	At the room temperature, the polyacetal pellets are in no danger of the ignition and the explosion. However, do not use the fire recklessly because the force of the fire expansion is fast when a fire occurs once. (1) Do not use heater with open flame. (stove, open fire, etc) (2) Do not carry match, lighter. No smoking. (3) Ground facilities and equipments (extruder, molding machine, air-conveying line, bag filters, etc) in order to prevent static discharge. (4) Use safe non-sparking tools. (5) Avoid generation or approach of any other ignition sources.
Precautions for safe handling	(1) Do not eat or drink when using this product. (2) If leaked on the floor, remove and keep cleaned up. If leakage is left the floor becomes slippery and may cause a fall. (3) Determine and keep proper working process.
Storage	Store at the place where fulfills below storage conditions. (1) Protect from direct sunlight. (2) Protect from high temperature and humidity. (3) Store and keep away from ignition source. (4) Take precautionary measures against static discharge.

SAFETY DATA SHEET

Safe containers and packaging material	Containers and packaging materials should fulfill storage conditions.
8. EXPOSURE CONTROLS / PERSONAL PROTECTION	
Facility measures	See "7. HANDLING AND STORAGE" for facility measures.
Administrative level, allowable limit	Gases are generated from melted resin but administrative level and allowable limit are not established.
Dust	Allowable limit for this resin is not established in ACGIH. However below values are applicable for dust. (reference 1,2) PNOS: Particles(insoluble or poor soluble) NOT Otherwise Specified ACGIH TLV TWA Respirable 3 mg/m³ Inhalable 10 mg/m³ PNOR: Particles not otherwise regulated OSHA PEL TWA Respirable fraction 5 mg/m³ Total dust 15 mg/m³ Dust, general threshold limit value DFG MAK TWA 4 mg/m³ Reference information(reference 1,2) Formaldehyde ACGIH TLV TWA NIC-0.1 ppm NIC-0.12 mg/m³ STEL NIC-0.3 ppm NIC-0.37 mg/m³ Ceiling 0.3 ppm 0.37 mg/m³ Carcinogenicity category A2 NIC-A1 *NIC: Notice of Intended Changes OSHA PEL TWA 0.75 ppm STEL 2 ppm Carcinogenicity category Ca DFG MAK TWA 0.3 ppm 0.37 mg/m³ Ceiling 1 ppm 1.2 mg/m³ Carcinogenicity category 4
Protective equipment	
Respiratory protection	Wear dust control mask when dust is caused by the works such as machinery processing of resin product, sanding, removing resing powder from bag filter, cleaning of sieving machine.
Hand protection	It is recommended to wear hand protection if necesasry. Especially when handling melted resin, wear heat-resistant gloves for burn prevention.
Eye protection	It is recommended to wear side-shielded eye protection made with resin, resin goggles.

SAFETY DATA SHEET

Skin and body protection	Wear long-sleeved clothing when handling melted resin for burn prevention.
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9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Pellet
Physical state	Solid
Odor	Slight odor
pH	Not applicable
Melting point	155~173 °C(311 - 343 °F)
Decomposition point	260 °C (500 °F)
Ignition point	420 °C (788 °F)
Flash point	320 °C (608 °F)
Explosion limit Upper / lower	No data
Specific gravity	1.35 - 1.65
Solubility Water	Insoluble
Octanol/water partition coefficient	No data

10. STABILITY AND REACTIVITY

Stability	Stable at room temperature as far as stored protected from direct sunlight, away from fire or heat source.
Reactivity	Reactivity with water is none. Hazardous polymerization will not occur.
Conditions to avoid	Direct sunlight, fire, heat source and generation of its dust. Follow the recommended conditions below, to prevent decomposition. Processing at above 250 °C (482 °F) may result in releasing toxic and carcinogenic formaldehyde. The following limits are general guide; 1. Temperature should be lower for specific operating conditions. Optimal resin temperature : 180~210°C (356~410°F) Maximum resin temperature : 250°C (482°F) 2. When the resin temperature over the limit, conduct a purge. 3. If the injection molding machine is stopped, conduct a purge, and turn off the heater of cylinder. 4. When substitute to another resin, use non-colored Polyethylene, cleared Polystyrene and ASACLEAN (made by Asahi). 5. Do not mix product with pigments or additives other than those designated by Asahi, or with different resins or resin grades, as this may degrade product and cause decomposition. 6. In order to avoid auto ignition / hazardous decomposition of hot thick masses of resin, purging should be collected in small, flat shapes or thin strands to allow for rapid cooling in water.

SAFETY DATA SHEET

Materials to avoid	Incompatible with strong acid, base and oxidizing agents.
Hazardous decomposition products	May include and are not limited to: Formaldehyde as decomposition gas. When ignited, formaldehyde, CO and CO ₂ .

11. TOXICOLOGICAL INFORMATION

LD755 and ZLD75 contain crystalline silica (<0.3%) as impurities of Inorganic filler.

These products might contain Titanium dioxide (< 5wt%), Diiron trioxide (< 2wt%) and Carbon black (< 2wt%).

GHS classification is shown in the table below. This toxicological classification is based on reference 3,4, and 5.

	Resin Additives	Crystalline silica (LD755, ZLD75)	Carbon black (*1)	Titanium dioxide	Diiron trioxide	Classifications of the products
Content	90.7wt% ~	< 0.3wt%	< 2wt%	< 5wt%	< 2wt%	
Skin corrosion / Irritation	Can not be classified	Can not be classified	Can not be classified	Not classified	Category 2	Can not be classified (1)
Serious Eye Damage / Irritation	Can not be classified	Can not be classified	Can not be classified	Category 2B	Category 1	Can not be classified (2)
Carcinogenicity	Can not be classified	Category 1A	Can not be classified	Category 2	Not classified	Can not be classified (3)
Specific Target Organ Systematic Toxicity (Single Exposure)	Can not be classified	Category 1 (respiratory system)	Can not be classified	Can not be classified	Category 3 (respiratory tract irritation)	Can not be classified (4)
Specific Target Organ Systematic Toxicity (Repeated Exposure)	Can not be classified	Category 1 (respiratory system, kidney)	Can not be classified	Can not be classified	Category 1 (respiratory system)	Can not be classified for less than the limit concentration and (4)

The complex of metal oxides might be included in Additives. In the report (reference 6), the toxicological status of The complex of metal oxides are specified as " not applicable "

(*1) In the report (reference 5), the toxicological status of carbon black is specified as " not applicable "

Notes

- (1) The products cannot be classified because the hazardous substances are not exposed to the skin directly for they are covered by the product resin and not likely to be separated by the exudation etc.
- (2) The products cannot be classified because the hazardous substances are not exposed to the eyes directly for they are covered by the product resin and not likely to be separated by the exudation etc.
- (3) The carcinogenicity of Titanium dioxide is based on the lung tumor of rats, and was caused by inhalation of the ultrafine Titanium dioxide. The products cannot be classified because the Crystalline silica and the Titanium dioxide in the products are not inhaled as dust, gas, vapor and mist for they are covered by the product resin and not likely to be separated by the exudation etc

SAFETY DATA SHEET

Reference Information: Formaldehyde (CAS No. 50-00-0)

GHS Classification Hazardous to the aquatic environment (Acute) Category 2

13. DISPOSAL CONSIDERATIONS

Dispose of according to regulation and standard of regional government.

Avoid direct release of waste containing these products (effluent, solid and washing water) to the river or landfill. In case of incineration treat by the method in accordance with relevant laws such as Air Pollution Control Law using the incinerator. Remove all the residues before disposal of the container (paper bag, drum, flexible container) of these products after use, dispose of in accordance with relevant laws and do not re-use for other usage.

14. TRANSPORT INFORMATION

International regulations:

IMDG	Not Regulated
ICAO-TI/ IATA-DGR	Not Regulated
UN Classification	Not Regulated
UN Number	Not Regulated
Domestic regulations	Not Regulated
Marine pollutant	Not Regulated
U.S. Department of Transportation (D.O.T)	These products are not regulated by D.O.T.
Special safety precautions and conditions during transport	Do not handle roughly and keep dry not to break packaging bag. If the bag is broken and pellet is spilt, pay attention not to fall by slippery floor. If transported by air-conveying line take prevention measures against static discharge.

15. REGULATORY INFORMATION

United States

OSHA	These products are not hazardous as defined by the OSHA HAZARD COMMUNICATION STANDARD (29 CFR 1910.1200)
TSCA	
40 CFR 799 Subpart B,C	Not Applicable
40 CFR 721 Subpart E	Not Applicable
40 CFR 707 Subpart D	Not Applicable
40 CFR 747,749,761~3,766	Not Applicable
40 CFR 712(d),(e)	Not Applicable
CERCLA/ SUPERFUND(40 CFR 117,302)	These products contain no Reportable Quantity (RQ) Substances.

SAFETY DATA SHEET

SARA HAZARD CATEGORY	These products have been reviewed according to the EPA Hazard Categories promulgated under SECTION 311 and 312 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the Following categories: Not to have met any hazard category.															
SARA 313 INFORMATION	These products contain no substance subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.															
U.S. STATE REGULATIONS	California Proposition 65 These products contain formaldehyde <table><tr><td>Chemical name</td><td>Max. content</td><td>Chemical status</td></tr><tr><td>Formaldehyde</td><td>40 ppm</td><td>Cancer</td></tr></table> These products might be included Carbon black, Titanium oxide. <table><tr><td>Chemical name</td><td>Max. content</td><td>Chemical status</td></tr><tr><td>Carbon Black</td><td>2 %</td><td>Cancer</td></tr><tr><td>Titanium dioxide</td><td>5 %</td><td>Cancer</td></tr></table> These products contain formaldehyde, and might be included Carbon black, Titanium oxide, and Iron oxide. These ingredients might be governed by various state regulations in U.S. * Please use these products after confirming the state regulations.	Chemical name	Max. content	Chemical status	Formaldehyde	40 ppm	Cancer	Chemical name	Max. content	Chemical status	Carbon Black	2 %	Cancer	Titanium dioxide	5 %	Cancer
Chemical name	Max. content	Chemical status														
Formaldehyde	40 ppm	Cancer														
Chemical name	Max. content	Chemical status														
Carbon Black	2 %	Cancer														
Titanium dioxide	5 %	Cancer														

EU

(EC) 1272/2008 AnnexVI table-3.1	Not Applicable								
(EC) 1272/2008 AnnexVI table-3.2	Not Applicable								
(EC) 1272/2008(CLP)	Not Applicable								
REACH Annex XIV	Not Applicable								
REACH Annex XVII	The products in some colors may contain a small amount of nickel compounds as the complex of metal oxides. <table border="1"> <thead> <tr> <th>CAS No.</th><th>Maximun content</th></tr> </thead> <tbody> <tr> <td>68186-85-6</td><td>0.4wt%</td></tr> <tr> <td>8007-18-9</td><td>0.2wt%</td></tr> <tr> <td>69011-05-8</td><td>0.5wt%</td></tr> </tbody> </table>	CAS No.	Maximun content	68186-85-6	0.4wt%	8007-18-9	0.2wt%	69011-05-8	0.5wt%
CAS No.	Maximun content								
68186-85-6	0.4wt%								
8007-18-9	0.2wt%								
69011-05-8	0.5wt%								
SVHC (REACH)	Does not contain more than 0.1wt%								
ELV (2011/37/EU)	Does not contain more than limit value.								
RoHS(2011/65/EU)	Does not contain more than limit value.								

China

Limited toxic chemical substances for export	Not Applicable
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SAFETY DATA SHEET

Prohibited cargo list for import and export	Not Applicable
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List of Dangerous Goods	Not Applicable
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List of Hazardous Chemicals	Not Applicable
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General rule for classification and hazard communication of chemicals. (GB.13690)	Not Applicable
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Korea

Prohibited or Restricted substances	Not Applicable
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Toxic substances	Not Applicable
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Substances requiring preparation for accidents	Not Applicable
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Taiwan

Toxic substances (Toxic Chemical Substance Control Act)	Not Applicable
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16. OTHER INFORMATION

NOTE : The information furnished in this Material Safety Data Sheet is accurate to the best knowledge of Asahi Kasei Chemicals Corporation ("Asahi") as of the date of its publication. This SDS is not intended to create any liability of any kind on the part of Asahi.

In no event will Asahi be responsible for any death, injury or damage of any nature resulting from the use of, reliance upon, or misuse of the SDS or material to which it refers. The data on this sheet relates only to the specific material designated herein.

No representations or warranties, whether express or implied, of merchantability, fitness for particular purpose, or any other nature, are made hereunder.

This SDS is not intended as a recommendation for uses that infringe valid patents or extend licenses under valid patents. This SDS is furnished under the express condition that all persons receiving it will make their own determination as to its suitability for their purpose prior to use.

Responsibility for compliance with applicable all national and local regulations concerning dissemination of the SDS and sale and use of the material to which it refer rests solely upon the purchaser. For more information, please contact Asahi at the address and telephone number listed on this sheet.

Reference

SAFETY DATA SHEET

- 1) ACGIH, "Guide to Occupational Exposure Value", (2016)
- 2) ACGIH, "TLVs, and BEIs Based on the Documentation of the Threshold Values for Chemical Substances and Physical Agents & Biological Exposure Indices", (2016)
- 3) Incorporated Administrative Agency National Institute of Technology and Evaluation, GHS classification database. http://www.safe.nite.go.jp/ghs/ghs_download.html
- 4) Ministry of Health, Labour and Welfare, Safety Site of the workplace, GHS model Safety Data Sheet information. http://anzeninfo.mhlw.go.jp/anzen_pg/GHS_MSD_FND.aspx
- 5) Japan carbon black association, " The safety of carbon black as Nano-materials "(2013)
- 6) Japan Complex Inorganic Colored Pigment Association, "Safety of CICP",
<http://www.kaseikyo.jp/jcicpa-e/safety-of-cicp-e/>