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# SAFETY DATA SHEET

# SECTION 1. CHEMICAL IDENTIFICATION

CATALOG #: 41291

NAME: Tetrabutyl orthotitanate

SYNONYMS: Butyl titanate

Tetrabutoxy titan Tetrabutyl titanate Titanium butoxide

24 HOUR EMERGENCY

TELEPHONE:

(800) 535-5053(USA)

352-323-3500 (INTERNATIONAL)

TO REQUEST AN MSDS: (800) 869-9290

CUSTOMER SERVICE:

(630) 766-2112

# SECTION 2. HAZARDS IDENTIFICATION

CLASSIFICATION OF THE SUBSTANCE OR MIXTURE

GHS CLASSIFICATION IN ACCORDANCE WITH 29 CFR 1910 (OSHA HCS)

FLAMMABLE LIQUIDS (CATEGORY 3), H226 SKIN IRRITATION (CATEGORY 2), H315 SERIOUS EYE DAMAGE (CATEGORY 1), H318 SPECIFIC TARGET ORGAN TOXICITY - SINGLE EXPOSURE (CATEGORY 3), RESPIRATORY SYSTEM, CENTRAL NERVOUS SYSTEM, H335, H336

FOR THE FULL TEXT OF THE H-STATEMENTS MENTIONED IN THIS SECTION, SEE SECTION 16.

# GHS LABEL ELEMENTS, INCLUDING PRECAUTIONARY STATEMENTS

PICTOGRAM

SIGNAL WORD **DANGER** 

# **HAZARD STATEMENT(S)**

H226 FLAMMABLE LIQUID AND VAPOUR. H315 CAUSES SKIN IRRITATION. CAUSES SERIOUS EYE DAMAGE. H318 H335 MAY CAUSE RESPIRATORY IRRITATION. MAY CAUSE DROWSINESS OR DIZZINESS. H336

PRECAUTIONARY STATEMENT(S)				
P210	KEEP AWAY FROM HEAT/SPARKS/OPEN FLAMES/HOT			
	SURFACES NO SMOKING.			
P233	KEEP CONTAINER TIGHTLY CLOSED.			
P240	GROUND/BOND CONTAINER AND RECEIVING EQUIPMENT.			
P241	USE EXPLOSION-PROOF ELECTRICAL/ VENTILATING/			
	LIGHTING/ EQUIPMENT.			
P242	USE ONLY NON-SPARKING TOOLS.			
P243	TAKE PRECAUTIONARY MEASURES AGAINST STATIC			
	DISCHARGE.			
P261	AVOID BREATHING DUST/ FUME/ GAS/ MIST/ VAPOURS/			
	SPRAY.			
P264	WASH SKIN THOROUGHLY AFTER HANDLING.			
P271	USE ONLY OUTDOORS OR IN A WELL-VENTILATED AREA			
P280	WEAR PROTECTIVE GLOVES/ EYE PROTECTION/ FACE			
	PROTECTION.			
P303 + P361 + P353	IF ON SKIN (OR HAIR): REMOVE/ TAKE OFF IMMEDIATELY			
	ALL CONTAMINATED CLOTHING. RINSE SKIN WITH WATER/			
	SHOWER.			
P304 + P340 + P312	IF INHALED: REMOVE PERSON TO FRESH AIR AND KEEP			
	COMFORTABLE FOR BREATHING. CALL A POISON			
	CENTER/DOCTOR IF YOU FEEL UNWELL.			
P305 + P351 + P338 +	IF IN EYES: RINSE CAUTIOUSLY WITH WATER FOR SEVERAL			
P310	MINUTES. REMOVE CONTACT LENSES, IF PRESENT AND			
	EASY TO DO. CONTINUE RINSING. IMMEDIATELY CALL A			
	POISON CENTER/DOCTOR.			
P332 + P313	IF SKIN IRRITATION OCCURS: GET MEDICAL ADVICE/			
	ATTENTION.			
P362	TAKE OFF CONTAMINATED CLOTHING AND WASH BEFORE			
	REUSE.			
P370 + P378	IN CASE OF FIRE: USE DRY SAND, DRY CHEMICAL OR			
	ALCOHOL-RESISTANT FOAM FOR EXTINCTION.			

P403 + P233 STORE IN A WELL-VENTILATED PLACE. KEEP CONTAINER

TIGHTLY CLOSED.

P403 + P235 STORE IN A WELL-VENTILATED PLACE. KEEP COOL.

P405 STORE LOCKED UP.

P501 DISPOSE OF CONTENTS/ CONTAINER TO AN APPROVED

WASTE DISPOSAL PLANT.

HAZARDS NOT

**OTHERWISE** 

CLASSIFIED (HNOC) OR NOT COVERED

**BY GHS** 

# SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

**NONE** 

MF:  $C_{16}H_{36}O_4Ti$ 

MW: 340.33

CAS-NO. 5593-70-4

PURITY:  $\geq$  98.5% (Titanium content : 13.8 - 14.5%)

#### **HAZARDOUS COMPONENTS**

COMPONENT	CLASSIFICATION	CONCENTRATION				
Tetrabutyl orthotitanate						
	FLAM. LIQ. 3; SKIN IRRIT. 2;	>= 90 - <= 100 %				
	EYE DAM. 1; STOT SE 3; H226,					
	H315, H318, H335, H336					
TITANIUM TETRAISOPROPANOLATE						
	FLAM. LIQ. 3; EYE IRRIT. 2A;	>= 5 - < 10 %				
	STOT SE 3; H226, H319, H336					
N-BUTANOL						
	FLAM. LIQ. 3; ACUTE TOX. 4;	>= 1 - < 5 %				
	SKIN IRRIT. 2; EYE DAM. 1;					
	STOT SE 3; H226, H302, H315,					
	H318, H335, H336					
	CONCENTRATION LIMITS: >=					
	20 %: STOT SE 3, H335; >= 20 %:					
	STOT SE 3, H336;					

FOR THE FULL TEXT OF THE H-STATEMENTS MENTIONED IN THIS SECTION, SEE SECTION 16.

# **SECTION 4. FIRST-AID MEASURES**

**GENERAL ADVICE** SHOW THIS MATERIAL SAFETY DATA SHEET TO THE

DOCTOR IN ATTENDANCE.

**IF INHALED** AFTER INHALATION: FRESH AIR. CALL IN PHYSICIAN.

IN CASE OF SKIN CONTACT

IN CASE OF SKIN CONTACT: TAKE OFF IMMEDIATELY ALL CONTAMINATED CLOTHING. RINSE SKIN WITH

WATER/ SHOWER.

IN CASE OF EYE CONTACT

AFTER EYE CONTACT: RINSE OUT WITH PLENTY OF WATER. IMMEDIATELY CALL IN OPHTHALMOLOGIST.

REMOVE CONTACT LENSES.

IF SWALLOWED AFTER SWALLOWING: IMMEDIATELY MAKE VICTIM

DRINK WATER (TWO GLASSES AT MOST). CONSULT A

PHYSICIAN.

MOST IMPORTANT SYMPTOMS AND EFFECTS, BOTH ACUTE

AND DELAYED

THE MOST IMPORTANT KNOWN SYMPTOMS AND EFFECTS ARE DESCRIBED IN THE LABELLING (SEE

SECTION 2.2) AND/OR IN SECTION 11

INDICATION OF ANY IMMEDIATE MEDICAL ATTENTION AND SPECIAL TREATMENT NEEDED NO DATA AVAILABLE

#### SECTION 5. FIRE AND EXPLOSION DATA

# **EXTINGUISHING MEDIA**

SUITABLE SUITABLE EXTINGUISHING MEDIA

EXTINGUISHING MEDIA WATER FOAM CARBON DIOXIDE (CO2) DRY POWDER

UNSUITABLE EXTINGUISHING MEDIA

FOR THIS SUBSTANCE/MIXTURE NO LIMITATIONS OF

EXTINGUISHING AGENTS ARE GIVEN.

SPECIAL HAZARDS CARBON OXIDES, TITANIUM/TITANIUM OXIDES

ARISING FROM THE COMBUSTIBLE.

SUBSTANCE OR MIXTURE VAPORS ARE HEAVIER THAN AIR AND MAY SPREAD

ALONG FLOORS.

FORMS EXPLOSIVE MIXTURES WITH AIR AT ELEVATED

TEMPERATURES.

DEVELOPMENT OF HAZARDOUS COMBUSTION GASES

OR VAPOURS POSSIBLE IN THE EVENT OF FIRE.

ADVICE FOR STAY IN DANGER AREA ONLY WITH SELF-CONTAINED BREATHING APPARATUS. PREVENT SKIN CONTACT BY

KEEPING A SAFE DISTANCE OR BY WEARING SUITABLE PROTECTIVE CLOTHING.

SUITABLE PROTECTIVE CLOTHING.

FURTHER INFORMATION REMOVE CONTAINER FROM DANGER ZONE AND

COOL WITH WATER. PREVENT FIRE EXTINGUISHING WATER FROM CONTAMINATING SURFACE WATER OR

THE GROUND WATER SYSTEM.

# SECTION 6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS, PROTECTIVE EQUIPMENT AND EMERGENCY PROCEDURES ADVICE FOR NON-EMERGENCY PERSONNEL: DO NOT BREATHE VAPORS, AEROSOLS. AVOID SUBSTANCE CONTACT. ENSURE ADEQUATE VENTILATION. KEEP AWAY FROM HEAT AND SOURCES OF IGNITION. EVACUATE THE DANGER AREA, OBSERVE

EMERGENCY PROCEDURES, CONSULT AN EXPERT. FOR PERSONAL PROTECTION SEE SECTION 8.

ENVIRONMENTAL PRECAUTIONS

DO NOT LET PRODUCT ENTER DRAINS. RISK OF

EXPLOSION.

METHODS AND MATERIALS FOR CONTAINMENT AND CLEANING UP COVER DRAINS. COLLECT, BIND, AND PUMP OFF SPILLS. OBSERVE POSSIBLE MATERIAL RESTRICTIONS (SEE SECTIONS 7 AND 10). TAKE UP WITH LIQUID-ABSORBENT MATERIAL. DISPOSE OF PROPERLY.

CLEAN UP AFFECTED AREA.

REFERENCE TO OTHER SECTIONS

FOR DISPOSAL SEE SECTION 13.

#### SECTION 7. HANDLING AND STORAGE

PRECAUTIONS FOR SAFE HANDLING

AVOID GENERATION OF VAPOURS/AEROSOLS.

KEEP AWAY FROM OPEN FLAMES, HOT SURFACES AND SOURCES OF IGNITION.TAKE PRECAUTIONARY

MEASURES AGAINST STATIC DISCHARGE. FOR PRECAUTIONS SEE SECTION 2.2.

CONDITIONS FOR SAFE STORAGE, INCLUDING ANY INCOMPATIBILITIES

KEEP CONTAINER TIGHTLY CLOSED IN A DRY AND WELL-VENTILATED PLACE. KEEP AWAY FROM HEAT

AND SOURCES OF IGNITION.

AIR AND MOISTURE SENSITIVE.

Store at RT

# SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

# CONTROL PARAMETERS

# COMPONENTS WITH WORKPLACE CONTROL PARAMETERS

COMPONENT	CAS-NO.	VALUE	CONTROL	BASIS
			PARAMETERS	
N-BUTANOL	71-36-3	TWA	20 PPM	USA. ACGIH THRESHOLD
				LIMIT VALUES (TLV)
		С	50 PPM	USA. NIOSH
			150 MG/M3	RECOMMENDED EXPOSURE
				LIMITS
	REMARKS	POTENTIAL FOR DERMAL ABSORPTION		
		TWA	100 PPM	USA. OCCUPATIONAL
			300 MG/M3	EXPOSURE LIMITS (OSHA) -
				TABLE Z-1 LIMITS FOR AIR
				CONTAMINANTS
		С	50 PPM	CALIFORNIA PERMISSIBLE
			150 MG/M3	EXPOSURE LIMITS FOR
				CHEMICAL CONTAMINANTS
		SKIN		
		С	50 PPM	USA. OSHA - TABLE Z-1
			150 MG/M3	LIMITS FOR AIR
				CONTAMINANTS - 1910.1000
		SKIN NOTATION		

# **EXPOSURE CONTROLS**

APPROPRIATE ENGINEERING CONTROLS

IMMEDIATELY CHANGE CONTAMINATED CLOTHING. APPLY PREVENTIVE SKIN PROTECTION. WASH HANDS AND FACE AFTER WORKING WITH SUBSTANCE.

# PERSONAL PROTECTIVE EQUIPMENT

**EYE/FACE PROTECTION** 

USE EQUIPMENT FOR EYE PROTECTION TESTED AND APPROVED UNDER APPROPRIATE GOVERNMENT STANDARDS SUCH AS NIOSH (US) OR EN 166(EU). TIGHTLY FITTING SAFETY GOGGLES

# **SKIN PROTECTION**

THIS RECOMMENDATION APPLIES ONLY TO THE PRODUCT STATED IN THE SAFETY DATA SHEET, SUPPLIED BY US AND FOR THE DESIGNATED USE. WHEN DISSOLVING IN OR MIXING WITH OTHER SUBSTANCES AND UNDER CONDITIONS DEVIATING FROM THOSE STATED IN EN374 PLEASE CONTACT THE SUPPLIER OF CE-APPROVED GLOVES

FULL CONTACT

MATERIAL: BUTYL-RUBBER

MINIMUM LAYER THICKNESS: 0.7 MM BREAK THROUGH TIME: 480 MIN MATERIAL TESTED:KCL 898

THIS RECOMMENDATION APPLIES ONLY TO THE PRODUCT STATED IN THE SAFETY DATA SHEET, SUPPLIED BY US AND FOR THE DESIGNATED USE. WHEN DISSOLVING IN OR MIXING WITH OTHER SUBSTANCES AND UNDER CONDITIONS DEVIATING FROM THOSE STATED IN EN374 PLEASE CONTACT THE SUPPLIER OF CE-APPROVED GLOVES

SPLASH CONTACT

MATERIAL: NITRILE RUBBER

MINIMUM LAYER THICKNESS: 0.4 MM

BREAK THROUGH TIME: 30 MIN

MATERIAL TESTED: CAMATRIL (KCL 730, SIZE M)

**BODY PROTECTION** 

FLAME RETARDANT ANTISTATIC PROTECTIVE

CLOTHING.

RESPIRATORY PROTECTION

REQUIRED WHEN VAPOURS/AEROSOLS ARE

GENERATED.

OUR RECOMMENDATIONS ON FILTERING RESPIRATORY

PROTECTION ARE BASED ON THE FOLLOWING STANDARDS; DIN EN 143, DIN 14387 AND OTHER

ACCOMPANYING STANDARDS RELATING TO THE USED

RESPIRATORY PROTECTION SYSTEM.

CONTROL OF ENVIRONMENTAL EXPOSURE DO NOT LET PRODUCT ENTER DRAINS. RISK OF

EXPLOSION.

# SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

# INFORMATION ON BASIC PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE Colorless to yellow clear liquid

ODOUR NO DATA AVAILABLE
ODOUR THRESHOLD NO DATA AVAILABLE
PH NO DATA AVAILABLE

MELTING -40 °C (Lit.)

POINT/FREEZING POINT

INITIAL BOILING POINT 185 °C / 10 mmHg (Lit.)

AND BOILING RANGE

FLASH POINT 46 °C

**EVAPORATION RATE** NO DATA AVAILABLE FLAMMABILITY (SOLID, NO DATA AVAILABLE

UPPER/LOWER NO DATA AVAILABLE

FLAMMABILITY OR EXPLOSIVE LIMITS

VAPOUR PRESSURE NO DATA AVAILABLE VAPOUR DENSITY NO DATA AVAILABLE

RELATIVE DENSITY 1.00 g/mL

WATER SOLUBILITY NO DATA AVAILABLE NO DATA AVAILABLE PARTITION COEFFICIENT:

N- OCTANOL/WATER

**AUTO-IGNITION** NO DATA AVAILABLE

TEMPERATURE

NO DATA AVAILABLE DECOMPOSITION

TEMPERATURE

VISCOSITY NO DATA AVAILABLE **EXPLOSIVE PROPERTIES** NO DATA AVAILABLE OXIDIZING PROPERTIES NO DATA AVAILABLE

# OTHER SAFETY INFORMATION

NO DATA AVAILABLE

#### STABILITY AND REACTIVITY SECTION 10.

REACTIVITY VAPOR/AIR-MIXTURES ARE EXPLOSIVE AT INTENSE

WARMING.

**CHEMICAL STABILITY** STABLE UNDER RECOMMENDED STORAGE

CONDITIONS.

**POSSIBILITY OF HAZARDOUS** REACTIONS

NO DATA AVAILABLE

CONDITIONS TO AVOID HEATING.

**INCOMPATIBLE** BASES, OXIDIZING AGENTS, ALKALI METALS, STRONG **MATERIALS** 

OXIDIZING AGENTS, STRONG ACIDS AND OXIDIZING

AGENTS, STRONG ACIDS, HALOGENS

HAZARDOUS DECOMPOSITION PRODUCTS HAZARDOUS DECOMPOSITION PRODUCTS FORMED

UNDER FIRE CONDITIONS. - CARBON OXIDES,

TITANIUM/TITANIUM OXIDES

OTHER DECOMPOSITION PRODUCTS - NO DATA

**AVAILABLE** 

IN THE EVENT OF FIRE: SEE SECTION 5

# SECTION 11. TOXICOLOGICAL INFORMATION

#### INFORMATION ON TOXICOLOGICAL EFFECTS

ACUTE TOXICITY NO DATA AVAILABLE

INHALATION: NO DATA AVAILABLE

DERMAL: NO DATA AVAILABLE

NO DATA AVAILABLE

**SKIN** MIXTURE CAUSES SKIN IRRITATION.

**CORROSION/IRRITATION** 

SERIOUS EYE DAMAGE/EYE IRRITATION

EYE MIXTURE CAUSES SERIOUS EYE DAMAGE.

RESPIRATORY OR SKIN SENSITISATION

NO DATA AVAILABLE

GERM CELL MUTAGENICITY NO DATA AVAILABLE

**CARCINOGENICITY** 

IARC: NO INGREDIENT OF THIS PRODUCT PRESENT AT

LEVELS GREATER THAN OR EQUAL TO 0.1% IS

IDENTIFIED AS PROBABLE, POSSIBLE OR CONFIRMED

HUMAN CARCINOGEN BY IARC.

NTP: NO INGREDIENT OF THIS PRODUCT PRESENT AT

LEVELS GREATER THAN OR EQUAL TO 0.1% IS IDENTIFIED AS A KNOWN OR ANTICIPATED

CARCINOGEN BY NTP.

OSHA: NO COMPONENT OF THIS PRODUCT PRESENT AT

LEVELS GREATER THAN OR EQUAL TO 0.1% IS ON OSHA'S LIST OF REGULATED CARCINOGENS.

REPRODUCTIVE TOXICITY NO DATA AVAILABLE

SPECIFIC TARGET ORGAN TOXICITY - SINGLE EXPOSURE MIXTURE MAY CAUSE RESPIRATORY IRRITATION. MIXTURE MAY CAUSE DROWSINESS OR DIZZINESS. ACUTE ORAL TOXICITY - IRRITATIONS OF MUCOUS

MEMBRANES IN THE MOUTH, PHARYNX,

OESOPHAGUS AND GASTROINTESTINAL TRACT. ACUTE INHALATION TOXICITY - POSSIBLE SYMPTOMS:, MUCOSAL IRRITATIONS, COUGH, SHORTNESS OF BREATH, POSSIBLE DAMAGES:,

DAMAGE OF RESPIRATORY TRACT

SPECIFIC TARGET ORGAN TOXICITY - REPEATED

EXPOSURE

NO DATA AVAILABLE

**ASPIRATION HAZARD** NO DATA AVAILABLE

ADDITIONAL INFORMATION

RTECS: XR1585000

TO THE BEST OF OUR KNOWLEDGE, THE CHEMICAL, PHYSICAL, AND

TOXICOLOGICAL PROPERTIES HAVE NOT BEEN THOROUGHLY INVESTIGATED.

OTHER DANGEROUS PROPERTIES CAN NOT BE EXCLUDED.

HANDLE IN ACCORDANCE WITH GOOD INDUSTRIAL HYGIENE AND SAFETY

PRACTICE.

STOMACH - IRREGULARITIES - BASED ON HUMAN EVIDENCE

# SECTION 12. ECOLOGICAL INFORMATION

**TOXICITY** NO DATA AVAILABLE

PERSISTENCE AND DEGRADABILITY

NO DATA AVAILABLE

BIOACCUMULATIVE

POTENTIAL

NO DATA AVAILABLE

MOBILITY IN SOIL NO DATA AVAILABLE

RESULTS OF PBT AND VPVB ASSESSMENT

PBT/VPVB ASSESSMENT NOT AVAILABLE AS

CHEMICAL SAFETY ASSESSMENT NOT

REQUIRED/NOT CONDUCTED

OTHER ADVERSE EFFECTS NO DATA AVAILABLE

# SECTION 13. DISPOSAL CONSIDERATIONS

# WASTE TREATMENT METHODS

**PRODUCT** WASTE MATERIAL MUST BE DISPOSED OF IN

ACCORDANCE WITH THE NATIONAL AND LOC NO MIXING WITH OTHER WASTE. HANDLE UNCLEANED CONTAINERS FOR PROCESSES REGARDING THE RETURN OF CHEMICALS AND CONTAINERS, OR CONTACT US THERE IF YOU HAVE FURTHER

QUESTIONS.

CONTAMINATED PACKAGING

DISPOSE OF AS UNUSED PRODUCT.

# **SECTION 14.** TRANSPORT INFORMATION

DOT (US)

PROPER SHIPPING NAME: FLAMMABLE LIQUIDS, N.O.S. (Tetrabutyl orthotitanate)

UN NUMBER: 1993
CLASS: 3
PACKING GROUP: III
REPORTABLE QUANTITY 100 LBS

(RQ):

POISON INHALATION NO

HAZARD:

**IMDG** 

PROPER SHIPPING NAME: FLAMMABLE LIQUIDS, N.O.S. (Tetrabutyl orthotitanate)

UN NUMBER: 1993 CLASS: 3 PACKING GROUP: III EMS-NO: F-E, S-E

**IATA** 

PROPER SHIPPING NAME: FLAMMABLE LIQUIDS, N.O.S. (Tetrabutyl orthotitanate)

UN NUMBER: 1993 CLASS: 3 PACKING GROUP: III

#### SECTION 15. REGULATORY INFORMATION

SARA 302 COMPONENTS THIS MATERIAL DOES NOT CONTAIN ANY

COMPONENTS WITH A SECTION 302 EHS TPQ.

**SARA 313 COMPONENTS** THE FOLLOWING COMPONENTS ARE SUBJECT TO

REPORTING LEVELS ESTABLISHED BY SARA TITLE III,

SECTION 313:

CAS-NO. REVISION DATE

N-BUTANOL 71-36-3 07/01/2007

SARA 311/312 HAZARDS FIRE HAZARD, ACUTE HEALTH HAZARD, CHRONIC

HEALTH HAZARD

#### MASSACHUSETTS RIGHT TO KNOW COMPONENTS

NO COMPONENTS ARE SUBJECT TO THE MASSACHUSETTS RIGHT TO KNOW ACT.

#### SECTION 16. OTHER INFORMATION

# FULL TEXT OF H-STATEMENTS REFERRED TO UNDER SECTIONS 2 AND 3.

H226 FLAMMABLE LIQUID AND VAPOUR.

H315 CAUSES SKIN IRRITATION.

H318 CAUSES SERIOUS EYE DAMAGE.

H335 MAY CAUSE RESPIRATORY IRRITATION. H336 MAY CAUSE DROWSINESS OR DIZZINESS.

MSDS LEGEND

MW: MOLECULAR WEIGHT
MF: MOLECULAR FORMULA

VOC: VOLATILE ORGANIC COMPOUNDS

ACGIH: AMERICAN CONFERENCE OF GOVERNMENENTAL

INDUSTRIAL HYGINISTS

CAS: CHEMICAL ABSTRACTS SERIVE REGISTRY NUMBER

OSHA: OCCUPATIONAL SAFETY AND HEALTH

**ADMINISTRATION** 

PEL: PERMISSIBLE EXPOSURE LIMIT (OSHA) TLV: THRESHOLD LIMIT VALUE (ACGIH)

IMPORTANT:

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VERSION: 3.1. REVISION DATE: 01/27/2017