

Rules for Naming Single-Compound Fluorocarbons

The first digit is one less than the number of Carbon atoms.

The second digit is one more than the number of Hydrogen atoms.

The third digit is the number of Fluorine atoms.

Any remaining locations are understood to be filled with Chlorine atoms, except compounds ending with B contain Bromine atoms; ...B2 has two Bromine atoms, etc.

Lower-case suffixes represent progressively unbalanced structures.

For example: R 142b is CClF_2CH_3 , with a molecular weight of 100.5. The R 142 compounds are structured as follows:

R 142 would be

	H F	
	Cl – C – C – H	a relatively balanced structure.
49.5 AMU	H F	51 AMU

R 142a would be

	F H	
	Cl – C – C – F	an unbalanced (asymmetrical) structure.
67.5 AMU	H H	33 AMU

R 142b is

	F H	
	Cl – C – C – H	a further unbalance.
85.5 AMU	F H	15 AMU

The degree of imbalance is determined by the molecular weights of the end elements, as shown in the example above.



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Refrigerant Identification Guide

Single-Component Compounds

Name:	To [replace] or used as:	MW	Formula:
R 11		137	CCl_3F
R 12		121	CCl_2F_2
R 12B1	Extinguishant	164	CBrClF_2 Halon 1211
R 13		104	CClF_3
R 13B1	Extinguishant	148	CBrF_3 Halon 1301
R 14		88	CF_4
R 22		86	CHClF_2
R 23	[R 13, R 503]	70	CHF_3
R 32		52	CH_2F_2
R 50		16	CH_4 Methane
R 113		186	$\text{CClF}_2\text{CCl}_2\text{F}$
R 114		170	$\text{CClF}_2\text{CClF}_2$
R 115		154	CClF_2CF_3
R 116		138	C_2F_6
R 123	[R 11]Extinguishant, Propellant	153	CHCl_2CF_3
R 124	[R 114] Foam Blower	136	$\text{CHClF}_2\text{CF}_3$
R 125	[R 502]	120	CHF_2CF_3
R 134a	[R 12]	102	CF_3CHF
R 141b	Foam Blower	117	CCl_2FCH_3
R 142b	[R 12 in foam]	100	CClF_2CH_3
R 143a		84	CF_3CH_3
R 152a	Foam Blower; Extinguishant	66	CHF_2CH_3
R 218		188	C_3F_8
R 227	[Halon1301, 1211]	170	$\text{CF}_3\text{CFHCF}_3$
R 245fa	[R 141b] Foam Blower	133	$\text{CF}_3\text{CH}_2\text{CF}_2\text{H}$
R 290		44	C_3H_8 Propane
RC 318		200	C_4F_8 Perfluorocyclobutane
R 600a		58	$\text{CH}_3\text{CH}(\text{CH}_3)_2$ Iso-Butane
R 717	Large Commercial Units	17	NH_3 Ammonia
R 718	Chillers	18	H_2O Water



Blended Compounds

(Suffixes relate to different percentage mixes)

ASHRAE Nomenclature

Name:	To [replace]:	Comprised of:	Percentages:	Cross-reference (respective)
R 401A	[R 12]	R22/R152a/R124	53/13/34	MP 39
R 401B	[R 500, R 12]	R22/R152a/R124	61/11/28	MP 66
R 401C		R22/R152a/R124	33/15/52	MP 52
R 402A	[R 502]	R22/R125/R290	38/60/2	HP 80
R 402B	[R 502]	R22/R125/R290	60/38/2	HP 81
R 403B		R22/R218/R290	56/39/5	
R 404A	[R 502]	R125/R143a/R134a	44/52/4	HP 62
R 405A		R22/R152a/R142b/RC318	45/7/5.5/42.5	
R 406A		R22/R600a/R142b	55/4/41	
R 407A	[R 22]	R32/R125/R134a	20/40/40	Klea 60
R 407B	[R 22]	R32/R125/R134a	10/70/20	
R 407C	[R 22]	R32/R125/R134a	23/25/52	Suva 9000
R 407D	[R 22]	R32/R125/R134a	15/15/70	
R 407E	[R 22]	R32/R125/R134a	25/15/60	
R 408A	[R 502]	R125/R143a/R22	7/46/47	FX 10
R 409A	[R 12]	R22/R124/R142b	60/25/15	FX 56
R 409B		R22/R124/R142b	65/25/10	
R 410A	[R 22]	R32/R125	50/50	AZ 20
R 411A		R1270/R22/R152a	1.5/87.5/11	
R 411B		R1270/R22/R152a	3/94/3	
R 411C		R1270/R22/R152a	3/95.5/1.5	
R 412A		R22/R218/R142b	70/5/25	
R 413A		R218/R134a/R600	9/88/3	
R 414A		R22/R124/R600a/R142b	51/28.5/4/16.5	
R 414B	[R 12]	R22/R124/R600a/R142b	50/39/1.5/9.5	
R 416A	[R 12]	R134a/R124/R600	59/39.5/1.5	FR 12
R 417		R125/R134a/R600	46/50/4	
R 500		R12/R152a		
R 502		R22/R115	48.8/51.2	
R 503		R23/R13	40/60	
R 507	[R 502]	R125/R143a	50/50	AZ 50
R 508A	[R 503,R 13]	R23/R116	39/61	
R 508B	[R 13,R 23,R 116]	R23/R116	46/54	Suva 95
R 509A	[R 22,R 218]		44/56	

Blended Compounds (cont'd)

Proprietary names:

Name:	To [replace]:	Comprised of:	Percentages:	Cross-reference (respective)
AZ 20	[R 22]	R32/R125	50/50	R410A
AZ 50	[R 502]	R125/R143a	50/50	R507
DI 36	[R 12]	R22/R124/R600	50/47/3	
DI 44	[R 502]	R22/R125/R143a/R290	50/42/6/2	
FR 12	[R 12]	R134a/R124/R600	59/39.5/1.5	R416A
FX 10	[R 502]	R125/R143a/R22	7/46/47	R408A
FX 56	[R 12]	R22/R124/R142b	60/25/15	R409A
FX 70	[R 502]	R143a/R125/R134a		
Klea 60	[R 502]	R32/R125/R134a	20/40/40	R407A
MP 39	[R 12]	R22/R152a/R124	53/13/34	R401A
MP 66	[R 500]	R22/R152a/R124	61/11/28	R401B
HP 62	[R 502]	R125/R143a/R134a	44/52/4	R404A
HP 80	[R 502]	R22/R125/R600	38/60/2	R402A
HP 81	[R 502]	R22/R125/R600	60/38/2	R402B

Holders of proprietary names:

AZ:	Allied Signal
DI:	Montedison (Ausimont)
FR:	Intermagnetics General
FX:	Elf Atochem
HP:	Allied Signal; DuPont
Klea:	ICI
MP:	Allied Signal; DuPont
Suva	DuPont