HYDROCORTISONE ACETATE

Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME
HYDROCORTISONE ACETATE

OTHER NAMES

C21-H30-O5, cortisol, 11beta-hydrocortisone, "hydrocortisone free alcohol", hydrocortone, 17-hydroxycorticosterone, hydroxycortisone, 11-beta-hydroxycortisone

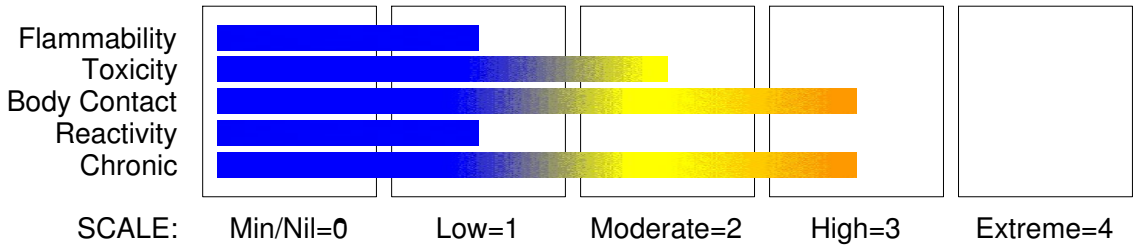
PRODUCT USE
Hydrocortisone is the main glucocorticoid secreted from the adrenal cortex. Administered by mouth for replacement therapy in Addison's disease or chronic adrenocortical insufficiency secondary to hypopituitarism. When a rapid efect is required such as in post-adrenalectomy crises, during the acute phases of status asthmaticus and in allergic crises such as laryngeal oedema and drug sensitivity, hydrocortisone is given by slow intravenous infusion. Also applied topically in the treatment of various skin disorders.
The acetate is the preferred injectable form and is administered intra-articularly into joints affected by rheumatoid arthritis, osteoarthritis and similar conditions.

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

continued...

Telephone: 91- 22- 24959899
Fax: 91- 22- 24937232

HAZARD RATINGS



Section 2 - HAZARDS IDENTIFICATION

GHS Classification

Reproductive Toxicity Category 1B
Skin Sensitizer Category 1

EMERGENCY OVERVIEW

HAZARD

DANGER
Determined by using GHS criteria:
H317 H360
May cause allergic skin reaction
May damage the unborn child

PRECAUTIONARY STATEMENTS

Prevention

Obtain special instructions before use.
Avoid breathing dust/fume/gas/mist/vapours/spray.
Contaminated clothing should not be allowed out of the workplace.
Use personal protective equipment as required.
Do not handle until all safety precautions have been read and understood.

Response

If exposed or concerned: Get medical attention advice.
If skin irritation or rash occurs, seek medical advice/attention.
Specific treatment: refer to Label or MSDS.
IF ON SKIN: Gently wash with plenty of soap and water.
Wash contaminated clothing before reuse.

continued...

Storage

Store locked up.

Disposal

Dispose of contents and container in accordance with relevant legislation.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
hydrocortisone	50-23-7	>95

Section 4 - FIRST AID MEASURES

SWALLOWED

For advice, contact a Poisons Information Centre or a doctor.
Poison Information Centres in each State capital city can provide additional assistance.

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 dust is inhaled, remove from contaminated area.
· Encourage patient to blow nose to ensure clear passage of breathing.
· If irritation or discomfort persists seek medical attention.

NOTES TO PHYSICIAN

The adverse effects of corticosteroids are almost always due to their use in excess of physiological requirements. Symptomatic treatment is called for. Where possible the dose should be withdrawn or reduced. Acute renal insufficiency should be treated with intravenous hydrocortisone sodium succinate with infusions of 0.9% dextrose. MARTINDALE, The Extra Pharmacopoeia, 29th Ed.
Patients or individuals exposed regularly in an occupational setting, should be evaluated periodically for evidence of HPA axis suppression. The evaluation may be performed by using the ACTH stimulation, A.M. plasma cortisol and urinary free cortisol tests. If HPA axis suppression is confirmed the individual should be removed from exposure. Recovery of the HPA axis function is generally prompt upon exposure cessation. Infrequently, signs and symptoms of glucocorticosteroid insufficiency may occur, requiring supplemental systemic corticosteroids.

continued...

Section 5 - FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA
· Foam.
· Dry chemical powder.
· BCF (where regulations permit).
· Carbon dioxide.
· Water spray or fog - Large fires only.

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.
· DO NOT approach containers suspected to be hot.
· Cool fire exposed containers with water spray from a protected location.
· If safe to do so, remove containers from path of fire.
· Equipment should be thoroughly decontaminated after use.

FIRE/EXPLOSION HAZARD
· Solid which exhibits difficult combustion or is difficult to ignite.
· Avoid generating dust, particularly clouds of dust in a confined or unventilated space as dusts may form an explosive mixture with air, and any source of ignition, i.e. flame or spark, will cause fire or explosion. Dust clouds generated by the fine grinding of the solid are a particular hazard; accumulations of fine dust may burn rapidly and fiercely if ignited.
· Dry dust can also be charged electrostatically by turbulence, pneumatic transport, pouring, in exhaust ducts and during transport.
· Build-up of electrostatic charge may be prevented by bonding and grounding.
· Powder handling equipment such as dust collectors, dryers and mills may require additional protection measures such as explosion venting.
· All movable parts coming in contact with this material should have a speed of less than 1-metre/sec.

FIRE INCOMPATIBILITY
Avoid contamination with oxidising agents i.e. nitrates, oxidising acids, chlorine bleaches, pool chlorine etc. as ignition may result.

Personal Protective Equipment
Breathing apparatus.
Gas tight chemical resistant suit.
Limit exposure duration to 1 BA set 30 mins.

Section 6 - ACCIDENTAL RELEASE MEASURES

EMERGENCY PROCEDURES

MINOR SPILLS
- Remove all ignition sources.
- Clean up all spills immediately.
- Avoid contact with skin and eyes.

continued...

- Control personal contact by using protective equipment.
- Use dry clean up procedures and avoid generating dust.
- Place in a suitable labelled container for waste disposal.

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.

SAFE STORAGE WITH OTHER CLASSIFIED CHEMICALS

\+ + + + + +

+: May be stored together
O: May be stored together with specific preventions
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

- Avoid generating and breathing dust
- Avoid contact with skin and eyes.
- Wear nominated personal protective equipment when handling.
- Use in a well-ventilated area.
- Use good occupational work practices.
- Observe manufacturer's storing and handling recommendations.

SUITABLE CONTAINER

Packaging as recommended by manufacturer.
· Check that containers are clearly labelled.
Plastic container.

STORAGE INCOMPATIBILITY

Avoid reaction with oxidising agents.
Heat and light accelerate decomposition.
Be sure container is tightly closed when not in use.

STORAGE REQUIREMENTS

- Store in original containers.
- Keep containers securely sealed.
- Store in a cool, dry, well-ventilated area.
- Store away from incompatible materials and foodstuff containers.

continued...

· Protect containers against physical damage and check regularly for leaks.
· Observe manufacturer's storing and handling recommendations.
NOTE: Store in the dark.

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE CONTROLS

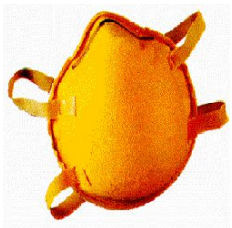
The following materials had no OELs on our records

• hydrocortisone: CAS:50- 23- 7 CAS:8056- 08- 4 CAS:8063- 42- 1 CAS:80562- 38- 5

MATERIAL DATA

CEL TWA: 0.02 mg/m3
(compare Merck, Sharp and Dohme recommendation for dexamethasone)
All corticosteroids have numerous and varied pharmacological actions. In humans, single dose or short term (several days) use is virtually without harmful effects. However prolonged therapeutic use of cortico-steroids may result in suppression of pituitary function. The daily threshold dose for this effect is approximately 0.5 mg for a 50 kg individual. Therefore typical exposure limits of about 0.02 mg/m3 have been calculated from the threshold dose. This is thought to provide about a two-fold safety factor.

PERSONAL PROTECTION

EYE

No special equipment needed when handling small quantities of substance.
For bulk handling wear:
Chemical goggles or
Face shield.

HANDS/FEET

Rubber gloves
PVC gloves
Protective shoe covers
Head covering.

OTHER

No special equipment when handling small quantities of substance otherwise:
Coveralls
For Emergencies:
Vinyl suit
Safety shower

continued...

RESPIRATOR

High Efficiency Dust Respirator (P2, P3)
For non-routine emergencies wear full face mask self-contained breathing apparatus.

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

* - 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

Enclosed local exhaust ventilation is required at points of dust, fume or vapour generation.
HEPA terminated local exhaust ventilation should be considered at point of generation of dust, fumes or vapours.
Barrier protection or laminar flow cabinets should be considered for laboratory scale handling.
When handling quantities up to 500 kilogram,work in either a standard laboratory with general dilution ventilation (e.g. 6-12 air changes per hour) is preferred. Quantities up to 1 kilogram may require a designated laboratory using fume hood, biological safety cabinet, or approved vented enclosures. Quantities exceeding 1 kilogram should be handled in a designated laboratory or containment laboratory using appropriate barrier/ containment technology.
Manufacturing and pilot plant operations require barrier/ containment and direct coupling technologies.
Barrier/ containment technology and direct coupling (totally enclosed processes that create a barrier between the equipment and the room) typically use double or split butterfly valves and hybrid unidirectional airflow/ local exhaust ventilation solutions (e.g. powder containment booths). Glove bags, isolator glove box systems are optional.
HEPA filtration of exhaust from dry product handling areas is required.
Fume-hoods and other open-face containment devices are acceptable when face velocities of at least 1 m/s (200 feet/minute) are achieved. Partitions, barriers, and other partial containment technologies are required to prevent migration of the material to uncontrolled areas. For non-routine emergencies maximum local and general exhaust are necessary. 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:	Air Speed:
solvent, vapours, etc. evaporating from tank (in still air)	0.25- 0.5 m/s (50- 100 f/min.)
aerosols, fumes from pouring operations, intermittent container filling, low speed conveyer transfers (released at low velocity into zone of active generation)	0.5- 1 m/s (100- 200 f/min.)

continued...

direct spray, drum filling, conveyer loading, crusher dusts, gas discharge (active generation into zone of rapid air motion)	1- 2.5 m/s (200- 500 f/min.)

Within each range the appropriate value depends on:

Lower end of the range	Upper end of the range
1: Room air currents minimal or favourable to capture	1: Disturbing room air currents
2: Contaminants of low toxicity or of nuisance value only.	2: Contaminants of high toxicity
3: Intermittent, low production.	3: High production, heavy use
4: Large hood or large air mass in motion	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 1-2.5 m/s (200-500 f/min.) for extraction of gases discharged 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.

The need for respiratory protection should also be assessed where incidental or accidental exposure is anticipated: Dependent on levels of contamination, PAPR, full face air purifying devices with P2 or P3 filters or air supplied respirators should be evaluated.
The following protective devices are recommended where exposures exceed the recommended exposure control guidelines by factors of:
10; high efficiency particulate (HEPA) filters or cartridges
10-25; loose-fitting (Tyvek or helmet type) HEPA powered-air purifying respirator.
25-50; a full face-piece negative pressure respirator with HEPA filters
50-100; tight-fitting, full face-piece HEPA PAPR
100-1000; a hood-shroud HEPA PAPR or full face-piece supplied air respirator operated in pressure demand or other positive pressure mode.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE

Odourless white crystalline powder, tasteless at first followed by a persistant bitter after-taste: does not mix well with water (280 mg/lt). Mixes with alcohol (1:40), acetone (1:80), propylene glycol (1:100).

PHYSICAL PROPERTIES

Solid.
Does not mix with water.

Molecular Weight: 362.5	Boiling Range (°C): Not applicable
Melting Range (°C): 214 (decomp)	Specific Gravity (water=1): Not available

continued...

Solubility in water (g/L): Immiscible
pH (1% solution): Not available
Volatile Component (%vol): Negligible
Relative Vapour Density (air=1): Not available
Lower Explosive Limit (%): Not available
Autoignition Temp (°C): Not available
State: Divided solid

pH (as supplied): Not applicable
Vapour Pressure (kPa): Negligible
Evaporation Rate: Not available
Flash Point (°C): Not available
Upper Explosive Limit (%): Not available
Decomposition Temp (°C): 214

log Kow (Sangster 1997): 1.61

Section 10 - CHEMICAL STABILITY AND REACTIVITY INFORMATION

CONDITIONS CONTRIBUTING TO INSTABILITY

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

Section 11 - TOXICOLOGICAL INFORMATION

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS

SWALLOWED

Accidental ingestion of the material may be damaging to the health of the individual. Corticosteroids (glucocorticoids) affect carbohydrate, protein and fat metabolism, the cardiovascular system, kidney, skeletal muscle, the nervous system and other organs and tissues. Other adverse systemic effects include effects on blood chemistry, atrophy of the adrenal cortex, spleen, thymus and lymph nodes, swelling of hepatocytes (liver cells) , liver enlargement, diminished thyroid activity, hypocellularity of the marrow, bone resorption, skeletal changes and muscle wasting. The corticosteroids may also modify the ability of the body's immune system to react to diverse stimuli; this may lead to the reactivation of latent tuberculosis, enhance the effect of secondary eye infections produced by fungi or viruses or mask certain signs of infection. Hypersensitivity reactions may result. Large doses of corticosteroids may produce an excessive action on electrolyte balance, inhibit gluconeogenesis, delay wound healing and tissue repair and may inhibit the secretion of corticotrophin by the anterior lobe of the pituitary gland. Disturbances in electrolyte balance result in the retention of sodium and water, with oedema and hypertension, and the excretion of potassium with the possible development of hypokalaemic alkalosis. Cardiac failure may occur in extreme cases. The synthetic corticosteroids generally produce a lesser effect on electrolyte balance than those that occur naturally (mineralocorticoids are the exception). High blood glucose levels (hyperglycaemia), often concurrent with the presence of sugar in the urine, may also result following corticosteroid exposure. Other adverse effects produced by high doses of corticosteroids include those typical of hyperactivity of the adrenal cortex including a moon-shaped face, sometimes with hirsutism, buffalo hump, flushing, increased bruising, striae, and acne, and sometimes full-blown Cushing's syndrome. Cushing's syndrome describes redistribution of fat, often with great obesity, muscular weakness, skeletal weakness, high blood pressure and the characteristic rounded or "moon" face. Symptoms are usually reversed on withdrawal of treatment. Other adverse states include amenorrhoea,

continued...

hyperhidrosis, mental and neurological disturbance, intracranial hypertension, acute pancreatitis, and aseptic necrosis of the bone. Increases in the coagulability of the blood may result in thrombo-embolic complications. An increased susceptibility to infection arising from delayed wound healing may be masked due to the anti-inflammatory, antipyretic and analgesic properties exhibited by the corticosteroids. Patients may also exhibit increased susceptibility to other infections including sepsis, fungal and viral infection due to the immunosuppressive effects of the corticosteroids; Candida infections of the mouth, for example, are not uncommon. Corticosteroid exposure may produce psychic derangements including euphoria, insomnia, mood swings, personality changes, and severe depression to frank psychotic tendencies. Emotional instability or psychotic tendencies may be aggravated by intake. The adverse effects of corticosteroids may be exaggerated in individuals with non-specific ulcerative colitis, diverticulitis, ulcers, renal insufficiency, hypertension, osteoporosis, myasthenia gravis, hypothyroidism or cirrhosis. Prolonged exposure may produce posterior subcapsular cataracts and glaucoma, with possible damage to the optic nerve.

EYE

It has either been demonstrated or it is expected that when the material is applied to the eye(s) of animals, it produces severe ocular lesions which are present twenty-four hours or more after instillation.
The dust may produce eye discomfort causing transient smarting, blinking.
When applied to the eye corticosteroids may produce corneal ulcers, raised intraocular pressure, and reduced visual function - systemic application has produced posterior subcapsular cataract.

SKIN

Skin contact with the material may damage the health of the individual; systemic effects may result following absorption.
The material is not thought to be a skin irritant (i.e. is unlikely to produce irritant dermatitis as described in EC Directives using animal models). Temporary discomfort, however, may result from prolonged dermal exposures. Good hygiene practice requires that exposure be kept to a minimum and that suitable gloves be used in an occupational setting.
Toxic effects may result from skin absorption.
Topically applied corticosteroids may be absorbed in sufficient quantity to produce systemic effects, especially when applied under occlusive conditions or to broken skin. Application to the skin may result in collagen loss and subcutaneous atrophy and local hypopigmentation of deeply pigmented skin. A marked hypopigmentation may appear on the skin of the fingers. Sensitive individuals may experience burning, itching and dryness.
Dermal exposure to corticosteroids may produce a non-allergic dermatitis characterised by moderate to severe erythema, acne and oedema. Symptoms may appear after several days of low or no exposure; lesions may resemble "sun-burn" and peeling (exfoliation) may be present.
Systemic absorption may produce adrenal suppression and collapse as well as other symptoms consistent with corticosteroid exposure. These include a reversible hypothalmic -pituitary-adrenal (HPA) axis suppression with the potential for corticosteroid insufficiency after withdrawal of treatment, manifestations of Cushing's syndrome, hyperglycaemia and glucosuria. Dermal irritation has been noted with certain topically applied corticosteroids. Allergic contact dermatitis is usually diagnosed by observing a failure to heal rather than noting the clinical exacerbation which occurs with most topical allergens not containing corticosteroids. Such observations are corroborated with appropriate diagnostic patch testing.

continued...

INHALED

Inhalation may produce health damage*.
The material is not thought to produce respiratory irritation (as classified by EC Directives using animal models). Nevertheless inhalation, of the material, especially for prolonged periods, may produce respiratory discomfort and occasionally, distress.
Persons with impaired respiratory function, airway diseases and conditions such as emphysema or chronic bronchitis, may incur further disability if excessive concentrations of particulate are inhaled.
Systemic absorption of aerosols containing corticosteroids may produce adrenal insufficiency and collapse.

CHRONIC HEALTH EFFECTS

There exists limited evidence that shows that skin contact with the material is capable either of inducing a sensitisation reaction in a significant number of individuals, and/or of producing positive response in experimental animals.
Principal routes of exposure are by accidental skin and eye contact and inhalation of generated dusts.
Chronic exposure to corticosteroids (glucocorticoids) may produce pituitary-adrenal suppression, Cushing's syndrome (redistribution of body fat to the face -"moon-face" - and to the back of the neck and trunk), increased susceptibility to infections (through suppression of inflammatory response), osteoporosis, cataracts, glaucoma with possible damage to the optic nerve, mental symptoms, hyperglycaemia (high blood sugar) and glycosuria (glucose in the urine), muscular weakness and fatigue, acne, menstrual disorders and peptic ulcers.
Repeated intake of the corticosteroids may produce metabolic effects resulting in the mobilisation of calcium and phosphorus leading to osteoporosis, spontaneous fracture, nitrogen depletion and hyperglycaemia which may accentuate or precipitate diabetic states. Inhibition of corticotrophin secretion may produce atrophy of the adrenal cortex and, if treatment is prolonged, acute adrenal insufficiency. Growth retardation of children may also occur.
There have been reports of joint damage following intra-articular injection of corticosteroids (specifically hydrocortisone) into load-bearing joints.
Glucocorticoids have been shown to be teratogenic in laboratory studies, when administered systemically at relatively low doses; however, there are no systematic studies which demonstrate an association between congenital malformations and therapeutic use of steroid hormones. Systemically administered corticosteroids appear in human milk and may suppress growth, interfere with endogenous corticosteroid production or produce other undesirable effects.
There have been reports of joint damage following intra-articular injection of hydrocortisone acetate into load-bearing joints.
Over-exposure may also cause reproductive disorders.

TOXICITY AND IRRITATION

TOXICITY	IRRITATION
Intraperitoneal (rat) LD50: 150 mg/kg	Nil Reported
Subcutaneous (rat) LD50: 449 mg/kg	

Exposure to the material for prolonged periods may cause physical defects in the developing embryo (teratogenesis).
Retrospective studies do not indicate tetratogenic effects amongst woman undergoing corticosteroid therapy in the first trimester. [Roussel]

continued...

Section 12 - ECOLOGICAL INFORMATION

log Kow (Sangster 1997): 1.61

No data for hydrocortisone.

Section 13 - DISPOSAL CONSIDERATIONS

· Recycle wherever possible. Special hazard may exist - specialist advice may be required.
· Consult manufacturer for recycling options.
· Consult State Land Waste Management Authority for disposal.
· Bury or incinerate residue at an approved site.
· Decontaminate empty containers. Observe all label safeguards until containers are cleaned and destroyed.
· Puncture containers to prevent re-use and bury at an authorised landfill.

Section 14 - TRANSPORTATION INFORMATION

HAZCHEM: None

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

Section 15 - REGULATORY INFORMATION

REGULATIONS

No regulations applicable
No data available for hydrocortisone as CAS: 50-23-7, CAS: 8056-08-4, CAS: 8063-42-1, CAS : 80562-38-5.

Section 16 - OTHER INFORMATION

INGREDIENTS WITH MULTIPLE CAS NUMBERS

Ingredient Name	CAS
hydrocortisone	50- 23- 7, 8056- 08- 4, 8063- 42 - 1, 80562- 38- 5

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

continued...

determine the suitability of the information for their particular purpose.

Issue Date: 5-Apr-2018