

Experiment Number: 05083-01

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: Rat/F 344/N

**P18: INCIDENCE RATES OF NON-NEOPLASTIC LESIONS BY ANATOMIC SITE (a) WITH
AVERAGE SEVERITY GRADES[b]**

Test Compound: Wollastonite calcium silicates

CAS Number: 13983-17-0

Date Report Requested: 10/23/2014

Time Report Requested: 12:31:15

First Dose M/F: NA / NA

Lab: NORTHROP

C Number:	C55470B
Lock Date:	Not Entered.
Cage Range:	All
Date Range:	All
Reasons For Removal:	All
Removal Date Range:	All
Treatment Groups:	All
Study Gender:	Male
PWG Approval Date	NONE

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First Dose M/F: NA / NA

Lab: NORTHROP

F 344/N Rat MALE	CONTROL	10 MG/M3 24 MO	10 MG/M3 12 MO	10 MG/M3ASBESTOS
Disposition Summary				
Animals Initially In Study	78	78	78	78
Early Deaths				
Dead	53	19	49	45
Interval Sacrifice	12	12	12	12
Moribund	6	31	6	7
Survivors				
Terminal Sacrifice	7	12	11	13
Missing		4		
Wrong Sex				1
Animals Examined Microscopically	68	78	67	67
ALIMENTARY SYSTEM				
Esophagus	(61)	(63)	(60)	(56)
Hyperkeratosis			1 [2.0]	
Hyperplasia			1 [2.0]	
Intestine Large	(0)	(1)	(0)	(0)
Intestine Large, Cecum	(58)	(57)	(51)	(53)
Submucosa, Necrosis, Acute, Focal		1 [2.0]		
Intestine Large, Colon	(58)	(54)	(52)	(54)
Mucosa, Submucosa, Inflammation				1 [4.0]
Necrosis			1 [2.0]	
Ulcer, Focal		1 [1.0]	1 [2.0]	
Intestine Large, Rectum	(60)	(58)	(53)	(56)
Intestine Small	(0)	(1)	(0)	(0)
Intestine Small, Duodenum	(60)	(58)	(55)	(56)
Inflammation			1 [2.0]	
Necrosis, Acute	1 [2.0]			
Ulcer			1 [2.0]	

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Intestine Small, Ileum	(60)	(54)	(52)	(55)
Hyperplasia, Focal			1 [2.0]	
Mucosa, Dilatation			1 [2.0]	
Intestine Small, Jejunum	(60)	(55)	(53)	(53)
Lymphoid Tiss, Hyperplasia			1 [2.0]	
Liver	(68)	(69)	(63)	(63)
Basophilic Focus		2 [2.0]		
Bile Duct, Hyperplasia	49 [2.7]	53 [2.4]	13 [2.9]	30 [2.3]
Bile Duct, Inflammation				1 [2.0]
Bile Duct, Proliferation				2 [2.5]
Bile Stasis	1 [3.0]	1 [1.0]		
Central Vein, Thrombosis			1	
Centrilobular, Necrosis	2 [2.5]			3 [3.0]
Clear Cell Focus				1
Degeneration			17 [2.1]	
Degeneration, Cystic	8 [2.0]	4 [1.8]	1 [3.0]	9 [2.0]
Degeneration, Cystic, Focal		1 [2.0]		1 [2.0]
Focal Cellular Change	2 [2.0]			
Granuloma, Focal	1 [2.0]			
Hepatocyte, Hyperplasia	1 [2.0]			
Hepatocyte, Hypertrophy			1 [4.0]	
Hepatocyte, Necrosis, Acute, Focal		1 [2.0]		
Hepatocyte, Necrosis, Focal		1 [1.0]		
Hepatocyte, Vacuolization Cytoplasmic	1 [2.0]	2 [2.5]	1 [3.0]	4 [2.3]
Hepatocyte, Vacuolization Cytoplasmic, Diffuse	1 [3.0]		1 [4.0]	
Hepatodiaphragmatic Nodule		2		5
Hyperplasia			16 [3.1]	
Inflammation			1 [1.0]	

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Necrosis	1 [3.0]	1 [3.0]	2 [4.0]	
Necrosis, Coagulative, Focal		1 [2.0]		
Necrosis, Focal	2 [2.0]	1 [1.0]		3 [2.0]
Necrosis, Multifocal		1 [2.0]		1 [2.0]
Periportal, Necrosis		1 [2.0]		
Vacuolization Cytoplasmic		1 [2.0]		
Vein, Thrombosis				1
Mesentery	(1)	(1)	(0)	(0)
Fat, Necrosis, Acute		1 [3.0]		
Pancreas	(58)	(60)	(58)	(54)
Acinus, Atrophy				6 [2.3]
Acinus, Atrophy, Focal				2 [2.0]
Acinus, Fibrosis, Focal	1 [2.0]	1 [1.0]		
Acinus, Hyperplasia	1 [2.0]		1 [2.0]	4 [2.0]
Artery, Polyarteritis	1 [2.0]			
Atrophy	4 [2.3]	7 [2.1]	11 [2.2]	
Atrophy, Focal			1 [2.0]	
Duct, Inflammation, Chronic		1 [2.0]		
Fat, Necrosis			1 [3.0]	
Fibrosis	5 [2.4]	10 [2.3]	1 [2.0]	
Fibrosis, Focal		3 [1.3]		1 [2.0]
Hyperplasia			10 [2.2]	
Perivascular, Inflammation, Chronic	1 [2.0]			
Pigmentation, Hemosiderin	1 [3.0]			
Polyarteritis	1 [2.0]			
Salivary Glands	(55)	(58)	(51)	(47)
Duct, Metaplasia, Squamous	6 [2.0]	6 [1.7]		
Stomach	(1)	(0)	(0)	(0)
Submucosa, Mineralization	1 [2.0]			

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Stomach, Forestomach	(62)	(61)	(63)	(63)
Acanthosis		1 [2.0]		
Acanthosis, Focal	1 [3.0]			
Edema		1 [2.0]		
Epithelium, Hyperplasia		1 [3.0]		1 [2.0]
Erosion			2 [2.5]	
Hyperkeratosis		5 [3.0]	2 [2.5]	
Hyperplasia			2 [2.0]	
Inflammation			1 [2.0]	
Inflammation, Acute		1 [3.0]	1 [2.0]	
Mucosa, Ulcer				1 [2.0]
Submucosa, Inflammation				5 [2.0]
Submucosa, Inflammation, Acute		2 [3.0]		
Submucosa, Mineralization				3 [3.3]
Ulcer	5 [2.2]	3 [2.3]	2 [2.0]	
Ulcer, Focal		1 [2.0]		7 [2.0]
Stomach, Glandular	(61)	(62)	(60)	(61)
Mineralization	3 [3.0]			1 [2.0]
Mucosa, Mineralization			4 [3.0]	
Necrosis, Focal				1 [2.0]
Submucosa, Inflammation, Chronic Active		1 [3.0]		
Submucosa, Mineralization				3 [3.3]
Tongue	(1)	(0)	(4)	(0)
Hyperplasia			1 [2.0]	
Necrosis	1 [2.0]			
CARDIOVASCULAR SYSTEM				
Heart	(63)	(66)	(63)	(60)
Atrium Lft, Valve, Thrombosis		1		

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Atrium, Mineralization	1 [2.0]			
Atrium, Thrombosis	7	3 [2.0]	8 [1.5]	7
Cardiomyopathy	56 [2.6]	62 [2.5]	60 [2.6]	55 [2.7]
Inflammation			1 [3.0]	
Mineralization	4 [2.5]		1 [2.0]	3 [3.3]
ENDOCRINE SYSTEM				
Adrenal Gland	(2)	(0)	(0)	(0)
Adrenal Gland, Cortex	(67)	(65)	(63)	(63)
Degeneration		1 [2.0]		
Degeneration, Cystic, Focal		1 [1.0]		
Hyperplasia		1 [2.0]	2 [2.0]	
Hyperplasia, Focal	1 [2.0]	1 [2.0]		1 [2.0]
Vacuolization Cytoplasmic	19 [2.2]	29 [1.7]	16 [2.2]	14 [2.1]
Zona Reticul, Necrosis		1 [3.0]		
Adrenal Gland, Medulla	(67)	(61)	(60)	(61)
Cyst, Multiple		1		
Hyperplasia	6 [2.0]	4 [1.8]	16 [2.1]	18 [2.0]
Mineralization			1 [2.0]	
Necrosis	1 [2.0]			1 [2.0]
Islets, Pancreatic	(7)	(13)	(8)	(8)
Hyperplasia	2 [1.5]	2 [2.0]	2 [2.0]	
Parathyroid Gland	(54)	(55)	(52)	(50)
Bilateral, Hyperplasia				3 [2.0]
Hyperplasia	1 [2.0]	1 [2.0]	7 [2.9]	10 [2.0]
Pituitary Gland	(50)	(53)	(56)	(51)
Angiectasis			1 [2.0]	
Cyst, Multiple		2 [1.0]	1	
Hyperplasia	10 [2.0]	7 [2.0]	9 [2.4]	6 [2.0]

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Pars Distalis, Cyst			1	
Pars Intermed, Hyperplasia			1 [2.0]	
Thyroid Gland	(56)	(56)	(52)	(50)
C Cell, Hyperplasia	2 [2.0]			1 [2.0]
Cyst			1 [1.0]	
Cyst, Multiple		3 [1.5]	4	
GENERAL BODY SYSTEM				
Tissue NOS	(7)	(9)	(7)	(3)
Abscess			1 [3.0]	
Fat, Necrosis				1 [2.0]
Fat, Necrosis, Acute		1 [2.0]		
Granuloma			1 [2.0]	
Inflammation			1 [4.0]	
Inflammation, Acute	1 [2.0]			
Necrosis	2 [2.0]			1 [2.0]
Thrombosis	1			
GENITAL SYSTEM				
Epididymis	(67)	(67)	(65)	(65)
Degeneration			1 [3.0]	
Hypospermia	29 [2.0]	16 [2.3]	25 [4.0]	25 [2.0]
Necrosis			1 [4.0]	1 [2.0]
Penis	(0)	(2)	(1)	(0)
Preputial Gland	(45)	(31)	(45)	(43)
Hyperplasia				1 [2.0]
Inflammation			1 [2.0]	
Inflammation, Acute				3 [2.3]
Prostate	(62)	(64)	(62)	(65)
Epithelium, Metaplasia, Squamous	1 [2.0]			

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Hemorrhage		2 [2.0]		
Hyperplasia		1 [2.0]		
Hyperplasia, Focal	1 [2.0]	1 [2.0]	1 [3.0]	2 [2.0]
Inflammation			11 [2.8]	
Inflammation, Acute	5 [2.4]	6 [2.3]		8 [2.1]
Inflammation, Acute, Diffuse		1 [4.0]		
Inflammation, Acute, Focal				1 [2.0]
Inflammation, Chronic	2 [2.0]	1 [2.0]		1 [2.0]
Inflammation, Chronic Active	1 [3.0]	3 [2.7]		
Seminal Vesicle	(66)	(59)	(61)	(64)
Inflammation			1 [2.0]	
Inflammation, Acute	3 [2.0]			3 [2.0]
Inflammation, Chronic Active	1 [4.0]			
Testes	(66)	(65)	(65)	(64)
Atrophy	1 [4.0]	2 [3.5]	2 [3.5]	
Atrophy, Diffuse	1 [4.0]			
Degeneration	13 [2.1]	3 [2.7]		12 [2.0]
Hyperplasia			4 [2.0]	
Hypospermia	1 [2.0]			
Interstit Cell, Hyperplasia	1 [2.0]			1 [2.0]
Mineralization				1 [2.0]
Polyarteritis	1 [2.0]			
Seminif Tub, Degeneration	1 [2.0]			
HEMATOPOIETIC SYSTEM				
Bone Marrow	(66)	(44)	(59)	(64)
Fibrous Osteodystrophy				1
Hypercellularity		3 [2.3]	14 [3.0]	
Hyperplasia	9 [2.0]		1 [2.0]	1 [2.0]

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Hypocellularity			1 [3.0]	
Necrosis	1 [3.0]			
Lymph Node	(60)	(57)	(56)	(51)
Bronchial, Angiectasis			2 [3.5]	
Bronchial, Depletion Cellular	1 [2.0]			
Bronchial, Ectasia			2 [2.5]	1 [2.0]
Bronchial, Hemorrhage				1 [2.0]
Bronchial, Hyperplasia			2 [2.0]	
Congestion			1 [2.0]	
Ectasia			1 [3.0]	
Pancreatic, Hyperplasia				1 [2.0]
Pancreatic, Mineralization			1 [3.0]	
Pancreatic, Pigmentation	1 [2.0]			
Lymph Node, Mandibular	(52)	(64)	(52)	(45)
Bronchial, Ectasia			1 [2.0]	
Congestion	1 [2.0]			
Hyperplasia		2 [2.0]	6 [1.8]	2 [2.0]
Mesenteric, Hyperplasia			3 [2.0]	
Necrosis			1 [3.0]	
Lymph Node, Mesenteric	(54)	(27)	(48)	(43)
Congestion			1 [2.0]	
Ectasia			3 [2.7]	1 [2.0]
Hemorrhage				2 [2.0]
Hyperplasia		1 [2.0]	1 [2.0]	1 [2.0]
Spleen	(67)	(67)	(64)	(65)
Ectasia			1 [3.0]	
Fibrosis	2 [2.0]	2 [2.0]	1 [3.0]	
Fibrosis, Focal		1 [2.0]		
Infarct	1 [2.0]			

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Necrosis	1 [4.0]			1 [2.0]
Thymus	(46)	(37)	(36)	(35)
Atrophy			2 [3.5]	
Cyst, Multiple		2 [2.0]		
Necrosis				1 [2.0]
INTEGUMENTARY SYSTEM				
Mammary Gland	(29)	(29)	(36)	(22)
Cyst	6	2 [2.0]	1	11
Cyst, Multiple		2 [1.0]	2	
Hemorrhage			1 [3.0]	
Hyperplasia	1 [2.0]			
Hyperplasia, Cystic		1 [2.0]		
Inflammation			1 [4.0]	
Skin	(56)	(66)	(55)	(59)
Acanthosis, Focal				1 [2.0]
Cyst Epithelial Inclusion		1	1 [3.0]	1
Dermis, Tail, Cyst, Multiple		1		
Dermis, Tail, Inflammation, Acute		1 [2.0]		
Epidermis, Cyst			2	
Epidermis, Tail, Cyst, Multiple		1		
Hair Follicle, Atrophy		1 [2.0]		
Hyperkeratosis			1 [1.0]	
Parakeratosis	1 [3.0]		1 [3.0]	
Sebaceous Gland, Hyperplasia		1 [3.0]		
Tail, Cyst Dermoid		1		
Tail, Cyst Epithelial Inclusion, Multiple		1		
Tail, Hyperkeratosis	2 [2.0]	2 [2.5]		
Tail, Necrosis, Acute	1 [4.0]			

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Tail, Ulcer	2 [3.0]			
Ulcer			1 [1.0]	
MUSCULOSKELETAL SYSTEM				
Bone	(67)	(67)	(61)	(64)
Fibrous Osteodystrophy	2			
Fibrous Osteodystrophy, Focal				1
Hypertrophy			1 [3.0]	
Skeletal Muscle	(48)	(56)	(55)	(56)
Degeneration				1 [2.0]
Necrosis				1 [2.0]
NERVOUS SYSTEM				
Brain	(66)	(68)	(61)	(63)
Gliosis, Focal		1 [2.0]		
Hemorrhage				1 [3.0]
Inflammation			1 [4.0]	
Medulla, Hemorrhage		1 [2.0]		
Necrosis, Focal	1 [2.0]			
Necrosis, Multifocal				1 [2.0]
Brain, Brain Stem	(1)	(0)	(0)	(0)
Brain, Cerebrum	(0)	(1)	(0)	(0)
RESPIRATORY SYSTEM				
Larynx	(52)	(55)	(50)	(53)
Foreign Body		1 [2.0]		
Inflammation			1 [2.0]	
Inflammation, Acute	1 [2.0]	2 [1.5]		
Metaplasia, Squamous		1 [2.0]		
Lung	(56)	(54)	(54)	(54)

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Alveolar Epith, Bronchiole, Hyperplasia	3 [2.3]			30 [2.2]
Alveolar Epith, Hyperplasia	1 [2.0]			1 [3.0]
Alveolar Epith, Hyperplasia, Focal			1 [2.0]	
Alveolar Epith, Necrosis, Acute	1 [3.0]			
Alveolus, Bronchiole, Hyperplasia, Focal			1 [2.0]	
Alveolus, Hemorrhage, Multifocal		1 [2.0]		
Alveolus, Hyperplasia			2 [1.5]	
Alveolus, Hyperplasia, Focal			1 [2.0]	
Alveolus, Inflammation, Acute	1 [3.0]			
Alveolus, Mineralization				2 [2.5]
Atelectasis, Focal		1 [2.0]	1 [2.0]	
Bronchus, Epithelium, Hyperplasia, Focal				1 [3.0]
Emphysema			1 [3.0]	
Fibrosis	1 [2.0]		4 [2.0]	
Fibrosis, Focal	2 [2.0]			
Hyperplasia			5 [2.0]	
Hyperplasia, Focal	1 [2.0]			
Inflammation			1 [2.0]	
Inflammation, Chronic, Focal		1 [2.0]		
Inflammation, Granulomatous, Focal		1 [2.0]		
Inflammation, Suppurative, Acute				1 [3.0]
Interstitial, Fibrosis		1 [1.0]		50 [2.5]
Interstitial, Fibrosis, Focal		2 [1.0]	1 [1.0]	
Interstitial, Fibrosis, Multifocal			1 [2.0]	
Interstitial, Hyperplasia			1 [2.0]	
Interstitial, Mineralization			1 [2.0]	1 [2.0]
Metaplasia, Osseous		1 [1.0]		
Metaplasia, Osseous, Focal				1 [2.0]
Mineralization	1 [2.0]			2 [2.5]

a - Number of animals examined microscopically at site and number of animals with lesion

b - Average severity grade (1-minimal; 2-mild; 3-moderate; 4-marked)

Experiment Number: 05083-01

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: Rat/F 344/N

**P18: INCIDENCE RATES OF NON-NEOPLASTIC LESIONS BY ANATOMIC SITE (a) WITH
AVERAGE SEVERITY GRADES[b]**

Test Compound: Wollastonite calcium silicates

CAS Number: 13983-17-0

Date Report Requested: 10/23/2014

Time Report Requested: 12:31:16

First Dose M/F: NA / NA

Lab: NORTHROP

F 344/N Rat MALE	CONTROL	10 MG/M3 24 MO	10 MG/M3 12 MO	10 MG/M3ASBESTOS
Peribronchiolr, Inflammation, Chronic Active		1 [2.0]		
Venule, Mineralization, Focal	1 [2.0]			
Nose	(63)	(63)	(60)	(58)
Foreign Body		3 [2.0]		1 [2.0]
Glands, Inflammation, Acute	1 [1.0]			
Hemorrhage				1 [2.0]
Inflammation			4 [2.5]	
Inflammation, Acute	8 [2.0]	1 [2.0]		9 [2.1]
Lumen, Foreign Body	2 [2.0]			
Lumen, Inflammation, Acute	1 [1.0]	2 [2.0]		
Metaplasia, Focal	1 [1.0]			
Mucosa, Hyperplasia				1 [2.0]
Nasolacrim Dct, Metaplasia		1 [2.0]		
Septum, Inflammation, Acute		1 [2.0]		
Trachea	(56)	(58)	(52)	(53)
SPECIAL SENSES SYSTEM				
Eye	(66)	(66)	(65)	(62)
Anterior, Synechia		1 [2.0]		
Antr Chamber, Inflammation, Acute	1 [3.0]			
Cataract			18 [2.9]	
Cornea, Inflammation				1 [2.0]
Cornea, Necrosis	1 [3.0]		1 [4.0]	
Degeneration			3 [2.3]	
Inflammation			1 [3.0]	
Lens, Degeneration	1 [1.0]			
Harderian Gland	(39)	(16)	(46)	(34)
Lacrimal Gland	(63)	(67)	(60)	(61)
Dilatation			1 [3.0]	

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Species/Strain: Rat/F 344/N

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Test Compound: Wollastonite calcium silicates

CAS Number: 13983-17-0

Date Report Requested: 10/23/2014

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First Dose M/F: NA / NA

Lab: NORTHROP

F 344/N Rat MALE	CONTROL	10 MG/M3 24 MO	10 MG/M3 12 MO	10 MG/M3 ASBESTOS
Inflammation			1 [3.0]	
Inflammation, Acute	2 [2.0]			
Zymbal's Gland	(0)	(0)	(1)	(0)
URINARY SYSTEM				
Kidney	(65)	(66)	(62)	(65)
Abscess			1 [2.0]	
Cortex, Cyst				1 [2.0]
Epithelium, Papilla, Pelvis, Hyperplasia		2 [1.0]		
Epithelium, Pelvis, Hyperplasia		3 [2.0]	2 [3.5]	
Epithelium, Renal Tubule, Hyperplasia	1 [2.0]			
Hyperplasia			7 [2.7]	
Inflammation, Acute		1 [2.0]		
Metaplasia, Osseous	1 [2.0]			
Mineralization	1 [3.0]	2 [1.5]	2 [3.0]	
Nephropathy	58 [3.0]	57 [2.8]	58 [3.1]	60 [3.5]
Papilla, Necrosis, Acute		1 [2.0]		
Pelvis, Inflammation, Acute				1 [2.0]
Pelvis, Transit Epithe, Hyperplasia	7 [2.3]			9 [2.1]
Vein, Infarct				1 [2.0]
Vein, Thrombosis				1
Urethra	(0)	(2)	(0)	(0)
Urinary Bladder	(62)	(60)	(63)	(65)
Calculus Micro Observation Only	1		1	
Hyperplasia			1 [3.0]	
Inflammation			2 [2.5]	
Mineralization			1 [3.0]	
Mucosa, Hyperplasia, Diffuse		1 [2.0]		
Mucosa, Inflammation, Acute		1 [2.0]		

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Experiment Number: 05083-01

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: Rat/F 344/N

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AVERAGE SEVERITY GRADES[b]**

Test Compound: Wollastonite calcium silicates

CAS Number: 13983-17-0

Date Report Requested: 10/23/2014

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First Dose M/F: NA / NA

Lab: NORTHROP

F 344/N Rat MALE	CONTROL	10 MG/M3 24 MO	10 MG/M3 12 MO	10 MG/M3 ASBESTOS
Submucosa, Inflammation, Chronic		1 [2.0]		
Transit Epithe, Hyperplasia		1 [2.0]		

**** END OF REPORT ****

a - Number of animals examined microscopically at site and number of animals with lesion

b - Average severity grade (1-minimal; 2-mild; 3-moderate; 4-marked)