

# FERRIC SULPHATE HYDRATE

GHS Safety Data Sheet

Version No:2.0

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## Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

### PRODUCT NAME

FERRIC SULPHATE

### OTHER NAMES

Fe<sub>2</sub>-H<sub>18</sub>-O<sub>21</sub>-S<sub>3</sub>, Fe<sub>2</sub>(SO<sub>4</sub>)<sub>3</sub>.9H<sub>2</sub>O, "iron persulphate persulfate", "sulfuric acid, iron(3+) salt (3:2) hydrate", "iron (III) sulfate sulphate", "iron (III) sulfate sulphate", nonahydrate, enneahydrate, "ferric sulphate sulfate"

### PRODUCT USE

Preparation of iron alums, iron salts and pigments. As a flocculent in water purification and sewerage treatment; in etching aluminium, in pickling stainless steel and copper; and in soil conditioners.

As a mordant in textile dyeing and calico printing; a polymerisation catalyst; in chelated iron products and as a chemical intermediate.

### SUPPLIER

Company: S D FINE- CHEM LIMITED

Address:

315- 317, T.V. INDUSTRIAL ESTATE,

248, WORLI,

MUMBAI- 400030.INDIA.

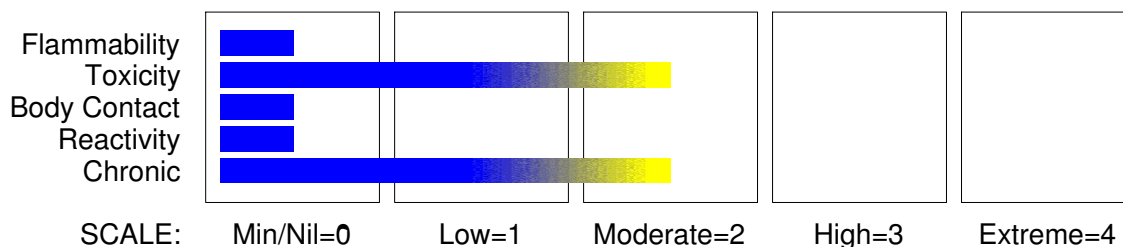
technical@sdfine.com

Telephone: 91- 22- 24959898

Telephone: 91- 22- 24959899

Fax: 91- 22- 24937232

### HAZARD RATINGS



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## Section 2 - HAZARDS IDENTIFICATION

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### EMERGENCY OVERVIEW

#### HAZARD

Not hazardous

No hazards determined by using GHS criteria

#### PRECAUTIONARY STATEMENTS

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## Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

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| NAME                                         | CAS RN     | %   |
|----------------------------------------------|------------|-----|
| ferric sulfate                               | 10028-22-5 | >99 |
| (Note: Commercial form is usually hydrated.) |            |     |

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## Section 4 - FIRST AID MEASURES

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### SWALLOWED

For advice, contact a Poisons Information Centre or a doctor.

- If swallowed do NOT induce vomiting.
- If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.
- Observe the patient carefully.
- Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious
- Give water to rinse out mouth, then provide liquid slowly and as much as casualty can comfortably drink.
- Seek medical advice.

### EYE

If this product comes in contact with the eyes:

- Wash out immediately with fresh running water.
- Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.
- If pain persists or recurs seek medical attention.
- Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

### SKIN

If skin contact occurs:

- Immediately remove all contaminated clothing, including footwear.
- Flush skin and hair with running water (and soap if available).
- Seek medical attention in event of irritation.

### INHALED

- If fumes or combustion products are inhaled remove from contaminated area.
- Lay patient down. Keep warm and rested.
- Prostheses such as false teeth, which may block airway, should be removed, where

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## Section 4 - FIRST AID MEASURES

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possible, prior to initiating first aid procedures.

- Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary.
- Transport to hospital, or doctor.

### NOTES TO PHYSICIAN

For acute or short term repeated exposures to iron and its derivatives:

- Always treat symptoms rather than history.
- In general, however, toxic doses exceed 20 mg/kg of ingested material (as elemental iron) with lethal doses exceeding 180 mg/kg.
- Control of iron stores depend on variation in absorption rather than excretion.

Absorption occurs through aspiration, ingestion and burned skin.

- Hepatic damage may progress to failure with hypoprothrombinaemia and hypoglycaemia.

Hepatorenal syndrome may occur.

- Iron intoxication may also result in decreased cardiac output and increased cardiac pooling which subsequently produces hypotension.

· Serum iron should be analysed in symptomatic patients. Serum iron levels (2-4 hrs post-ingestion) greater than 100 ug/dL indicate poisoning with levels, in excess of 350 ug/dL, being potentially serious. Emesis or lavage (for obtunded patients with no gag reflex) are the usual means of decontamination.

- Activated charcoal does not effectively bind iron.

· Catharsis (using sodium sulfate or magnesium sulfate) may only be used if the patient already has diarrhoea.

· Deferoxamine is a specific chelator of ferric (3+) iron and is currently the antidote of choice. It should be administered parenterally. [Ellenhorn and Barceloux: Medical Toxicology].

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## Section 5 - FIRE FIGHTING MEASURES

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### EXTINGUISHING MEDIA

- Use extinguishing media suitable for surrounding area.

### FIRE FIGHTING

Alert Fire Brigade and tell them location and nature of hazard.

- Wear breathing apparatus plus protective gloves for fire only.
- Prevent, by any means available, spillage from entering drains or water courses.

Use fire fighting procedures suitable for surrounding area.

Use water delivered as a fine spray to control the fire and cool adjacent area.

DO NOT approach containers suspected to be hot.

If safe to do so, remove containers from path of fire.

### FIRE/EXPLOSION HAZARD

- Non combustible.
  - Not considered a significant fire risk, however containers may burn.
- Decomposes on heating and produces toxic fumes of: sulfur oxides (SO<sub>x</sub>).

### FIRE INCOMPATIBILITY

No known incompatibility with normal range of industrial materials.

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## Section 6 - ACCIDENTAL RELEASE MEASURES

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### EMERGENCY PROCEDURES

#### MINOR SPILLS

- Clean up all spills immediately.
- Avoid contact with skin and eyes.
- Wear impervious gloves and safety glasses.
- Use dry clean up procedures and avoid generating dust.
- Sweep up or
- Vacuum up (consider explosion-proof machines designed to be grounded during storage and use).
- Place spilled material in clean, dry, sealable, labelled container.

#### MAJOR SPILLS

- Clear area of personnel and move upwind.
- Alert Fire Brigade and tell them location and nature of hazard.
- Control personal contact by using protective equipment and dust respirator.
- Prevent spillage from entering drains, sewers or water courses.
- Avoid generating dust.
- Sweep, shovel up. Recover product wherever possible.
- Put residues in labelled plastic bags or other containers for disposal.
- If contamination of drains or waterways occurs, advise emergency services.

### EMERGENCY RESPONSE PLANNING GUIDELINES (ERPG)

The maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to one hour WITHOUT experiencing or developing

life-threatening health effects is:

ferric sulfate 75 mg/m<sup>3</sup>

irreversible or other serious effects or symptoms which could impair an individual's ability to take protective action is:

ferric sulfate 15 mg/m<sup>3</sup>

other than mild, transient adverse effects without perceiving a clearly defined odour is:

ferric sulfate 10 mg/m<sup>3</sup>

The threshold concentration below which most people will experience no appreciable risk of health effects:

ferric sulfate 3.5 mg/m<sup>3</sup>

American Industrial Hygiene Association (AIHA)

Ingredients considered according to the following cutoffs

|                 |          |               |         |
|-----------------|----------|---------------|---------|
| Very Toxic (T+) | >= 0.1%  | Toxic (T)     | >= 3.0% |
| R50             | >= 0.25% | Corrosive (C) | >= 5.0% |
| R51             | >= 2.5%  |               |         |
| else            | >= 10%   |               |         |

where percentage is percentage of ingredient found in the mixture

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## Section 6 - ACCIDENTAL RELEASE MEASURES

### SAFE STORAGE WITH OTHER CLASSIFIED CHEMICALS



+ + + + + +

*+: May be stored together*

*O: May be stored together with specific precautions*

*X: Must not be stored together*

**Personal Protective Equipment advice is contained in Section 8 of the MSDS.**

## Section 7 - HANDLING AND STORAGE

### PROCEDURE FOR HANDLING

- Limit all unnecessary personal contact.
- Wear protective clothing when risk of exposure occurs.
- Use in a well-ventilated area.
- When handling DO NOT eat, drink or smoke.
- Always wash hands with soap and water after handling.
- Avoid physical damage to containers.
- Use good occupational work practice.
- Observe manufacturer's storing and handling recommendations.

### SUITABLE CONTAINER

Multi-ply paper bag with sealed plastic liner or heavy gauge plastic bag.

NOTE: Bags should be stacked, blocked, interlocked, and limited in height so that they are stable and secure against sliding or collapse. Check that all containers are clearly labelled and free from leaks. Packing as recommended by manufacturer.

DO NOT USE brass or copper containers / stirrers.

DO NOT use aluminium, galvanised or tin-plated containers.

### STORAGE INCOMPATIBILITY

Avoid contact with aluminium and its alloys, galvanised iron and copper and its alloys.

### STORAGE REQUIREMENTS

Observe manufacturer's storing and handling recommendations.

Store in original containers.

Keep containers securely sealed.

Store in a cool, dry place.

Store in a well-ventilated area.

Store away from incompatible materials.

DO NOT use mild steel or galvanised containers.

Protect containers against physical damage.

Check regularly for spills and leaks.

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## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

### EXPOSURE CONTROLS

The following materials had no OELs on our records

• ferric sulfate:

CAS:10028- 22- 5 CAS:15244- 10- 7

### MATERIAL DATA

The recommended TLV is thought to reduce the likelihood of respiratory irritation and skin irritation from exposure to aerosols and mists of soluble iron salts.

### PERSONAL PROTECTION



#### EYE

- Safety glasses with side shields; or as required,
- Chemical goggles.
- Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lens or restrictions on use, should be created for each workplace or task. This should include a review of lens absorption and adsorption for the class of chemicals in use and an account of injury experience. Medical and first-aid personnel should be trained in their removal and suitable equipment should be readily available. In the event of chemical exposure, begin eye irrigation immediately and remove contact lens as soon as practicable. Lens should be removed at the first signs of eye redness or irritation - lens should be removed in a clean environment only after workers have washed hands thoroughly. [CDC NIOSH Current Intelligence Bulletin 59].

#### HANDS/FEET

PVC gloves or Rubber gloves and · Barrier cream.  
Safety footwear.

#### OTHER

- Overalls.
- Eyewash unit. Plastic apron.

Ensure there is ready access to an emergency shower.

#### RESPIRATOR

| Protection Factor | Half- Face Respirator | Full- Face Respirator | Powered Air Respirator |
|-------------------|-----------------------|-----------------------|------------------------|
| 10 x ES           | P1 Air- line*         | - -                   | PAPR- P1 -             |
| 50 x ES           | Air- line**           | P2                    | PAPR- P2               |
| 100 x ES          | -                     | P3                    | -                      |
|                   |                       | Air- line*            | -                      |
| 100+ x ES         | -                     | Air- line**           | PAPR- P3               |

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## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

\* - Negative pressure demand \*\* - Continuous flow.

The local concentration of material, quantity and conditions of use determine the type of personal protective equipment required.

For further information consult  
your

Occupational Health and Safety Advisor.

### ENGINEERING CONTROLS

General exhaust is adequate under normal operating conditions. If risk of overexposure exists, wear SAA approved respirator. Correct fit is essential to obtain adequate protection. Provide adequate ventilation in warehouse or closed storage areas. Air contaminants generated in the workplace possess varying "escape" velocities which, in turn, determine the "capture velocities" of fresh circulating air required to effectively remove the contaminant.

Type of Contaminant:

solvent, vapours, degreasing etc., evaporating  
from tank (in still air)

aerosols, fumes from pouring operations,  
intermittent container filling, low speed  
conveyer transfers, welding, spray drift,  
plating acid fumes, pickling (released at low  
velocity into zone of active generation)

direct spray, spray painting in shallow booths,  
drum filling, conveyer loading, crusher dusts,  
gas discharge (active generation into zone of  
rapid air motion)

grinding, abrasive blasting, tumbling, high  
speed wheel generated dusts (released at high  
initial velocity into zone of very high rapid  
air motion).

Air Speed:

0.25- 0.5 m/s (50- 100 f/min)

0.5- 1 m/s (100- 200 f/min.)

1- 2.5 m/s (200- 500 f/min)

2.5- 10 m/s (500- 2000 f/min.)

Within each range the appropriate value depends on:

Lower end of the range

1: Room air currents minimal or favourable to  
capture

2: Contaminants of low toxicity or of nuisance  
value only

3: Intermittent, low production.

4: Large hood or large air mass in motion

Upper end of the range

1: Disturbing room air currents

2: Contaminants of high toxicity

3: High production, heavy use

4: Small hood - local control only

Simple theory shows that air velocity falls rapidly with distance away from the opening of a simple extraction pipe. Velocity generally decreases with the square of distance from the extraction point (in simple cases). Therefore the air speed at the extraction point should be adjusted, accordingly, after reference to distance from the contaminating source. The air velocity at the extraction fan, for example, should be a minimum of 1-2 m/s (200-400 f/min.) for extraction of solvents generated in a tank 2 meters distant from the extraction point. Other mechanical considerations, producing performance deficits within the extraction apparatus, make it essential that theoretical air velocities are multiplied by factors of 10 or more when extraction systems are installed or used.

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## Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

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### APPEARANCE

Grey to tan or light greenish/yellow powder or crystals. Hygroscopic.  
Commercial product contains about 20% water and is yellow in colour.  
Odourless. Soluble in water.  
Sparingly soluble in alcohol; insoluble in acetone, ethyl acetate,  
H<sub>2</sub>SO<sub>4</sub> (hydrogen sulphate), and NH<sub>3</sub> (ammonia).

### PHYSICAL PROPERTIES

Solid.  
Mixes with water.

Molecular Weight: 562 nonahydrate  
Melting Range (°C): 175 loses water  
Solubility in water (g/L): Miscible  
pH (1% solution): Not available.  
Volatile Component (%vol): Not applicable.  
Relative Vapour Density (air=1): Not applicable  
Lower Explosive Limit (%): Not applicable  
Autoignition Temp (°C): Not applicable  
State: Divided solid

Boiling Range (°C): Not available.  
Specific Gravity (water=1): 2.1  
pH (as supplied): Not applicable  
Vapour Pressure (kPa): Negligible.  
Evaporation Rate: Not applicable  
Flash Point (°C): Not applicable  
Upper Explosive Limit (%): Not applicable  
Decomposition Temp (°C): 480

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## Section 10 - CHEMICAL STABILITY AND REACTIVITY INFORMATION

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### CONDITIONS CONTRIBUTING TO INSTABILITY

- Presence of incompatible materials.
- Product is considered stable.
- Hazardous polymerisation will not occur.

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## Section 11 - TOXICOLOGICAL INFORMATION

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### POTENTIAL HEALTH EFFECTS

#### ACUTE HEALTH EFFECTS

##### SWALLOWED

Accidental ingestion of the material may be damaging to the health of the individual.  
Considered an unlikely route of entry in commercial/industrial environments.  
Considered to be non toxic.  
Ingestion may result in nausea, abdominal irritation, pain and vomiting.  
Sulfate salts are poorly absorbed from the gastro-intestinal tract but because of osmotic activity are able to draw water from the lumen to produce diarrhoea (purging). Sulfate ion usually has little toxicological potential.  
Iron poisoning, although rare, may result in epigastric pain and vomiting followed over 6-8 hours by shock, and in severe case coma and death. The toxicity of iron compounds increases in proportion to their solubility in the gastrointestinal tract. Vomitus frequently contains blood, due in part to capillary dilation and blood loss through

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## Section 11 - TOXICOLOGICAL INFORMATION

gastrointestinal walls (diapedesis). Watery diarrhoea with ribbons of bowel mucosa contribute to cardiovascular collapse from fluid and electrolyte loss. Although a quiescent period may follow some victims relapse within 12 hours into lethal secondary shock. During relapse a profound metabolic acidosis is encountered. This has been attributed to hydrolysis of ferric ions in blood as well as increases in the level of lactic and citric acids. Respiratory changes resulting from acidosis are often evident. Postmortem examination often reveals liver damage consisting of periportal haemorrhagic necrosis. Poisoning may also produce a metallic taste, restlessness, lethargy, hypotonia, coma, pallor or cyanosis, fast, weak pulse, hypotension, hyperventilation (due to acidosis), shock, vasomotor instability and cardiovascular collapse. Pneumonitis, pulmonary oedema and haemorrhage, convulsions, liver impairment with jaundice, hypoglycaemia, multiple coagulation defects, kidney damage with anuria, pancreatic damage, vascular damage, hypovolaemia, haemoconcentration, profound shock and vascular collapse have been reported. Survivors may display gastric scarring or obstruction, pyloric obstruction or stenosis, mild hepatic scirrhosis or neuralgic sequelae.

### EYE

Although the material is not thought to be an irritant (as classified by EC Directives), direct contact with the eye may produce transient discomfort characterised by tearing or conjunctival redness (as with windburn).

### SKIN

The material is not thought to produce adverse health effects or skin irritation following contact (as classified by EC Directives using animal models). Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable gloves be used in an occupational setting.

The material may accentuate any pre-existing skin condition.

### INHALED

The material is not thought to produce adverse health effects or irritation of the respiratory tract (as classified by EC Directives using animal models). Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable control measures be used in an occupational setting.

Not normally a hazard due to non-volatile nature of product.

### CHRONIC HEALTH EFFECTS

Principal routes of exposure are by accidental skin and eye contact and inhalation of generated dusts.

Chronic excessive iron intakes have been associated with haemosiderosis and consequent possible damage to the liver and pancreas.

High levels of iron may raise the risk of cancer. This concern stems from the theory that iron causes oxidative damage to tissues and organs by generating highly reactive chemicals, called free radicals, which subsequently react with DNA. Cells may be disrupted and may become cancerous. People whose genetic disposition prevents them from keeping tight control over iron (e.g. those with the inherited disorder, haemochromatosis) may be at increased risk.

Iron overload in men may lead to diabetes, arthritis, liver cancer, heart irregularities and problems with other organs as iron builds up.

[K. Schmidt, New Scientist, No. 1919 pp.11-12, 2nd April, 1994].

As with any chemical product, contact with unprotected bare skin; inhalation of vapour, mist or dust in work place atmosphere; or ingestion in any form, should be avoided by observing good occupational work practice.

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## Section 11 - TOXICOLOGICAL INFORMATION

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### TOXICITY AND IRRITATION

No significant acute toxicological data identified in literature search.  
Bacterial mutagen

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## Section 12 - ECOLOGICAL INFORMATION

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No data for ferric sulfate.

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## Section 13 - DISPOSAL CONSIDERATIONS

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- Recycle wherever possible or consult manufacturer for recycling options.
  - Consult State Land Waste Management Authority for disposal.
  - Bury residue in an authorised landfill.
  - Recycle containers if possible, or dispose of in an authorised landfill.
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## Section 14 - TRANSPORTATION INFORMATION

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HAZCHEM: None

NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS:UN, IATA,  
IMDG

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## Section 15 - REGULATORY INFORMATION

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### REGULATIONS

ferric sulfate (CAS: 10028-22-5) is found on the following regulatory lists;  
International Council of Chemical Associations (ICCA) - High Production Volume List  
OECD Representative List of High Production Volume (HPV) Chemicals

ferric sulfate (CAS: 15244-10-7) is found on the following regulatory lists;  
International Council of Chemical Associations (ICCA) - High Production Volume List  
OECD Representative List of High Production Volume (HPV) Chemicals

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## Section 16 - OTHER INFORMATION

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### INGREDIENTS WITH MULTIPLE CAS NUMBERS

| Ingredient Name | CAS                        |
|-----------------|----------------------------|
| ferric sulfate  | 10028- 22- 5, 15244- 10- 7 |

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## Section 16 - OTHER INFORMATION

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The above information is believed to be accurate and represent the best information currently available to us, but does not represent any warranty expressed or implied of the properties of the product. User should make their own investigation to determine the suitability of the information for their particular purpose.

Issue Date: 5-Apr-2018