

Patch testing, 3rd Edition: Update 2008 – 2010

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This is an addendum to and an update of *Patch Testing, 3rd Edition* (ISBN 978-90-813233-1-4). It contains relevant information on *new allergens*, mostly chemicals described as contact allergens after publication of the book. The data presented here has been published in *Contact Dermatitis*, *Dermatitis* (the two journals largely devoted to the subject of contact dermatitis) or in any major dermatological journal from March, 2008 through December, 2010. Also, *updated information* on a number of contact allergens already mentioned in *Patch Testing* is provided, notably new test concentrations and/or vehicles, modifications of advice previously given or other data such as newly reported photosensitivity or contact urticarial reactions. For the updated allergens, only the new information is given; it is recommended to assess the data in conjunction with the corresponding entries in Table 1 of *Patch Testing, 3rd Edition*.

The table below provides an alphabetical listing of 86 individual chemicals or compounds and 33 synonyms for new and updated allergens. Of these, 64 chemicals refer to NEW allergens. The table has 6 vertical columns, which contain the following information:

- 1: Name of the chemical
- 2: Synonyms/other names
- 3: Patch test concentrations & vehicles, and reference numbers
- 4: Merck Index number
- 5: Cosmetic Ingredient Dictionary and Handbook monograph
- 6: Comments

Column 1: Name of the chemical

This column lists all chemicals, both "preferred names" and "synonyms/other names" alphabetically. To help in finding the chemical name, prefixes such as numbers, p-, m-, DL-, sym-, tert-, alpha-, et cetera have been placed *after* the name itself. "Preferred names" begin with a capital letter. "Other names/synonyms" are not capitalized, unless they are trade names (recognizable by ®), abbreviations, official plant names or they begin with the name of a country, city, or a proper name. INCI = International Nomenclature Cosmetic Ingredient (<http://ec.europa.eu/consumers/cosmetics/cosing/>)

Column 2: Synonyms/other names

This column may list one or more synonyms when the corresponding chemical in column 1 is a "preferred name", or refers to the "preferred name" when the corresponding chemical in Column 1 is a synonym ('See').

Column 3: Patch test concentrations & vehicles, and reference numbers

This column provides for each chemical ("preferred name") in Column 1 concentrations and vehicles for patch testing as recommended by the authors of articles referenced (references in brackets).

alc = alcohol; aqua = water; pet = petrolatum

Column 4: Merck Index number

A number in this column means that the corresponding chemical in Column 1 is monographed in the Merck Index (14th Edition, 2006), the number corresponding to the chemical's Merck Index monograph number.

Column 5: Cosmetic Ingredient Dictionary and Handbook Monograph

A "+" in this column means that the corresponding chemical in Column 1 is monographed in the CTFA Cosmetic Ingredient Dictionary and Handbook (11th Edition, 2006).

Column 6: Comments

This column contains a variety of information, all of which relates more or less directly to patch testing procedures (e.g. "test concentration may be irritant", "20 controls were negative", "no controls mentioned", "risk of patch test sensitization" etc.). When a chemical has caused photosensitivity, immediate contact reactions (contact urticaria) or patch test sensitization, relevant information and references are given under this heading.

In this column is it also indicated whether the entry is a new contact allergen, not previously shown in *Patch Testing*, 3rd Edition ("NEW") or whether it contains updated information on patch test data ("UPDATE PT"). CAS = CAS Registry Number.

Table 1 update 2008-2010: Chemicals

NAME	2: SYNONYMS / OTHER NAMES	3: TEST CONC. & VEH./ REFERENCE	4	5	6: COMMENTS
Acetamidocaproic acid (INCI)	acexamic acid; acetyl-aminocaproic acid 6-	5%-10% pet (59)	45	+	NEW. CAS 57-08-9. Ten controls were negative
acetyl-aminocaproic acid 6-	See Acetamidocaproic acid				
acexamic acid	See Acetamidocaproic acid				
acid blue 158	See Chromate(1-), (3-hydroxy-4-(2-(1-hydroxy-8-sulfo-2-naphthalenyl)diazonyl)-1-naphthalenesulfonato(4-))-, sodium (1:1)				
Alclofenac		2% pet (60)			Photosensitivity: ref 60
alkyl rhamnoside-C5	See Pentyl 6-deoxy-L-monopyranoside				
allyloxy-1,2-benzisothiazole 1,1-dioxide 3-	See Probenazole				
Aluminium chloride hexahydrate		10% pet (47)	337		UPDATE PT. The commonly used 2% preparation may result in false-negative reactions
Ambroxol hydrochloride		Commercial drug 10% pet (34)	386		<i>Photocontact allergy</i>
amino-o-cresol 5-	See Amino-2-hydroxytoluene 4-				

NAME	2: SYNONYMS / OTHER NAMES	3: TEST CONC. & VEH./ REFERENCE	4	5	6: COMMENTS
amino-2-hydroxy-1-methylbenzene 4-	See Amino-2-hydroxytoluene 4-				
Amino-2-hydroxytoluene 4- (INCI)	amino-o-cresol 5-; amino-2-hydroxy-1-methylbenzene 4-	1% pet (35)		+	NEW. CAS 2835-95-2
Anacardium occidentale	cashew nut shell oil	0.03%-0.3%-3% alc (54)	6781	+	UPDATE PT
Apomorphine hydrochloride		5%-10% pet (5)	746		UPDATE PT. Twenty controls were negative to 10% pet
asymmetrical hexamethylene 1,6-diisocyanate trimer	See Hexamethylene 1,6-diisocyanate trimer, asymmetrical				
Azithromycine		20% pet (65)			UPDATE PT. Ten controls were negative. Lower concentrations may result in false-negative reactions (65)
Beryllium chloride			1184		UPDATE PT. The previously suggested test concentration of 1% pet may result in patch test sensitization (48)
Bromomethyl(benzoic acid) 4-(0.01%-0.1%-1% pet (58)			NEW. CAS 6332-88-8. Ten controls were negative to 1% pet
Buprenorphine		0.001%-0.002% pet (57); transdermal delivery system + system without active drug; commercial injection preparation 0.3 mg/ml in water (41,57)	1497		NEW. CAS 52485-79-7. Contact allergy sometimes diagnosed <i>per exclusionem</i> (41)
butenedioic acid, dimethyl ester 2-	See Dimethyl maleate				
Carboxymethylcellulose sodium		10% vehicle? (56)	1829	+	UPDATE PT. Ten controls were negative
Carprofen		1% pet (2)			UPDATE PT. Photosensitivity: refs 2 and 67. Photopatch test sensitization at 2% and 5% pet: ref 67
Carvedilol		10% pet (26)	1873		NEW. CAS 72956-09-3. Ten controls were negative
Chlorendic anhydride					CAS 115-27-5. Contact urticaria: ref 30
Chloroacetamide					Patch test sensitization to 0.2%: ref 37

NAME	2: SYNONYMS / OTHER NAMES	3: TEST CONC. & VEH./ REFERENCE	4	5	6: COMMENTS
Chloropyridazin-3-amine 6-		0.5% alc (31)			NEW. CAS 5469-69-2. No controls performed
Chromate(1-), (3-hydroxy-4-(2-(1-hydroxy-8-sulfo-2-naphthalenyl)diazenyl)-1-naphthalenesulfonato(4-))-, sodium (1:1)	C.I. acid blue 158 (not a synonym, name used by the authors)	1% pet (49)			NEW. CAS 70942-15-3. Neither the structural formula, nor the CAS number, nor the molecular formula shown in the article correspond to the chemical known as Acid blue 158 (CAS 6370-08-7)
C.I. acid blue 158	See Chromate(1-), (3-hydroxy-4-(2-(1-hydroxy-8-sulfo-2-naphthalenyl)diazenyl)-1-naphthalenesulfonato(4-))-, sodium (1:1)				
Cobalt 2-ethylhexanoate	hexanoic acid, 2-ethyl-, cobalt salt (1:?) ethylhexanoic acid, cobalt salt 2-	1.3% pet (3)			NEW. CAS 13586-82-8. Twenty-four controls were negative.
Cyano-1-methylethyl)-dodecylethylsulfonium tetrafluoroborate(1-) (2-		10% and 5% pet (4)			NEW. CAS 72140-65-9. Two controls were negative
Desloratadine		1% pet (64)	2922		NEW. CAS 100643-71-8. Desloratadine 10% pet causes irritant reactions
Desmodur® N3200	See hexamethylene 1,6-diisocyanate biuret				
Desmodur® N3300	See hexamethylene 1,6-diisocyanate isocyanurate				
Desmodur® N3390BA	See hexamethylene 1,6-diisocyanate isocyanurate				
Desmodur® N3900	See Hexamethylene 1,6-diisocyanate trimer, asymmetrical				
Diacetyl-para-phenylenediamine N,N'-		1% pet (55)			NEW. Probably cross-reaction to p-Phenylenediamine
Dibromoimidazo[1,2-a]pyrazine 6,8-		1%, 0.1% and 0.01% alc (31)			NEW. CAS 63744-22-9. Seven controls were negative to the lowest concentration
didecyldimethylammonium chloride	See Didecyldimonium chloride				
Didecyldimonium chloride (INCI)	didecyldimethylammonium chloride	0.01% aqua	3099	+	NEW. CAS 7173-51-5. Contact urticaria: ref 51

NAME	2: SYNONYMS / OTHER NAMES	3: TEST CONC. & VEH./ REFERENCE	4	5	6: COMMENTS
Didecylmethylpoly(oxy ethyl) ammonium propionate					CAS 94667-33-1. Contact urticaria: ref 29
Diethyl fumarate		0.12% w/w pet (11)			NEW. CAS 623-91-6
Diethyl maleate (INCI)		0.12% w/w pet (11)			NEW. CAS 141-05-9
Diisostearyl malate (INCI)		40% pet (31)		+	NEW. CAS 67763-18-2. Three controls were negative
Dimethyl fumarate		0.01% w/w pet (11) and 0.1% pet (19)			NEW. CAS 624-49-7. 0.1% sometimes results in too strong reactions, but identifies additional cases of sensitization (19). Contact urticaria: ref 19.
Dimethyl maleate (INCI)	butenedioic acid, dimethyl ester 2-	0.1% w/w pet (11)		+	NEW. CAS 624-48-6
Dimethyl sulfate		0.1% pet (33)	3256		NEW. CAS 77-78-1. Two controls were negative
Dipentaerythritol fatty acid ester		1% pet (52)			NEW. CAS 208126-52-7. Five controls were negative
Diphenylphenol		2% pet (62)			Photosensitivity: ref 62
Donepezil			3419		Contact urticaria: ref 24
Drometrizole trisiloxane		5% pet (50)		+	Photocontact allergy: ref 50
ethoxylated ethyl-4-aminobenzoate	See PEG-25 PABA				
Ethyl 6-chloroimidazo[1,2-b]pyridazine-2-carboxylate		0.5% alc (31)			NEW. CAS 64067-99-8. No controls performed
ethylhexanoic acid, cobalt salt 2-	See Cobalt 2-ethylhexanoate				
Flumoxonide		0.1% alc (23)			NEW. CAS 60135-22-0
Flunisolide		0.1% alc (23)	4145		NEW. CAS 3385-03-3
Fragrance mix I					Patch test sensitization: ref 68
Glucan oligosaccharide		1% and 5% aqua (28)			NEW. CAS 9074-78-6. Seven controls were negative

NAME	2: SYNONYMS / OTHER NAMES	3: TEST CONC. & VEH./ REFERENCE	4	5	6: COMMENTS
HC Blue no. 7 (INCI)	methoxy-2-methylamino-3-aminopyridine 6-; methoxy-N2-methylpyridine-2,3-diamine dihydrochloride 6-	1% pet (32)		+	NEW. CAS 83732-72-3. Of 54 controls, 49 were negative and 5 had an irritant reaction
herniarin	See Methoxycoumarin 7-				
Hexamethylene 1,6-diisocyanate biuret	Desmodur [®] N3200	Desmodur [®] N3200 5% pet (1)			NEW. Five controls were negative
Hexamethylene 1,6-diisocyanate isocyanurate	Desmodur [®] N3390BA Desmodur [®] N3300	Desmodur [®] product 5% pet (1)			NEW. Nine controls were negative to 1% and 2%
Hexamethylene 1,6-diisocyanate trimer, asymmetrical	Desmodur [®] N3900	Desmodur [®] N3900 5% pet (1)			NEW. Twenty controls were negative
hexanoic acid, 2-ethyl-, cobalt salt (1:?)	See Cobalt 2-ethyl-hexanoate				
Hexyldecanol (INCI)		10% pet (46)		+	NEW. CAS 2425-77-6. Three controls were negative
(2-hydroxyethoxy)-phenyl-(2-hydroxy-2-methyl-propyl)ketone 4- (?)	See Hydroxy-1-(4-(2-hydroxyethoxy)-phenyl)-2-methyl-1-propanone 2-				
Hydroxy-1-(4-(2-hydroxyethoxy)phenyl)-2-methyl-1-propanone 2-	Darocur [®] 2959; (2-hydroxyethoxy)-phenyl-(2-hydroxy-2-methyl-propyl)ketone 4- (?)	1% pet (10)			NEW. CAS 106797-53-9. Twenty controls were negative. The name used by the authors (second synonym) could not be found in chemical databases
Iomeprol		1%-5% aqua (45)	5054		NEW. CAS 78649-41-9. Five controls were negative to iomeprol 5% aqua
Isononyl isononanoate (INCI)		5% alc (43)		+	NEW. CAS 59219-71-5. Twenty controls were negative
isopropenyl-1-methyl-2-cyclohexene-1-hydroperoxide (4R)-4-	See Limonene-1-hydroperoxide				
isopropenyl-2-methyl-2-cyclohexene-1-hydroperoxide (5R)-5-	See Limonene-2-hydroperoxide				
Limonene-1-hydroperoxide	isopropenyl-1-methyl-2-cyclohexene-1-hydroperoxide (4R)-4-	0.75%-1% pet (40)			NEW. Present in oxidized limonene. Unstable
Limonene-2-hydroperoxide	isopropenyl-2-methyl-2-cyclohexene-1-hydroperoxide (5R)-5-	0.75%-1% pet (40)			NEW. Present in oxidized limonene
Limonene, oxidized		3% pet (40)			NEW

NAME	2: SYNONYMS / OTHER NAMES	3: TEST CONC. & VEH./ REFERENCE	4	5	6: COMMENTS
Linalool		Oxidized linalool 6% pet (14)	5495	+	UPDATE PT. CAS 78-70-6
Lorazepam		Crushed tablet, 30% pet (8)	5579		NEW. CAS 846-49-1
margosa oil	See Melia azadirachta seed oil				
Mazipredone		0.1% alc (23)	5763		NEW. CAS 13085-08-0
Melia azadirachta seed oil (INCI)	neem oil; margosa oil	Pure (63)	6437	+	NEW. CAS 8002-65-1. No controls performed
Methoxsalen	methoxypsoralen 8-		5988		Photosensitivity: ref 7
Methoxycoumarin 7- (INCI)	herniarin	1% pet (6)			NEW. CAS 531-59-9
methoxy-2-methylamino-3-aminopyridine 6-	See HC Blue no. 7				
methoxy-N2-methylpyridine-2,3-diamine dihydrochloride 6-	See HC Blue no. 7				
methoxypsoralen 8-	See Methoxsalen				
Methyl heptine carbonate	methyl 2-octynoate	<1% pet (12)			UPDATE PT. The 1% test preparation (TROLAB) may induce active sensitization
methyl 2-octynoate	See Methyl heptine carbonate				
Methyl-2-pyrrolidone N- + poly DL-lactic-co-glycolic acid		Undiluted (18)			NEW. Five controls were negative. Drug eruption with positive patch test
Misoprostol		1% pet (21)			NEW. CAS 59122-46-2. Drug eruption with positive patch test
Mono(2-ethylhexyl)-maleate		1% pet (38)			NEW. CAS 7423-42-9. Twenty-one controls were negative
Naphazoline hydrochloride		1% pet (27)	6368		NEW. CAS 835-31-4. Twenty controls were negative
neem oil	See Melia azadirachta seed oil				
Niflumonic acid	niflumic acid	5% pet (60)	6531		NEW. CAS 4394-00-7
Octadecenylpropane-1,3-diamine (Z)-N-9-	oleyl-1,3-propylene diamine N-	0.5% pet (36)			NEW. CAS 7173-62-8. No controls performed
Olanzapine		1% pet (13)	6822		NEW. CAS 132539-06-1. Ten controls negative

NAME	2: SYNONYMS / OTHER NAMES	3: TEST CONC. & VEH./ REFERENCE	4	5	6: COMMENTS
oleyl-1,3-propylene diamine N-	See Octadecenylpropa- ne-1,3-diamine (Z)-N-9-				
PEG-25 PABA (INCI)	polyethylene glycol (25) PABA; ethoxylated ethyl-4-aminobenzoate	no test concentrations mentioned (50); suggested patch test concentration: 10% pet		+	NEW. CAS 116242-27-4. Photocontact allergy: ref 50
Pelargonyl vanillyla- mide					Contact urticaria: ref 66
Pentyl 6-deoxy-L- monopyranoside	pentyl rhamnoside; alkyl rhamnoside-C5	1% aqua (17)			NEW. CAS 494844-0. Five controls were negative
pentyl rhamnoside	See Pentyl 6-deoxy-L- monopyranoside				
Petrolatum					Photosensitivity: ref 62
Phenytoin		5% and 10% pet (15)	7322		NEW. CAS 57-41-0. Fifty controls were negative. Positive patch test in patients with drug hypersensitivity syndrome (DRESS)
Phytantriol (INCI)	tetramethyl-1,2,3- hexadecanetriol 3,7,11,15-	0.02%-0.2%-0.5% pet (44)	7386	+	NEW. CAS 74563-64-7
phytonadione epoxide	See Vitamin K1 oxide				
polyethylene glycol (25) PABA	See PEG-25 PABA				
Polyglyceryl-4 laurate (INCI)		1% and 0.5% aqua (61)		+	NEW. CAS 75798-42-4. Seven controls were negative. Possibly cross- reaction to Polyglyceryl- 10 laurate
Polyglyceryl-6 laurate (INCI)		1% and 0.5% aqua (61)		+	NEW. CAS 51033-38-6. Seven controls were negative. Possibly cross- reaction to Polyglyceryl- 10 laurate
Polyglyceryl-10 laurate (INCI)		1% and 0.5% aqua (61)		+	NEW. CAS 34406-66-1. Seven controls were negative.
Poly DL-lactic-co- glycolic acid + methyl- 2-pyrrolidone N-		Undiluted (18)			NEW. Five controls were negative. Drug eruption with positive patch test
Polyolefin ester		0.1% and 1% pet (39)			NEW. Exact chemical identity unknown, possibly polyisobutene succinic ester. Twenty controls were negative

NAME	2: SYNONYMS / OTHER NAMES	3: TEST CONC. & VEH./ REFERENCE	4	5	6: COMMENTS
Probenazole	allyloxy-1,2-benzisothiazole 1,1-dioxide 3-	0.01% pet (16)			NEW. CAS 27605-76-1. Twenty controls were negative
Quinine chlorhydrate		30% pet (22)			NEW. CAS?? Virtually no information in chemical databases on this compound
Ratapamulin		Ratapamulin ointment undiluted (25)			Active ingredient not tested; the ointment base was composed of white petrolatum only (?)
Ropivacaine		1% pet (53)	8258		NEW. CAS 84057-95-4. Probably cross-reaction in this case
tetramethyl-1,2,3-hexadecanetriol 3,7,11,15-	See Phytantriol				
Topiramate		Crushed tablet, 30% pet (15)	9547		NEW. CAS 97240-79-4. Seventeen controls were negative. Positive patch test in patients with drug hypersensitivity syndrome (DRESS)
Trifluoromethyl-4-nitrophenyl)phthalimide N-(3-		0.005% pet (42)			NEW. Twenty controls were negative
Trioleyl phosphate (INCI)		1% pet (43)		+	NEW. CAS 3305-68-8. Twenty controls were negative
Valiya narayana thailam ayurvedic oil		Undiluted (20)			NEW. Ten controls were negative. Base oil with material from 48 plants
Vitamin K1 oxide	phytonadione epoxide (INCI); vitamin K1 epoxide	1% pet (9)	7380		NEW. CAS 25486-55-9
Zolpidem		Crushed tablet, 30% pet (8); 10% pet (26)	10190		NEW. CAS 82626-48-0. Ten controls were negative (26)

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