

## Pathology - Intergroup Comparison of Pathology Observations

For Study: 02G16015  
Title: Subchronic (13 week) brake dust inhalation toxicology study (nose-only) with lifelong follow-up in the rat  
Requested By: Dirk Schaudien  
Job Number: 51911  
Animal Reference: Animal Name  
Animals Excluded: 1000, 1001, 1002, 1003, 1010, 1011, 1012, 1013, 1020, 1021, 1022, 1023, 1030, 1031, 1032, 1033, 1050, 1051, 1052, 1053, 1060, 1061, 1062, 1063, 2000, 2001, 2002, 2003, 2010, 2011, 2012, 2013, 2020, 2021, 2022, 2023, 2030, 2031, 2032, 2033, 2050, 2051, 2052, 2053, 2060, 2061, 2062, 2063, 3000, 3001, + others.

Day Numbers: All  
Groups: All  
Observation Type: Histo - Neoplastic and Non-Neoplastic  
Observation Summary: Incidence  
Report Format: Group within Sex  
Tissues: All  
Rationalisation: None  
Removal Reasons: All  
Completed Animals Only: No  
Animals with Observations Only: No  
Major Pathological Findings Only: No  
Split Table by: Sex  
Use Alternative Descriptions: No  
Repeat First Group on Each Page: No  
Style: Landscape - 12 Columns  
Include: NVL Tissues; NE Tissues; Locators; Neoplastic - QUALIFIERS; TUMOUR TYPE; ORIGIN; CLASSIFICATION; Non-neoplastic - QUALIFIERS; SIZE

## Pathology - Intergroup Comparison of Pathology Observations

02G16015 - Subchronic (13 week) brake dust inhalation toxicology study  
(nose-only) with lifelong follow-up in the rat, 24 months post exposure - all

Removal Reason: ALL	Male					
	Clean air control	brake dust low	Brake dust mid	Brake dust high	Titanium-dioxide	Chrysotile low
Number of Animals:	31	31	31	31	31	31
Number of Completed Animals:	0	0	0	0	0	0
<b>lung</b>						
Examined	31	31	31	31	31	31
Adenocarcinoma; malignant	0	0	0	0	0	0
Adenoma, Bronchiolo-Alveolar; benign	1 c <sup>1</sup>	0	0	0	0	1
Adenoma, Bronchiolo-Alveolar; with atypia, benign	0	0	0	0	0	0
Carcinoma, Bronchiolo-Alveolar; malignant	0	0	0	1	1	0
alveolar/interstitial; Accumulation, Fibre-Laden Macrophages	0 +	0	0	0	0	0
alveolar/interstitial; Accumulation, Particle-Laden Macrophages	0 +	3	10 +	22 +	25 +	19 +
Autolysis	1	1	2	3	2	1
Congestion	1	1	1	0	1	1
alveolar; Edema	0	0	0	0	0	1
interstitial; Fibrosis	0 +	0	0	0	0	0
pleural; Fibrosis	2 +	0	0	0	0	0
Giant Cells, Syncytial	0 +	0	0	0	0	0
Granuloma, Cholesterol	6	5	3	5	2	3
alveolar; Hemorrhage; chronic	0	0	0	0	0	0
alveolar; Hemorrhage	0	0	0	0	0	0
alveolar; Hemorrhage; acute	0	0	0	0	1	0

+ [Footnote is displayed in the Comments and Markers page]

1 [c - Group Factor Chi-Squared & Fisher's Exact: Test: Chi-Squared p < 0.05]

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Removal Reason: ALL	Male					
	Clean air control	brake dust low	Brake dust mid	Brake dust high	Titanium-dioxide	Chrysotile low
Number of Animals:	31	31	31	31	31	31
Number of Completed Animals:	0	0	0	0	0	0
<b>lung (Continued...)</b>						
pleural; Hyperplasia	0	0	0	0	0	0
balt; Hyperplasia; lymphoid	0	0	0	0	0	0
Hyperplasia, Bronchiolo-Alveolar	0 <sup>1</sup>	0	2	4 <sup>c+</sup>	3	6 <sup>+</sup>
Hyperplasia, Bronchiolo-Alveolar; alveolar type	1	5	1	4	3	4
Hyperplasia, Bronchiolo-Alveolar; alveolar type with atypia	1	1	0	2	0	0
Hyperplasia, Mesothelial	0 <sup>c+</sup>	0	0	0	0	0
Hyperplasia, Neuroendocrine Cell	1	1	0	0	1	0
Infiltrated By Lymphoma/Leukaemic Cells	0	0	0	1	0	0
alveolar; Infiltration, Granulocytic Cell	0	0	0	0	0	0
peribronchiolar; Infiltration, Inflammatory Cell	0 <sup>1</sup>	0	0	0	0	0
perivascular; Infiltration, Inflammatory Cell	0 <sup>1</sup>	0	0	0	1	0
pleural; Infiltration, Inflammatory Cell	0	0	0	0	0	0
alveolar/interstitial; Infiltration, Inflammatory Cell	0 <sup>1</sup>	0	0	0	2	1
interstitial; Infiltration, Mononuclear Cell	9 <sup>1</sup>	3	1 <sup>+</sup>	10	7	2 <sup>c+</sup>
perivascular; Infiltration, Mononuclear Cell	0 <sup>+</sup>	0	0	0	0	0
pleural; Infiltration, Mononuclear Cell	6	3	4	8	6	3
Inflammation, Acute	2	0	1	0	0	1
Inflammation, Chronic	13 <sup>1</sup>	9	12	3 <sup>+</sup>	7	15

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Removal Reason: ALL	Male					
	Clean air control	brake dust low	Brake dust mid	Brake dust high	Titanium-dioxide	Chrysotile low
Number of Animals:	31	31	31	31	31	31
Number of Completed Animals:	0	0	0	0	0	0
<b>lung (Continued...)</b>						
Inflammation, Chronic Active	0	0	2	0	0	0
pleural; Inflammation, Chronic Active	0	0	0	0	0	0
Lipoproteinosis, Alveolar	0	1	2	1	0	0
Macrophage Aggregation, Alveolar	24 <sup>1</sup>	21	23	22	16 <sup>c+</sup>	20
Metaplasia, Chondro-Osseous	0	1	3	4	3	1
Metaplasia, Fibro-Osseous	0	0	0	0	1	0
Metastasis/-Es From Primary In Adrenal	0	0	0	0	0	0
Metastasis/-Es From Primary In Liver	0	0	0	0	0	0
Metastasis/-Es From Primary In Thyroid	1	1	0	0	0	0
Microgranuloma	0 <sup>+</sup>	0	0	0	0	0
Wagner Grade 2	0 <sup>+</sup>	3	10 <sup>+</sup>	22 <sup>+</sup>	25 <sup>+</sup>	18 <sup>+</sup>
Wagner Grade 3	0 <sup>+</sup>	0	0	0	0	1
Wagner Grade 4	0 <sup>+</sup>	0	0	0	0	0
Wagner Grade 1	31 <sup>+</sup>	28	21 <sup>+</sup>	9 <sup>+</sup>	6 <sup>+</sup>	12 <sup>+</sup>
Accumulation, Particle-Laden Macrophages, Balt	0 <sup>+</sup>	0	1	6 <sup>f+</sup>	20 <sup>+</sup>	1
Accumulation, Fibre-Laden Macrophages, Balt	0 <sup>+</sup>	0	0	0	0	0
Metastasis/-Es From Primary Site Unknown	0	0	0	1	0	0
Adhesion To Thoracic Wall	0	0	0	0	0	0

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1 [cc - Group Factor Chi-Squared & Fisher's Exact: Test: Chi-Squared p < 0.01]

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02G16015 - Subchronic (13 week) brake dust inhalation toxicology study  
(nose-only) with lifelong follow-up in the rat, 24 months post exposure - all

Removal Reason: ALL	Male					
	Clean air control	brake dust low	Brake dust mid	Brake dust high	Titanium-dioxide	Chrysotile low
Number of Animals:	31	31	31	31	31	31
Number of Completed Animals:	0	0	0	0	0	0
<b>lung associated lymph nodes (ln)</b>						
Examined	28	29	26	30	30	28
No Visible Lesions	27	28	24	22	11	22
Not Examined: No Significant Tissue Present In Section	3	2	5	1	1	3
Not Examined: Tissue Not Taken At Necropsy	0	0	0	0	0	0
Accumulation, Fibre-Laden Macrophages	0 <sup>1</sup>	0	0	0	0	0
Accumulation, Particle-Laden Macrophages	0 <sup>1</sup>	0	2	6 <sup>f+</sup>	18 <sup>+</sup>	3
Autolysis	1	1	0	2	0	1
Hyperplasia, Lymphoid	0	0	0	0	0	1
Infiltrated By Histiocytic Sarcoma Cells	0	0	0	0	1	0
Infiltrated By Lymphoma/Leukaemic Cells	0	0	0	1	0	0
Infiltration, Inflammatory Cell; plasmacytic	0	0	0	0	0	0
Resorption; blood	1	0	0	0	0	1
<b>larynx</b>						
Examined	31	31	31	31	31	31
No Visible Lesions	18	17	20	17	25	20
Not Examined: Tissue Not Taken At Necropsy	0	0	0	0	0	0
Autolysis	1	1	1	4	0	1
Dilatation, Submucosal Glands	0	0	2	4	1	2

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	Clean air control	brake dust low	Brake dust mid	Brake dust high	Titanium-dioxide	Chrysotile low
Number of Animals:	31	31	31	31	31	31
Number of Completed Animals:	0	0	0	0	0	0
<b>larynx (Continued...)</b>						
Erosion	1	0	0	0	0	0
Hyperplasia, Epithelial	0	0	0	0	1	0
subepithelial; Infiltration, Inflammatory Cell	6	4	6	1	0	3
subepithelial; Infiltration, Mononuclear Cell	6	8	4	6	6	7
Inflammation; chronic	0	1	0	0	0	0
<b>nasal cavity</b>						
Examined	31	31	30	30	31	31
No Visible Lesions	13	17	14	13	16	15
Not Examined: Autolysis Precludes Diagnosis	0	0	0	0	0	0
Autolysis	1	1	1	3	1	1
olfactory epithelial; Droplets, Hyaline	15	12	16	13	15	15
respiratory epithelial; Droplets, Hyaline	6	2	4	8	3	4
Hyperplasia, Mucous Cell	0	0	0	0	0	1
Hyperplasia, Respiratory Epithelial	1	1	0	0	1	0
Infiltrated By Tumour Cells	0	0	0	0	0	0
subepithelial; Infiltration, Inflammatory Cell	4 c <sup>1</sup>	2	0	0	0	0
Infiltration, Mononuclear Cell	0	0	0	0	0	0
Inflammation; purulent	0	0	0	0	0	0

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	Clean air control	brake dust low	Brake dust mid	Brake dust high	Titanium-dioxide	Chrysotile low
Number of Animals:	31	31	31	31	31	31
Number of Completed Animals:	0	0	0	0	0	0
<b>nasal cavity (Continued...)</b>						
Hyperplasia, Nalt	0	0	0	0	0	1
<b>nasopharynx</b>						
Examined	31	31	30	30	31	31
No Visible Lesions	30	30	29	30	31	30
Autolysis	1	1	1	0	0	1
Metastasis/-Es From Primary In Skin	0	0	0	0	0	0
<b>trachea</b>						
Examined	31	31	30	31	31	31
No Visible Lesions	27	26	26	26	28	29
Autolysis	1	1	2	4	2	1
subepithelial; Infiltration, Inflammatory Cell	0	0	0	0	0	0
subepithelial; Infiltration, Mononuclear Cell	3	4	2	1	1	1
<b>diaphragm</b>						
Examined	28	28	28	27	28	28
No Visible Lesions	26	27	27	27	26	27
Autolysis	1	1	0	0	0	1
Hyperplasia	0	0	0	0	0	0
Infiltrated By Histiocytic Sarcoma Cells	0	0	0	0	1	0
Infiltration, Inflammatory Cell; mixed	1	0	1	0	0	0

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	Clean air control	brake dust low	Brake dust mid	Brake dust high	Titanium-dioxide	Chrysotile low
Number of Animals:	31	31	31	31	31	31
Number of Completed Animals:	0	0	0	0	0	0
<b>diaphragm (Continued...)</b>						
Infiltration, Inflammatory Cell	0	0	0	0	1	0
Inflammation, Chronic Active	0	0	0	0	0	0
<b>liver</b>						
Examined	10	6	9	5	7	5
Adenoma, Hepatocellular; benign	1	0	1	0	0	0
Carcinoma, Hepatocellular; malignant with metastasis	0	0	0	0	0	0
Carcinoma, Hepatocellular; malignant	0	1	0	0	0	0
Angiectasis	3 c <sup>1</sup>	3	1	1	5	3
Autolysis	0	0	0	1	0	0
Change, Fatty	4	1	2	2	4	4
Cyst(S); blood-stained	0	0	1	0	0	0
Cyst(S)	0 c <sup>1</sup>	0	0	0	0	0
Degeneration, Cystic	0	0	0	0	1	0
Hyperplasia, Bile Duct	2	0	0	0	1	0
Infiltrated By Lymphoma/Leukaemic Cells	0	0	0	1	0	0
periportal; Infiltration, Inflammatory Cell; mixed	0	1	0	0	0	0
periportal; Infiltration, Inflammatory Cell	2	0	0	0	0	0
Infiltration, Mononuclear Cell	0 c <sup>1</sup>	1	1	0	1	0

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	Clean air control	brake dust low	Brake dust mid	Brake dust high	Titanium-dioxide	Chrysotile low
Number of Animals:	31	31	31	31	31	31
Number of Completed Animals:	0	0	0	0	0	0
<b>liver (Continued...)</b>						
Necrosis, Hepatocellular	0	0	1	0	0	0
Nodule, Hepatodiaphragmatic	0	0	1	0	0	0
Pigmentation	1	0	0	0	0	0
Focus Of Cellular Alteration, Clear Cell	0	0	0	1	0	0
Focus Of Cellular Alteration, Tigroid	6	2	3	2	2	2
Focus Of Cellular Alteration, Basophilic Nos	0	0	0	0	1	0
No Correlation To Macroscopic Lesion	0	1	0	0	0	0
Cyst, Bile Duct	1	1	0	0	0	0
<b>skin/subcutaneous tissue</b>						
Examined	2	6	11	7	5	8
Adenoma, Sebaceous Cell; benign	0	0	0	0	0	0
Carcinoma, Sebaceous Cell; malignant	0	0	0	0	0	0
Carcinoma, Squamous Cell; malignant	0	0	0	0	0	1
Fibroma; benign	0	0	1	1	1	2
Fibrosarcoma; malignant	0	1	0	0	0	0
Hemangiosarcoma; malignant	0	0	0	0	0	1
Keratoacanthoma; benign	0	0	0	1	0	1
Lipoma; benign	0	0	0	0	1	0

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	Clean air control	brake dust low	Brake dust mid	Brake dust high	Titanium-dioxide	Chrysotile low
Number of Animals:	31	31	31	31	31	31
Number of Completed Animals:	0	0	0	0	0	0
<b>skin/subcutaneous tissue (Continued...)</b>						
Papilloma; benign	0	0	1	0	0	0
Schwannoma, [M]; malignant	0	0	1	0	0	0
Tumor, Basal Cell, [B]; benign	0	0	0	0	0	0
Tumor, Hair Follicle, [B]; benign	1	1	3	4	1	0
Fibrosarcoma, Pleomorphic; malignant, incidental	0	0	0	1	0	0
subcutaneous; Abscess(Es)	0	0	0	0	0	0
Cyst(S), Squamous	0	0	1	0	0	1
Fibrosis, Dermal	1	2	0	0	1	0
Granulation Tissue; chronic	0	0	1	0	0	0
Hyperplasia, Epithelial; squamous	1	1	2	0	1	1
Inflammation, Acute	0	0	0	0	1	0
Inflammation, Chronic Active; ulcerated	0	1	2	0	0	0
Inflammation, Chronic Active	1	2	2	0	0	2
<b>pituitary gland</b>						
Examined	8	3	5	4	3	6
No Visible Lesions	0	0	0	0	0	1
Adenoma, Pars Distalis; benign	7	3	5	4	2	4
Adenoma, Pars Distalis; benign, probably fatal	0	0	0	0	1	0

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	Clean air control	brake dust low	Brake dust mid	Brake dust high	Titanium-dioxide	Chrysotile low
Number of Animals:	31	31	31	31	31	31
Number of Completed Animals:	0	0	0	0	0	0
<b>pituitary gland (Continued...)</b>						
Adenoma, Pars Distalis; multiple, benign	1	0	0	0	0	0
Carcinoma, Pars Distalis; malignant	0	0	0	0	0	0
Hyperplasia, Pars Distalis	0	1	0	0	0	1
No Correlation To Macroscopic Lesion	0	0	0	0	0	0
<b>brain</b>						
Examined	0	0	2	1	0	1
Astrocytoma, [M]; malignant, fatal	.	.	0	0	.	0
Oligodendroglioma, [M]; malignant	.	.	0	0	.	1
Tumor, Granular Cell, [M]; malignant	.	.	0	0	.	0
Compression	.	.	2	1	.	0
ventricular; Dilatation	.	.	2	1	.	0
Infiltrated By Tumour Cells	.	.	0	0	.	0
<b>thyroid gland</b>						
Examined	4	7	4	4	1	2
No Visible Lesions	0	0	0	0	0	0
Adenoma, C-Cell; benign	1	0	0	0	0	0
Adenoma, Follicular Cell; benign	0 <sup>1</sup>	0	0	3	0	0
Adenoma, Follicular Cell; cystic, benign	1	3	1	0	0	2

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	Clean air control	brake dust low	Brake dust mid	Brake dust high	Titanium-dioxide	Chrysotile low
Number of Animals:	31	31	31	31	31	31
Number of Completed Animals:	0	0	0	0	0	0
<b>thyroid gland (Continued...)</b>						
Carcinoma, C-Cell; malignant with metastasis	1	1	0	0	0	0
Carcinoma, C-Cell; malignant	0	0	0	0	0	0
Carcinoma, Follicular Cell; malignant	0	0	0	0	0	0
Hyperplasia, C-Cell	0	2	0	1	0	0
Hyperplasia, Follicular Cell; cystic	1	0	2	0	1	0
Follicle, Cystic	0	2	1	1	0	0
<b>parathyroid gland</b>						
Examined	1	0	0	1	0	0
No Visible Lesions	0	.	.	1	.	.
Hyperplasia	1	.	.	0	.	.
<b>adrenal gland</b>						
Examined	0	0	1	0	1	0
Adenoma, Cortical; benign	.	.	1	.	0	.
Carcinoma, Cortical; malignant with metastasis	.	.	0	.	0	.
Carcinoma, Cortical; malignant, probably fatal	.	.	0	.	0	.
Pheochromocytoma, [B]; benign	.	.	0	.	1	.
<b>testis</b>						
Examined	5	6	8	2	5	4
Adenoma, Interstitial (Leydig) Cell; benign	1	2	0	0	0	2

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	Clean air control	brake dust low	Brake dust mid	Brake dust high	Titanium-dioxide	Chrysotile low
Number of Animals:	31	31	31	31	31	31
Number of Completed Animals:	0	0	0	0	0	0
<b>testis (Continued...)</b>						
bilateral; Adenoma, Interstitial (Leydig) Cell; benign	0	0	0	0	0	0
Edema	1	1	5	1	4	1
Hyperplasia, Interstitial (Leydig) Cell	0	0	0	0	0	0
Hypertrophy, Mesothelial	0	0	1	0	0	0
Spermatocele, Rete Testis	1	0	0	0	0	0
Atrophy, Tubular	4	3	5	2	2	3
unilateral; Atrophy, Tubular	1	1	3	0	1	1
<b>epididymis</b>						
Examined	1	1	0	1	1	3
unilateral; Granuloma, Spermatic	1	1	.	0	0	0
Spermatocele	0	0	.	0	0	1
Reduced Sperm, Luminal	0	1	.	1	1	2
<b>prostate</b>						
Examined	1	0	5	0	2	3
No Visible Lesions	0	.	0	.	0	1
Atrophy	1	.	3	.	1	1
Dilatation	0	.	0	.	0	0
Hyperplasia	0	.	1	.	1	0

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	Clean air control	brake dust low	Brake dust mid	Brake dust high	Titanium-dioxide	Chrysotile low
Number of Animals:	31	31	31	31	31	31
Number of Completed Animals:	0	0	0	0	0	0
<b>prostate (Continued...)</b>						
Hyperplasia, Atypical	0	.	0	.	0	0
Inflammation; chronic	0	.	0	.	1	0
Inflammation	0	.	2	.	1	1
<b>seminal vesicles</b>						
Examined	3	2	5	2	2	3
No Visible Lesions	0	0	0	0	0	1
bilateral; Atrophy	3	2	4	2	2	2
Autolysis	0	0	0	1	0	1
Dilatation	0 c <sup>1</sup>	0	0	0	0	0
Infiltration, Mononuclear Cell	0	1	0	0	0	0
bilateral; Inflammation, Necrotizing	0	0	1	0	0	0
<b>kidney</b>						
Examined	3	4	3	4	2	7
Cyst(S)	0	1	0	0	0	0
Dilatation, Pelvic	0	0	0	0	0	1
Hyperplasia, Epithelial	0	0	0	0	0	0
Infiltration, Inflammatory Cell	1	0	0	0	0	0
pelvic; Infiltration, Inflammatory Cell	0	0	0	0	0	0

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	Clean air control	brake dust low	Brake dust mid	Brake dust high	Titanium-dioxide	Chrysotile low
Number of Animals:	31	31	31	31	31	31
Number of Completed Animals:	0	0	0	0	0	0
<b>kidney (Continued...)</b>						
Inflammation, Chronic Active	0	0	0	0	1	0
..... bilateral; Nephropathy, Chronic Progressive	2	3	3	4	1	6
..... No Correlation To Macroscopic Lesion	0	0	0	0	0	1
<b>spleen</b>						
Examined	1	1	3	3	2	3
..... Hemangioma; benign	1	0	0	0	0	0
..... Hemangioma; benign, probably fatal	0	0	0	0	1	0
..... Autolysis	0	0	0	1	0	0
..... Congestion	0	0	2	0	0	1
..... Degeneration	0	0	0	0	0	1
..... Extramedullary Hematopoiesis	0	1	1	1	0	1
..... Infiltrated By Histiocytic Sarcoma Cells	0	0	0	0	1	0
..... Infiltrated By Lymphoma/Leukaemic Cells	0	0	0	1	0	0
..... No Correlation To Macroscopic Lesion	0	0	0	1	0	0
<b>thymus</b>						
Examined	1	0	1	1	0	0
..... Thymoma, [B]; benign	0	.	1	0	.	.
..... Thymoma, [M]; malignant	1	.	0	0	.	.

## Pathology - Intergroup Comparison of Pathology Observations

02G16015 - Subchronic (13 week) brake dust inhalation toxicology study  
(nose-only) with lifelong follow-up in the rat, 24 months post exposure - all

Removal Reason: ALL	Male					
	Clean air control	brake dust low	Brake dust mid	Brake dust high	Titanium-dioxide	Chrysotile low
Number of Animals:	31	31	31	31	31	31
Number of Completed Animals:	0	0	0	0	0	0
<b>thymus (Continued...)</b>						
Autolysis	0	.	0	0	.	.
Congestion	0	.	0	0	.	.
Involution, Physiological	0	.	0	1	.	.
<b>hematopoietic tissue</b>						
Examined	0	0	0	1	1	0
Lymphoma, [M]; malignant	.	.	.	1	0	.
Sarcoma, Histiocytic; malignant	.	.	.	0	1	.
<b>stomach, glandular</b>						
Examined	0	0	0	0	0	0
Adenocarcinoma; malignant	.	.	.	.	.	.
mural; Inflammation; ulcerated	.	.	.	.	.	.
No Correlation To Macroscopic Lesion	.	.	.	.	.	.
<b>stomach, nonglandular</b>						
Examined	0	0	0	0	0	1
Hyperplasia, Squamous Cell	.	.	.	.	.	1
mural; Inflammation; ulcerated	.	.	.	.	.	1
mural; Inflammation	.	.	.	.	.	0
No Correlation To Macroscopic Lesion	.	.	.	.	.	0



## Pathology - Intergroup Comparison of Pathology Observations

02G16015 - Subchronic (13 week) brake dust inhalation toxicology study  
(nose-only) with lifelong follow-up in the rat, 24 months post exposure - all

Removal Reason: ALL	Male					
	Clean air control	brake dust low	Brake dust mid	Brake dust high	Titanium-dioxide	Chrysotile low
Number of Animals:	31	31	31	31	31	31
Number of Completed Animals:	0	0	0	0	0	0
<b>pancreas</b>						
Examined	1	0	0	0	0	0
Pheochromocytoma, Complex, [B]; benign	0	.	.	.	.	.
Dilatation, Ductal	1	.	.	.	.	.
<b>abdominal cavity</b>						
Examined	0	0	0	0	0	1
Fibrosarcoma; malignant	.	.	.	.	.	1
Mesothelioma, [M]; malignant	.	.	.	.	.	0
<b>tooth</b>						
Examined	1	3	1	4	4	1
Inflammation, Chronic Active	1	3	1	4	2	1
bilateral; Inflammation, Chronic Active	0	0	0	0	2	0
<b>oral cavity</b>						
Examined	1	0	0	0	0	0
Carcinoma, Adenosquamous; malignant	1	.	.	.	.	.
<b>eye</b>						
Examined	0	0	0	0	0	0
retinal; Atrophy	.	.	.	.	.	.
corneal; right; Inflammation	.	.	.	.	.	.

## Pathology - Intergroup Comparison of Pathology Observations

02G16015 - Subchronic (13 week) brake dust inhalation toxicology study  
(nose-only) with lifelong follow-up in the rat, 24 months post exposure - all

Removal Reason: ALL	Male					
	Clean air control	brake dust low	Brake dust mid	Brake dust high	Titanium-dioxide	Chrysotile low
Number of Animals:	31	31	31	31	31	31
Number of Completed Animals:	0	0	0	0	0	0
<b>esophagus</b>						
Examined	0	0	0	1	0	0
Dilatation	.	.	.	1	.	.
<b>lymph node, mandibular</b>						
Examined	0	0	0	1	1	0
Autolysis	.	.	.	1	0	.
Hyperplasia, Lymphoid	.	.	.	0	1	.
Infiltrated By Lymphoma/Leukaemic Cells	.	.	.	1	0	.
<b>lymph node, mesenteric</b>						
Examined	0	0	0	1	0	0
Hemangiosarcoma; malignant	.	.	.	1	.	.
<b>lymph node, mediastinal</b>						
Examined	0	1	4	0	1	0
Hemangiosarcoma; malignant	.	0	0	.	1	.
Resorption; blood	.	1	4	.	0	.
<b>jejunum</b>						
Examined	0	0	0	0	0	1
Leiomyosarcoma; malignant	.	.	.	.	.	1
<b>preputial gland</b>						
Examined	1	0	0	0	0	0

Pathology - Intergroup Comparison of Pathology Observations

02G16015 - Subchronic (13 week) brake dust inhalation toxicology study  
(nose-only) with lifelong follow-up in the rat, 24 months post exposure - all

Removal Reason: ALL	Male						
	Clean air control	brake dust low	Brake dust mid	Brake dust high	Titanium-dioxide	Chrysotile low	
Number of Animals:	31	31	31	31	31	31	
Number of Completed Animals:	0	0	0	0	0	0	
<b>preputial gland (Continued...)</b>							
Inflammation, Chronic Active	1	.	.	.	.	.	

## Pathology - Intergroup Comparison of Pathology Observations

02G16015 - Subchronic (13 week) brake dust inhalation toxicology study  
(nose-only) with lifelong follow-up in the rat, 24 months post exposure - all

Removal Reason: ALL	Male		
	Chrysotile high	Crocidolite	Amosite
Number of Animals:	31	31	31
Number of Completed Animals:	0	0	0
<b>lung</b>			
Examined	31	31	31
Adenocarcinoma; malignant	0	0	1
Adenoma, Bronchiolo-Alveolar; benign	0	1	4
Adenoma, Bronchiolo-Alveolar; with atypia, benign	0	1	1
Carcinoma, Bronchiolo-Alveolar; malignant	0	3	3
alveolar/interstitial; Accumulation, Fibre-Laden Macrophages	0	29 <sup>1</sup>	29 <sup>1</sup>
alveolar/interstitial; Accumulation, Particle-Laden Macrophages	22 <sup>1</sup>	0	0
Autolysis	5	5	2
Congestion	4	0	0
alveolar; Edema	1	0	0
interstitial; Fibrosis	1	29 <sup>1</sup>	29 <sup>1</sup>
pleural; Fibrosis	0	2	4
Giant Cells, Syncytial	0	26 <sup>1</sup>	27 <sup>1</sup>
Granuloma, Cholesterol	5	0	0
alveolar; Hemorrhage; chronic	0	1	2
alveolar; Hemorrhage	0	1	0
alveolar; Hemorrhage; acute	0	0	0

1 [ccc - Test: Chi-Squared - Pearson 2 Sided p < 0.001]

## Pathology - Intergroup Comparison of Pathology Observations

02G16015 - Subchronic (13 week) brake dust inhalation toxicology study  
(nose-only) with lifelong follow-up in the rat, 24 months post exposure - all

Removal Reason: ALL	Male		
	Chrysotile high	Crocido-lite	Amosite
Number of Animals:	31	31	31
Number of Completed Animals:	0	0	0
<b>lung (Continued...)</b>			
pleural; Hyperplasia	1	1	0
balt; Hyperplasia; lymphoid	0	0	1
Hyperplasia, Bronchiolo-Alveolar	20 <sup>1</sup>	30 <sup>1</sup>	30 <sup>1</sup>
Hyperplasia, Bronchiolo-Alveolar; alveolar type	7	8	6
Hyperplasia, Bronchiolo-Alveolar; alveolar type with atypia	1	4	3
Hyperplasia, Mesothelial	0	3	2
Hyperplasia, Neuroendocrine Cell	1	0	0
Infiltrated By Lymphoma/Leukaemic Cells	0	0	0
alveolar; Infiltration, Granulocytic Cell	1	0	1
peribronchiolar; Infiltration, Inflammatory Cell	0	10 <sup>+</sup>	11 <sup>+</sup>
perivascular; Infiltration, Inflammatory Cell	0	10 <sup>+</sup>	12 <sup>+</sup>
pleural; Infiltration, Inflammatory Cell	0	2	0
alveolar/interstitial; Infiltration, Inflammatory Cell	1	27 <sup>1</sup>	28 <sup>1</sup>
interstitial; Infiltration, Mononuclear Cell	10	0 <sup>+</sup>	3
perivascular; Infiltration, Mononuclear Cell	0	1	4
pleural; Infiltration, Mononuclear Cell	3	2	3
Inflammation, Acute	1	0	1
Inflammation, Chronic	13	2 <sup>+</sup>	3 <sup>+</sup>

+ [Footnote is displayed in the Comments and Markers page]

1 [ccc - Test: Chi-Squared - Pearson 2 Sided p < 0.001]

## Pathology - Intergroup Comparison of Pathology Observations

02G16015 - Subchronic (13 week) brake dust inhalation toxicology study  
(nose-only) with lifelong follow-up in the rat, 24 months post exposure - all

Removal Reason: ALL	Male		
	Chrysotile high	Crocidolite	Amosite
Number of Animals:	31	31	31
Number of Completed Animals:	0	0	0
<b>lung (Continued...)</b>			
Inflammation, Chronic Active	1	0	0
pleural; Inflammation, Chronic Active	1	0	0
Lipoproteinosis, Alveolar	0	1	0
Macrophage Aggregation, Alveolar	18	12 <sup>1</sup>	10 <sup>+</sup>
Metaplasia, Chondro-Osseous	2	1	0
Metaplasia, Fibro-Osseous	0	0	0
Metastasis/-Es From Primary In Adrenal	0	0	1
Metastasis/-Es From Primary In Liver	0	0	1
Metastasis/-Es From Primary In Thyroid	0	0	0
Microgranuloma	0	21 <sup>+</sup>	24 <sup>+</sup>
Wagner Grade 2	14 <sup>+</sup>	0	0
Wagner Grade 3	12 <sup>+</sup>	0	0
Wagner Grade 4	1	31 <sup>+</sup>	31 <sup>+</sup>
Wagner Grade 1	4 <sup>+</sup>	0 <sup>+</sup>	0 <sup>+</sup>
Accumulation, Particle-Laden Macrophages, Balt	2	0	0
Accumulation, Fibre-Laden Macrophages, Balt	0	4	5
Metastasis/-Es From Primary Site Unknown	0	0	0
Adhesion To Thoracic Wall	0	0	1

+ [Footnote is displayed in the Comments and Markers page]

1 [cc - Test: Chi-Squared - Pearson 2 Sided p < 0.01]

## Pathology - Intergroup Comparison of Pathology Observations

02G16015 - Subchronic (13 week) brake dust inhalation toxicology study  
(nose-only) with lifelong follow-up in the rat, 24 months post exposure - all

Removal Reason: ALL	Male		
	Chrysotile high	Crocidolite	Amosite
Number of Animals:	31	31	31
Number of Completed Animals:	0	0	0
<b>lung associated lymph nodes (ln)</b>			
Examined	28	29	30
No Visible Lesions	19	11	17
Not Examined: No Significant Tissue Present In Section	2	2	1
Not Examined: Tissue Not Taken At Necropsy	1	0	0
Accumulation, Fibre-Laden Macrophages	0	16 <sup>1</sup>	11 <sup>1</sup>
Accumulation, Particle-Laden Macrophages	6 <sup>f+</sup>	0	0
Autolysis	2	2	0
Hyperplasia, Lymphoid	0	0	1
Infiltrated By Histiocytic Sarcoma Cells	0	0	0
Infiltrated By Lymphoma/Leukaemic Cells	0	0	0
Infiltration, Inflammatory Cell; plasmacytic	1	0	0
Resorption; blood	0	0	1
<b>larynx</b>			
Examined	29	31	31
No Visible Lesions	20	22	21
Not Examined: Tissue Not Taken At Necropsy	2	0	0
Autolysis	3	1	1
Dilatation, Submucosal Glands	0	1	3

+ [Footnote is displayed in the Comments and Markers page]

1 [fff - Test: Fisher's Exact 2 Sided p < 0.001]

Pathology - Intergroup Comparison of Pathology Observations

02G16015 - Subchronic (13 week) brake dust inhalation toxicology study  
(nose-only) with lifelong follow-up in the rat, 24 months post exposure - all

Removal Reason: ALL	Male		
	Chrysotile high	Crocidolite	Amosite
Number of Animals:	31	31	31
Number of Completed Animals:	0	0	0
<b>larynx (Continued...)</b>			
Erosion	0	0	0
Hyperplasia, Epithelial	0	0	0
subepithelial; Infiltration, Inflammatory Cell	2	1	3
subepithelial; Infiltration, Mononuclear Cell	5	6	4
Inflammation; chronic	0	0	0
<b>nasal cavity</b>			
Examined	31	30	31
No Visible Lesions	14	20	17
Not Examined: Autolysis Precludes Diagnosis	0	1	0
Autolysis	5	2	0
olfactory epithelial; Droplets, Hyaline	13	7	12
respiratory epithelial; Droplets, Hyaline	4	4	9
Hyperplasia, Mucous Cell	0	1	0
Hyperplasia, Respiratory Epithelial	0	0	0
Infiltrated By Tumour Cells	1	0	0
subepithelial; Infiltration, Inflammatory Cell	0	0	1
Infiltration, Mononuclear Cell	1	0	2
Inflammation; purulent	0	0	1



Pathology - Intergroup Comparison of Pathology Observations

02G16015 - Subchronic (13 week) brake dust inhalation toxicology study  
(nose-only) with lifelong follow-up in the rat, 24 months post exposure - all

Removal Reason: ALL	Male		
	Chrysotile high	Crocidolite	Amosite
Number of Animals:	31	31	31
Number of Completed Animals:	0	0	0
<b>nasal cavity (Continued...)</b>			
Hyperplasia, Nalt	0	0	0
<b>nasopharynx</b>			
Examined	31	31	31
No Visible Lesions	30	29	30
Autolysis	1	2	0
Metastasis/-Es From Primary In Skin	0	0	1
<b>trachea</b>			
Examined	31	31	31
No Visible Lesions	24	28	26
Autolysis	5	3	2
subepithelial; Infiltration, Inflammatory Cell	0	0	1
subepithelial; Infiltration, Mononuclear Cell	2	0	2
<b>diaphragm</b>			
Examined	29	29	29
No Visible Lesions	26	25	26
Autolysis	2	1	1
Hyperplasia	0	0	1
Infiltrated By Histiocytic Sarcoma Cells	0	0	0
Infiltration, Inflammatory Cell; mixed	0	3	1

## Pathology - Intergroup Comparison of Pathology Observations

02G16015 - Subchronic (13 week) brake dust inhalation toxicology study  
(nose-only) with lifelong follow-up in the rat, 24 months post exposure - all

Removal Reason: ALL	Male		
	Chrysotile high	Crocidolite	Amosite
Number of Animals:	31	31	31
Number of Completed Animals:	0	0	0
<b>diaphragm (Continued...)</b>			
Infiltration, Inflammatory Cell	0	0	0
Inflammation, Chronic Active	1	0	1
<b>liver</b>			
Examined	8	16	10
Adenoma, Hepatocellular; benign	0	1	1
Carcinoma, Hepatocellular; malignant with metastasis	0	0	1
Carcinoma, Hepatocellular; malignant	0	0	0
Angiectasis	5	12 f <sup>1</sup>	4
Autolysis	0	0	0
Change, Fatty	7	6	4
Cyst(S); blood-stained	0	0	0
Cyst(S)	0	0	3
Degeneration, Cystic	0	0	0
Hyperplasia, Bile Duct	2	1	0
Infiltrated By Lymphoma/Leukaemic Cells	0	0	0
periportal; Infiltration, Inflammatory Cell; mixed	0	0	0
periportal; Infiltration, Inflammatory Cell	1	1	0
Infiltration, Mononuclear Cell	4 f <sup>1</sup>	1	0

1 [f - Test: Fisher's Exact 2 Sided p < 0.05]

## Pathology - Intergroup Comparison of Pathology Observations

02G16015 - Subchronic (13 week) brake dust inhalation toxicology study  
(nose-only) with lifelong follow-up in the rat, 24 months post exposure - all

Removal Reason: ALL	Male		
	Chrysotile high	Crocido-lite	Amosite
Number of Animals:	31	31	31
Number of Completed Animals:	0	0	0
<b>liver (Continued...)</b>			
Necrosis, Hepatocellular	0	1	0
Nodule, Hepatodiaphragmatic	0	0	0
Pigmentation	0	0	0
Focus Of Cellular Alteration, Clear Cell	0	0	0
Focus Of Cellular Alteration, Tigroid	5	4	1
Focus Of Cellular Alteration, Basophilic Nos	0	3	1
No Correlation To Macroscopic Lesion	0	0	0
Cyst, Bile Duct	0	1	0
<b>skin/subcutaneous tissue</b>			
Examined	4	7	3
Adenoma, Sebaceous Cell; benign	1	0	0
Carcinoma, Sebaceous Cell; malignant	0	1	1
Carcinoma, Squamous Cell; malignant	0	0	1
Fibroma; benign	1	0	1
Fibrosarcoma; malignant	1	2	1
Hemangiosarcoma; malignant	0	0	0
Keratoacanthoma; benign	0	1	0
Lipoma; benign	0	0	0

Pathology - Intergroup Comparison of Pathology Observations

02G16015 - Subchronic (13 week) brake dust inhalation toxicology study  
(nose-only) with lifelong follow-up in the rat, 24 months post exposure - all

Removal Reason: ALL	Male		
	Chrysotile high	Crocidolite	Amosite
Number of Animals:	31	31	31
Number of Completed Animals:	0	0	0
<b>skin/subcutaneous tissue (Continued...)</b>			
Papilloma; benign	0	0	0
Schwannoma, [M]; malignant	0	0	0
Tumor, Basal Cell, [B]; benign	0	1	0
Tumor, Hair Follicle, [B]; benign	0	1	0
Fibrosarcoma, Pleomorphic; malignant, incidental	0	0	0
subcutaneous; Abscess(Es)	0	1	0
Cyst(S), Squamous	0	0	0
Fibrosis, Dermal	0	0	0
Granulation Tissue; chronic	0	0	0
Hyperplasia, Epithelial; squamous	0	1	0
Inflammation, Acute	0	0	0
Inflammation, Chronic Active; ulcerated	1	1	0
Inflammation, Chronic Active	0	0	0
<b>pituitary gland</b>			
Examined	6	6	6
No Visible Lesions	0	0	0
Adenoma, Pars Distalis; benign	3	6	6
Adenoma, Pars Distalis; benign, probably fatal	0	0	0

## Pathology - Intergroup Comparison of Pathology Observations

02G16015 - Subchronic (13 week) brake dust inhalation toxicology study  
(nose-only) with lifelong follow-up in the rat, 24 months post exposure - all

Removal Reason: ALL	Male		
	Chrysotile high	Crocidolite	Amosite
Number of Animals:	31	31	31
Number of Completed Animals:	0	0	0
<b>pituitary gland (Continued...)</b>			
Adenoma, Pars Distalis; multiple, benign	1	0	0
Carcinoma, Pars Distalis; malignant	1	0	0
Hyperplasia, Pars Distalis	0	0	0
No Correlation To Macroscopic Lesion	1	0	0
<b>brain</b>			
Examined	2	0	1
Astrocytoma, [M]; malignant, fatal	1	.	0
Oligodendroglioma, [M]; malignant	0	.	0
Tumor, Granular Cell, [M]; malignant	0	.	1
Compression	1	.	0
ventricular; Dilatation	1	.	0
Infiltrated By Tumour Cells	1	.	0
<b>thyroid gland</b>			
Examined	2	2	1
No Visible Lesions	0	1	0
Adenoma, C-Cell; benign	0	0	0
Adenoma, Follicular Cell; benign	0	0	1
Adenoma, Follicular Cell; cystic, benign	0	0	0

## Pathology - Intergroup Comparison of Pathology Observations

02G16015 - Subchronic (13 week) brake dust inhalation toxicology study  
(nose-only) with lifelong follow-up in the rat, 24 months post exposure - all

Removal Reason: ALL	Male		
	Chrysotile high	Crocidolite	Amosite
Number of Animals:	31	31	31
Number of Completed Animals:	0	0	0
<b>thyroid gland (Continued...)</b>			
Carcinoma, C-Cell; malignant with metastasis	0	0	0
Carcinoma, C-Cell; malignant	1	0	0
Carcinoma, Follicular Cell; malignant	1	0	0
Hyperplasia, C-Cell	0	1	0
Hyperplasia, Follicular Cell; cystic	0	0	0
Follicle, Cystic	0	0	0
<b>parathyroid gland</b>			
Examined	0	0	0
No Visible Lesions	.	.	.
Hyperplasia	.	.	.
<b>adrenal gland</b>			
Examined	0	1	1
Adenoma, Cortical; benign	.	0	0
Carcinoma, Cortical; malignant with metastasis	.	0	1
Carcinoma, Cortical; malignant, probably fatal	.	1	0
Pheochromocytoma, [B]; benign	.	0	0
<b>testis</b>			
Examined	4	3	5
Adenoma, Interstitial (Leydig) Cell; benign	1	1	0

## Pathology - Intergroup Comparison of Pathology Observations

02G16015 - Subchronic (13 week) brake dust inhalation toxicology study  
(nose-only) with lifelong follow-up in the rat, 24 months post exposure - all

Removal Reason: ALL	Male		
	Chrysotile high	Crocidolite	Amosite
Number of Animals:	31	31	31
Number of Completed Animals:	0	0	0
<b>testis (Continued...)</b>			
bilateral; Adenoma, Interstitial (Leydig) Cell; benign	1	0	0
Edema	1	0	1
Hyperplasia, Interstitial (Leydig) Cell	0	0	1
Hypertrophy, Mesothelial	0	0	0
Spermatocoele, Rete Testis	0	0	0
Atrophy, Tubular	1	2	4
unilateral; Atrophy, Tubular	0	0	1
<b>epididymis</b>			
Examined	1	1	1
unilateral; Granuloma, Spermatic	0	0	0
Spermatocoele	0	0	0
Reduced Sperm, Luminal	1	1	1
<b>prostate</b>			
Examined	1	3	6
No Visible Lesions	0	0	0
Atrophy	0	2	3
Dilatation	0	1	0
Hyperplasia	0	0	1

## Pathology - Intergroup Comparison of Pathology Observations

02G16015 - Subchronic (13 week) brake dust inhalation toxicology study  
(nose-only) with lifelong follow-up in the rat, 24 months post exposure - all

Removal Reason: ALL	Male		
	Chrysotile high	Crocido-lite	Amosite
Number of Animals:	31	31	31
Number of Completed Animals:	0	0	0
<b>prostate (Continued...)</b>			
Hyperplasia, Atypical	1	0	0
Inflammation; chronic	0	0	0
Inflammation	0	0	3
<b>seminal vesicles</b>			
Examined	2	3	6
No Visible Lesions	0	0	0
bilateral; Atrophy	1	1	5
Autolysis	2	0	1
Dilatation	0	2	0
Infiltration, Mononuclear Cell	0	0	0
bilateral; Inflammation, Necrotizing	0	0	0
<b>kidney</b>			
Examined	6	2	7
Cyst(S)	0	0	0
Dilatation, Pelvic	1	0	0
Hyperplasia, Epithelial	0	0	1
Infiltration, Inflammatory Cell	0	0	0
pelvic; Infiltration, Inflammatory Cell	0	0	1



## Pathology - Intergroup Comparison of Pathology Observations

02G16015 - Subchronic (13 week) brake dust inhalation toxicology study  
(nose-only) with lifelong follow-up in the rat, 24 months post exposure - all

Removal Reason: ALL	Male		
	Chrysotile high	Crocidolite	Amosite
Number of Animals:	31	31	31
Number of Completed Animals:	0	0	0
<b>kidney (Continued...)</b>			
Inflammation, Chronic Active	0	0	0
bilateral; Nephropathy, Chronic Progressive	6	2	7
No Correlation To Macroscopic Lesion	0	0	0
<b>spleen</b>			
Examined	0	2	2
Hemangioma; benign	.	0	0
Hemangioma; benign, probably fatal	.	0	0
Autolysis	.	0	0
Congestion	.	1	2
Degeneration	.	0	0
Extramedullary Hematopoiesis	.	2	1
Infiltrated By Histiocytic Sarcoma Cells	.	0	0
Infiltrated By Lymphoma/Leukaemic Cells	.	0	0
No Correlation To Macroscopic Lesion	.	0	0
<b>thymus</b>			
Examined	2	1	0
Thymoma, [B]; benign	1	0	.
Thymoma, [M]; malignant	0	0	.

## Pathology - Intergroup Comparison of Pathology Observations

02G16015 - Subchronic (13 week) brake dust inhalation toxicology study  
(nose-only) with lifelong follow-up in the rat, 24 months post exposure - all

Removal Reason: ALL	Male		
	Chrysotile high	Crocidolite	Amosite
Number of Animals:	31	31	31
Number of Completed Animals:	0	0	0
<b>thymus (Continued...)</b>			
Autolysis	0	1	.
Congestion	1	0	.
Involution, Physiological	0	0	.
<b>hematopoietic tissue</b>			
Examined	0	0	0
Lymphoma, [M]; malignant	.	.	.
Sarcoma, Histiocytic; malignant	.	.	.
<b>stomach, glandular</b>			
Examined	1	1	1
Adenocarcinoma; malignant	0	1	0
mural; Inflammation; ulcerated	0	0	1
No Correlation To Macroscopic Lesion	1	0	0
<b>stomach, nonglandular</b>			
Examined	1	0	3
Hyperplasia, Squamous Cell	0	.	2
mural; Inflammation; ulcerated	0	.	1
mural; Inflammation	0	.	1
No Correlation To Macroscopic Lesion	1	.	0

Pathology - Intergroup Comparison of Pathology Observations

02G16015 - Subchronic (13 week) brake dust inhalation toxicology study  
(nose-only) with lifelong follow-up in the rat, 24 months post exposure - all

Removal Reason: ALL	Male		
	Chrysotile high	Crocidolite	Amosite
Number of Animals:	31	31	31
Number of Completed Animals:	0	0	0
<b>pancreas</b>			
Examined	0	0	1
Pheochromocytoma, Complex, [B]; benign	.	.	1
Dilatation, Ductal	.	.	0
<b>abdominal cavity</b>			
Examined	0	1	0
Fibrosarcoma; malignant	.	0	.
Mesothelioma, [M]; malignant	.	1	.
<b>tooth</b>			
Examined	2	0	0
Inflammation, Chronic Active	2	.	.
bilateral; Inflammation, Chronic Active	0	.	.
<b>oral cavity</b>			
Examined	0	0	0
Carcinoma, Adenosquamous; malignant	.	.	.
<b>eye</b>			
Examined	0	0	1
retinal; Atrophy	.	.	1
corneal; right; Inflammation	.	.	1

## Pathology - Intergroup Comparison of Pathology Observations

02G16015 - Subchronic (13 week) brake dust inhalation toxicology study  
(nose-only) with lifelong follow-up in the rat, 24 months post exposure - all

Removal Reason: ALL	Male		
	Chrysotile high	Crocido-lite	Amosite
Number of Animals:	31	31	31
Number of Completed Animals:	0	0	0
<b>esophagus</b>			
Examined	0	0	0
Dilatation	.	.	.
<b>lymph node, mandibular</b>			
Examined	0	0	0
Autolysis	.	.	.
Hyperplasia, Lymphoid	.	.	.
Infiltrated By Lymphoma/Leukaemic Cells	.	.	.
<b>lymph node, mesenteric</b>			
Examined	0	0	0
Hemangiosarcoma; malignant	.	.	.
<b>lymph node, mediastinal</b>			
Examined	0	0	0
Hemangiosarcoma; malignant	.	.	.
Resorption; blood	.	.	.
<b>jejunum</b>			
Examined	0	0	0
Leiomyosarcoma; malignant	.	.	.
<b>preputial gland</b>			
Examined	0	0	0

Pathology - Intergroup Comparison of Pathology Observations

02G16015 - Subchronic (13 week) brake dust inhalation toxicology study  
 (nose-only) with lifelong follow-up in the rat, 24 months post exposure - all

Removal Reason: ALL	Male			
	Chrysotile high	Crocidolite	Amosite	
Number of Animals:	31	31	31	
Number of Completed Animals:	0	0	0	
<b>preputial gland (Continued...)</b> Inflammation, Chronic Active	.	.	.	

## Pathology - Intergroup Comparison of Pathology Observations

02G16015 - Subchronic (13 week) brake dust inhalation toxicology study  
(nose-only) with lifelong follow-up in the rat, 24 months post exposure - all

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Comments and Markers

Removal Reason	Sex	Group	Measurement	Marker
ALL	Male	1	lung : Adenoma, Bronchiolo-Alveolar; benign <i>Comment:</i> Group Factor Chi-Squared & Fisher's Exact: Test: Chi-Squared p < 0.05	c
ALL	Male	1	lung : alveolar/interstitial; Accumulation, Fibre-Laden Macrophages <i>Comment:</i> Group Factor Chi-Squared & Fisher's Exact: Test: Chi-Squared p < 0.001	ccc
ALL	Male	1	lung : alveolar/interstitial; Accumulation, Particle-Laden Macrophages <i>Comment:</i> Group Factor Chi-Squared & Fisher's Exact: Test: Chi-Squared p < 0.001	ccc
ALL	Male	3	lung : alveolar/interstitial; Accumulation, Particle-Laden Macrophages <i>Comment:</i> Test: Chi-Squared - Pearson 2 Sided p < 0.001	ccc
ALL	Male	4	lung : alveolar/interstitial; Accumulation, Particle-Laden Macrophages <i>Comment:</i> Test: Chi-Squared - Pearson 2 Sided p < 0.001	ccc
ALL	Male	5	lung : alveolar/interstitial; Accumulation, Particle-Laden Macrophages <i>Comment:</i> Test: Chi-Squared - Pearson 2 Sided p < 0.001	ccc
ALL	Male	6	lung : alveolar/interstitial; Accumulation, Particle-Laden Macrophages <i>Comment:</i> Test: Chi-Squared - Pearson 2 Sided p < 0.001	ccc
ALL	Male	1	lung : interstitial; Fibrosis <i>Comment:</i> Group Factor Chi-Squared & Fisher's Exact: Test: Chi-Squared p < 0.001	ccc
ALL	Male	1	lung : pleural; Fibrosis <i>Comment:</i> Group Factor Chi-Squared & Fisher's Exact: Test: Chi-Squared p < 0.01	cc
ALL	Male	1	lung : Giant Cells, Syncytial <i>Comment:</i> Group Factor Chi-Squared & Fisher's Exact: Test: Chi-Squared p < 0.001	ccc
ALL	Male	1	lung : Hyperplasia, Bronchiolo-Alveolar <i>Comment:</i> Group Factor Chi-Squared & Fisher's Exact: Test: Chi-Squared p < 0.001	ccc

## Pathology - Intergroup Comparison of Pathology Observations

02G16015 - Subchronic (13 week) brake dust inhalation toxicology study  
(nose-only) with lifelong follow-up in the rat, 24 months post exposure - all

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Comments and Markers

Removal Reason	Sex	Group	Measurement	Marker
ALL	Male	4	lung : Hyperplasia, Bronchiolo-Alveolar <i>Comment:</i> Test: Chi-Squared - Pearson 2 Sided p < 0.05	c
ALL	Male	6	lung : Hyperplasia, Bronchiolo-Alveolar <i>Comment:</i> Test: Chi-Squared - Pearson 2 Sided p < 0.01	cc
ALL	Male	1	lung : Hyperplasia, Mesothelial <i>Comment:</i> Group Factor Chi-Squared & Fisher's Exact: Test: Chi-Squared p < 0.05	c
ALL	Male	1	lung : peribronchiolar; Infiltration, Inflammatory Cell <i>Comment:</i> Group Factor Chi-Squared & Fisher's Exact: Test: Chi-Squared p < 0.001	ccc
ALL	Male	1	lung : perivascular; Infiltration, Inflammatory Cell <i>Comment:</i> Group Factor Chi-Squared & Fisher's Exact: Test: Chi-Squared p < 0.001	ccc
ALL	Male	1	lung : alveolar/interstitial; Infiltration, Inflammatory Cell <i>Comment:</i> Group Factor Chi-Squared & Fisher's Exact: Test: Chi-Squared p < 0.001	ccc
ALL	Male	1	lung : interstitial; Infiltration, Mononuclear Cell <i>Comment:</i> Group Factor Chi-Squared & Fisher's Exact: Test: Chi-Squared p < 0.001	ccc
ALL	Male	3	lung : interstitial; Infiltration, Mononuclear Cell <i>Comment:</i> Test: Chi-Squared - Pearson 2 Sided p < 0.01	cc
ALL	Male	6	lung : interstitial; Infiltration, Mononuclear Cell <i>Comment:</i> Test: Chi-Squared - Pearson 2 Sided p < 0.05	c
ALL	Male	1	lung : perivascular; Infiltration, Mononuclear Cell <i>Comment:</i> Group Factor Chi-Squared & Fisher's Exact: Test: Chi-Squared p < 0.01	cc
ALL	Male	1	lung : Inflammation, Chronic <i>Comment:</i> Group Factor Chi-Squared & Fisher's Exact: Test: Chi-Squared p < 0.001	ccc

## Pathology - Intergroup Comparison of Pathology Observations

02G16015 - Subchronic (13 week) brake dust inhalation toxicology study  
(nose-only) with lifelong follow-up in the rat, 24 months post exposure - all

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Comments and Markers

Removal Reason	Sex	Group	Measurement	Marker
ALL	Male	4	lung : Inflammation, Chronic <i>Comment:</i> Test: Chi-Squared - Pearson 2 Sided p < 0.01	cc
ALL	Male	1	lung : Macrophage Aggregation, Alveolar <i>Comment:</i> Group Factor Chi-Squared & Fisher's Exact: Test: Chi-Squared p < 0.01	cc
ALL	Male	5	lung : Macrophage Aggregation, Alveolar <i>Comment:</i> Test: Chi-Squared - Pearson 2 Sided p < 0.05	c
ALL	Male	1	lung : Microgranuloma <i>Comment:</i> Group Factor Chi-Squared & Fisher's Exact: Test: Chi-Squared p < 0.001	ccc
ALL	Male	1	lung : Wagner Grade 2 <i>Comment:</i> Group Factor Chi-Squared & Fisher's Exact: Test: Chi-Squared p < 0.001	ccc
ALL	Male	3	lung : Wagner Grade 2 <i>Comment:</i> Test: Chi-Squared - Pearson 2 Sided p < 0.001	ccc
ALL	Male	4	lung : Wagner Grade 2 <i>Comment:</i> Test: Chi-Squared - Pearson 2 Sided p < 0.001	ccc
ALL	Male	5	lung : Wagner Grade 2 <i>Comment:</i> Test: Chi-Squared - Pearson 2 Sided p < 0.001	ccc
ALL	Male	6	lung : Wagner Grade 2 <i>Comment:</i> Test: Chi-Squared - Pearson 2 Sided p < 0.001	ccc
ALL	Male	1	lung : Wagner Grade 3 <i>Comment:</i> Group Factor Chi-Squared & Fisher's Exact: Test: Chi-Squared p < 0.001	ccc
ALL	Male	1	lung : Wagner Grade 4 <i>Comment:</i> Group Factor Chi-Squared & Fisher's Exact: Test: Chi-Squared p < 0.001	ccc



## Pathology - Intergroup Comparison of Pathology Observations

02G16015 - Subchronic (13 week) brake dust inhalation toxicology study  
(nose-only) with lifelong follow-up in the rat, 24 months post exposure - all

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Comments and Markers

Removal Reason	Sex	Group	Measurement	Marker
ALL	Male	1	lung : Wagner Grade 1 <i>Comment:</i> Group Factor Chi-Squared & Fisher's Exact: Test: Chi-Squared p < 0.001	ccc
ALL	Male	3	lung : Wagner Grade 1 <i>Comment:</i> Test: Chi-Squared - Pearson 2 Sided p < 0.001	ccc
ALL	Male	4	lung : Wagner Grade 1 <i>Comment:</i> Test: Chi-Squared - Pearson 2 Sided p < 0.001	ccc
ALL	Male	5	lung : Wagner Grade 1 <i>Comment:</i> Test: Chi-Squared - Pearson 2 Sided p < 0.001	ccc
ALL	Male	6	lung : Wagner Grade 1 <i>Comment:</i> Test: Chi-Squared - Pearson 2 Sided p < 0.001	ccc
ALL	Male	1	lung : Accumulation, Particle-Laden Macrophages, Balt <i>Comment:</i> Group Factor Chi-Squared & Fisher's Exact: Test: Chi-Squared p < 0.001	ccc
ALL	Male	4	lung : Accumulation, Particle-Laden Macrophages, Balt <i>Comment:</i> Test: Fisher's Exact 2 Sided p < 0.05	f
ALL	Male	5	lung : Accumulation, Particle-Laden Macrophages, Balt <i>Comment:</i> Test: Fisher's Exact 2 Sided p < 0.001	fff
ALL	Male	1	lung : Accumulation, Fibre-Laden Macrophages, Balt <i>Comment:</i> Group Factor Chi-Squared & Fisher's Exact: Test: Chi-Squared p < 0.001	ccc
ALL	Male	1	lung associated lymph nodes (ln) : Accumulation, Fibre-Laden Macrophages <i>Comment:</i> Group Factor Chi-Squared & Fisher's Exact: Test: Chi-Squared p < 0.001	ccc
ALL	Male	1	lung associated lymph nodes (ln) : Accumulation, Particle-Laden Macrophages <i>Comment:</i> Group Factor Chi-Squared & Fisher's Exact: Test: Chi-Squared p < 0.001	ccc

## Pathology - Intergroup Comparison of Pathology Observations

02G16015 - Subchronic (13 week) brake dust inhalation toxicology study  
(nose-only) with lifelong follow-up in the rat, 24 months post exposure - all

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Comments and Markers

Removal Reason	Sex	Group	Measurement	Marker
ALL	Male	4	lung associated lymph nodes (ln) : Accumulation, Particle-Laden Macrophages <i>Comment:</i> Test: Fisher's Exact 2 Sided p < 0.05	f
ALL	Male	5	lung associated lymph nodes (ln) : Accumulation, Particle-Laden Macrophages <i>Comment:</i> Test: Fisher's Exact 2 Sided p < 0.001	fff
ALL	Male	1	nasal cavity : subepithelial; Infiltration, Inflammatory Cell <i>Comment:</i> Group Factor Chi-Squared & Fisher's Exact: Test: Chi-Squared p < 0.05	c
ALL	Male	1	liver : Angiectasis <i>Comment:</i> Group Factor Chi-Squared & Fisher's Exact: Test: Chi-Squared p < 0.05	c
ALL	Male	1	liver : Cyst(S) <i>Comment:</i> Group Factor Chi-Squared & Fisher's Exact: Test: Chi-Squared p < 0.05	c
ALL	Male	1	liver : Infiltration, Mononuclear Cell <i>Comment:</i> Group Factor Chi-Squared & Fisher's Exact: Test: Chi-Squared p < 0.05	c
ALL	Male	1	thyroid gland : Adenoma, Follicular Cell; benign <i>Comment:</i> Group Factor Chi-Squared & Fisher's Exact: Test: Chi-Squared p < 0.01	cc
ALL	Male	1	seminal vesicles : Dilatation <i>Comment:</i> Group Factor Chi-Squared & Fisher's Exact: Test: Chi-Squared p < 0.05	c
ALL	Male	8	lung : alveolar/interstitial; Accumulation, Fibre-Laden Macrophages <i>Comment:</i> Test: Chi-Squared - Pearson 2 Sided p < 0.001	ccc
ALL	Male	9	lung : alveolar/interstitial; Accumulation, Fibre-Laden Macrophages <i>Comment:</i> Test: Chi-Squared - Pearson 2 Sided p < 0.001	ccc
ALL	Male	7	lung : alveolar/interstitial; Accumulation, Particle-Laden Macrophages <i>Comment:</i> Test: Chi-Squared - Pearson 2 Sided p < 0.001	ccc

## Pathology - Intergroup Comparison of Pathology Observations

02G16015 - Subchronic (13 week) brake dust inhalation toxicology study  
(nose-only) with lifelong follow-up in the rat, 24 months post exposure - all

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Comments and Markers

Removal Reason	Sex	Group	Measurement	Marker
ALL	Male	8	lung : interstitial; Fibrosis <i>Comment:</i> Test: Chi-Squared - Pearson 2 Sided p < 0.001	ccc
ALL	Male	9	lung : interstitial; Fibrosis <i>Comment:</i> Test: Chi-Squared - Pearson 2 Sided p < 0.001	ccc
ALL	Male	8	lung : Giant Cells, Syncytial <i>Comment:</i> Test: Chi-Squared - Pearson 2 Sided p < 0.001	ccc
ALL	Male	9	lung : Giant Cells, Syncytial <i>Comment:</i> Test: Chi-Squared - Pearson 2 Sided p < 0.001	ccc
ALL	Male	7	lung : Hyperplasia, Bronchiolo-Alveolar <i>Comment:</i> Test: Chi-Squared - Pearson 2 Sided p < 0.001	ccc
ALL	Male	8	lung : Hyperplasia, Bronchiolo-Alveolar <i>Comment:</i> Test: Chi-Squared - Pearson 2 Sided p < 0.001	ccc
ALL	Male	9	lung : Hyperplasia, Bronchiolo-Alveolar <i>Comment:</i> Test: Chi-Squared - Pearson 2 Sided p < 0.001	ccc
ALL	Male	8	lung : peribronchiolar; Infiltration, Inflammatory Cell <i>Comment:</i> Test: Fisher's Exact 2 Sided p < 0.001	fff
ALL	Male	9	lung : peribronchiolar; Infiltration, Inflammatory Cell <i>Comment:</i> Test: Fisher's Exact 2 Sided p < 0.001	fff
ALL	Male	8	lung : perivascular; Infiltration, Inflammatory Cell <i>Comment:</i> Test: Fisher's Exact 2 Sided p < 0.001	fff
ALL	Male	9	lung : perivascular; Infiltration, Inflammatory Cell <i>Comment:</i> Test: Fisher's Exact 2 Sided p < 0.001	fff

## Pathology - Intergroup Comparison of Pathology Observations

02G16015 - Subchronic (13 week) brake dust inhalation toxicology study  
(nose-only) with lifelong follow-up in the rat, 24 months post exposure - all

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Comments and Markers

Removal Reason	Sex	Group	Measurement	Marker
ALL	Male	8	lung : alveolar/interstitial; Infiltration, Inflammatory Cell <i>Comment:</i> Test: Chi-Squared - Pearson 2 Sided p < 0.001	ccc
ALL	Male	9	lung : alveolar/interstitial; Infiltration, Inflammatory Cell <i>Comment:</i> Test: Chi-Squared - Pearson 2 Sided p < 0.001	ccc
ALL	Male	8	lung : interstitial; Infiltration, Mononuclear Cell <i>Comment:</i> Test: Chi-Squared - Pearson 2 Sided p < 0.01	cc
ALL	Male	8	lung : Inflammation, Chronic <i>Comment:</i> Test: Chi-Squared - Pearson 2 Sided p < 0.01	cc
ALL	Male	9	lung : Inflammation, Chronic <i>Comment:</i> Test: Chi-Squared - Pearson 2 Sided p < 0.01	cc
ALL	Male	8	lung : Macrophage Aggregation, Alveolar <i>Comment:</i> Test: Chi-Squared - Pearson 2 Sided p < 0.01	cc
ALL	Male	9	lung : Macrophage Aggregation, Alveolar <i>Comment:</i> Test: Chi-Squared - Pearson 2 Sided p < 0.001	ccc
ALL	Male	8	lung : Microgranuloma <i>Comment:</i> Test: Chi-Squared - Pearson 2 Sided p < 0.001	ccc
ALL	Male	9	lung : Microgranuloma <i>Comment:</i> Test: Chi-Squared - Pearson 2 Sided p < 0.001	ccc
ALL	Male	7	lung : Wagner Grade 2 <i>Comment:</i> Test: Chi-Squared - Pearson 2 Sided p < 0.001	ccc
ALL	Male	7	lung : Wagner Grade 3 <i>Comment:</i> Test: Fisher's Exact 2 Sided p < 0.001	fff

## Pathology - Intergroup Comparison of Pathology Observations

02G16015 - Subchronic (13 week) brake dust inhalation toxicology study  
(nose-only) with lifelong follow-up in the rat, 24 months post exposure - all

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Comments and Markers

Removal Reason	Sex	Group	Measurement	Marker
ALL	Male	8	lung : Wagner Grade 4 <i>Comment:</i> Test: Chi-Squared - Pearson 2 Sided p < 0.001	ccc
ALL	Male	9	lung : Wagner Grade 4 <i>Comment:</i> Test: Chi-Squared - Pearson 2 Sided p < 0.001	ccc
ALL	Male	7	lung : Wagner Grade 1 <i>Comment:</i> Test: Chi-Squared - Pearson 2 Sided p < 0.001	ccc
ALL	Male	8	lung : Wagner Grade 1 <i>Comment:</i> Test: Chi-Squared - Pearson 2 Sided p < 0.001	ccc
ALL	Male	9	lung : Wagner Grade 1 <i>Comment:</i> Test: Chi-Squared - Pearson 2 Sided p < 0.001	ccc
ALL	Male	8	lung associated lymph nodes (laln) : Accumulation, Fibre-Laden Macrophages <i>Comment:</i> Test: Fisher's Exact 2 Sided p < 0.001	fff
ALL	Male	9	lung associated lymph nodes (laln) : Accumulation, Fibre-Laden Macrophages <i>Comment:</i> Test: Fisher's Exact 2 Sided p < 0.001	fff
ALL	Male	7	lung associated lymph nodes (laln) : Accumulation, Particle-Laden Macrophages <i>Comment:</i> Test: Fisher's Exact 2 Sided p < 0.05	f
ALL	Male	8	liver : Angiectasis <i>Comment:</i> Test: Fisher's Exact 2 Sided p < 0.05	f
ALL	Male	7	liver : Infiltration, Mononuclear Cell <i>Comment:</i> Test: Fisher's Exact 2 Sided p < 0.05	f

## Pathology - Intergroup Comparison of Pathology Observations

02G16015 - Subchronic (13 week) brake dust inhalation toxicology study  
(nose-only) with lifelong follow-up in the rat, 24 months post exposure - all

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Key Page**Measurement/Statistics**

<u>Measurement</u>	<u>Descriptive</u>	<u>Comparative</u>	<u>Arithmetic/Adjusted</u>	<u>Transformation</u>
Pathology Observation	Count Positives	Chi-Squared & Fisher's Exact		

**Group Information**

<u>Short Name</u>	<u>Long Name</u>	<u>Report Headings</u>	
1	Clean air	Clean air	control
2	brake dust low	brake dust	low
3	brake dust mid	Brake dust	mid
4	brake dust high	Brake dust	high
5	Particel Control	Titanium-	dioxide
6	Chrysotile low	Chrysotile	low
7	Chrysotile high	Chrysotile	high
8	Crocidolite	Crocido-	lite
9	Amosite	Amosite	

**Removal Reason Grouping**

<u>Grouping Name</u>	<u>Abbreviation</u>	<u>Removal Reasons</u>
Killed - Terminal Kill	TeKi	Killed - Terminal Kill
Killed - Moribund	US	Killed - Moribund
Found Dead	FD	Found Dead

Pathology - Intergroup Comparison of Pathology Observations

02G16015 - Subchronic (13 week) brake dust inhalation toxicology study  
(nose-only) with lifelong follow-up in the rat, 24 months post exposure - all

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