

List of abbreviations

Acronym	Explanation
3F	Fluorine-free foam
4:2 FTMA	4:2 fluorotelomer methacrylate
4:2 FTO	fluorotelomer olefin
8:2 FTSA	8:2 fluorotelomer sulfonic acid
6:2 FTOH	6:2 fluorotelomer alcohol
6:2 FTSA	6:2 fluorotelomer sulfonic acid
7:3 FTCA	7:3 fluorotelomer carboxylic acid
8:2 CI-PFESA	8:2 CI-polyfluorinated ether sulfonate
8:2 PTrMeOSi	8:2 polyfluoroalkyl trimethoxysilane
9CI-PF3ONS	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid
ADME	Processes of absorption, distribution, metabolism, and excretion
ADONA	Ammonium 4,8-dioxa-3H-perfluorononanoate, 3H-perfluoro-3-[(3-methoxy-propoxy)propanoic acid]
AFFF	Aqueous Film-Forming Foam
ALT	Serum alanine transferase
AOF	Total adsorbable organic fluorine
AOP	Advanced oxidation process
AR	Androgen receptors
AR-AFFF	Alcohol Resistant-Aqueous Film Forming Foam
ARFF	Aircraft Rescue & Firefighting
AR-FFFP	Alcohol-Resistant Film-Forming Fluoro-Protein
ATSDR	Agency for Toxic Substances and Disease Registry
BAC	Biological activated carbon
BAF	Bioaccumulation potential
BAU	Business as usual
BCF	Bioconcentration Factor
BOD	Biological oxygen demand
BP	Biocidal products
C	Carcinogenicity
CAA	Civil Aviation Authority
CAF	Compressed air foam
CAR	Constitutive androstane receptor
CBT	Closed Bottle Test
C-E	Cost-effectiveness
CIC	Combustion ion chromatography
CMR	Carcinogenic, mutagenic or toxic for reproduction
COP	Conference of the Parties
CSS	Chemical Strategy for Sustainability
CTD	Characteristic Travel Distance
CTVs	Chronic toxicity values
DMW	Distribution ratios for membrane–water
DoD	Department of Defense
DONA	Dodecafluoro-3H-4,8-dioxanonanoic acid

DPW	Distribution ratios for protein–water
dw	Dry weight
DWD	Drinking Water Directive
EA	Endocrine Activity
ECHA	European Chemicals Agency
EC50	Half maximal effective concentration
ECOS	Environmental Coalition on Standards
ED	Endocrine Disruption
EEA	European Economic Area
EFSA	European Food Safety Authority
EOF	Extractable organic fluorine
EPAs	Environmental Protection Agencies
EQSD	Environmental Quality Standards Directive
ER	Estrogen receptors
EtFOSAA	N-Ethyl perfluorooctane sulfonamidoacetic acid
Eurofeu	European Committee of the Manufacturers of Fire Protection Equipment and Fire Fighting Vehicles
EUREAU	European Federation of National Associations of Water Services
EURITS	European Union for Responsible Treatment of Special Waste
F-53B	6:2 Cl-polyfluorinated ether sulfonate (6:2 Cl-PFESA)
FABPs	Fatty acid binding proteins
FASAs	Perfluoroalkane sulfonamides
FASEs	Perfluoroalkyl sulfonamidoethanols
FBG	Fasting blood glucose
FCCC	US association Fire Fighting Foam Coalition
FFFC	Fire Fighting Foam Coalition
FFFP	Fluoroprotein foam concentrates and film forming fluoro-protein
FHEA	Perfluorohexyl ethanoic acid
FI	Fasting insulin
FOSA	Perfluorooctane sulfonamide
FMV	Swedish Defence Materiel Administration
FP	Fluoro Protein
FPA Australia	Fire Protection Association Australia
FRV	Fire Rescue Victoria, Australia
FPAR	Fluoro-Protein Alcohol-Resistant
FTCA	Fluorotelomer carboxylic acid
FTIs	Fluorotelomer iodides
FTSAs	Fluorotelomer sulfonic acids
FTTAoSs	Fluorotelomer thioether amido sulfonates
FTUCA	Fluorotelomer unsaturated carboxylic acid
GAC	Granular activated carbon
GDP	Gross domestic product
GFK	Glass fiber reinforced composite material
GGMs	Gaussian graphical models
GHG	Greenhouse gas
GRP	Glass-fiber reinforced plastic

GWP	Global Warming Potential
HCFCs	Hydrochlorofluorocarbons
HDL	High-density lipoprotein
HDL-C	High-density lipoprotein cholesterol
HFCs	Hydrofluorocarbons
HFEs	Hydrofluoroethers
HFOs	Hydrofluoroolefins
HFP	Hexafluoropropene
HFPO-DA	Hexafluoropropylene oxide dimer acid, 2,3,3,3-tetrafluoro-2-(heptafluoropropoxy)propanoic acid, FRD-903, GenX
HPG	Hypothalamic–pituitary–gonadal
HPT	Hypothalamic–pituitary–thyroid
HWI	Hazardous waste incinerators
IBCs	Intermediate bulk containers
IC50	The concentration of drug required for 50% inhibition
ICAO	International Civil Aviation Organization
IED	Industrial Emissions Directive
IMO	International Maritime Organization
Intertanko	International Association of Independent Tanker Owners
IPEN	International Pollutants Elimination Network
IPCC	Intergovernmental Panel on Climate Change
ITRC	Interstate Technology and Regulatory Council
IX	Ion exchange
K _d	sediment/water distribution coefficients
kg	Kilogram
KEMI	Swedish Chemicals Agency
L	Lactation effects
LAST	Large atmospheric storage tank
LC	Lethal Concentration
LDL	Low-density lipoprotein
LDL-c	Low-density lipoprotein cholesterol
LfU	Bavarian State Ministry for the Environment and Consumer Protection
LOEC	Lowest observed effect concentration
LoQ	Limit of Quantification
LRT	Long-range transport
LRTP	Long Range Transport Potential
M	Mutagenicity
MAC Directive	Mobile Air-Conditioning Directive
MoD	Ministry of Defence
MetS	Metabolic syndrome
mg	Milligram
MFB	Victorian Metropolitan Fire and Emergency Services Board
MLB	Mobile extinguishing water treatment plant (DE)
MoA	Mode of Action
monoPAPs/diPAPs	Polyfluoroalkyl phosphoric acid mono-/diesters
MSFD	Marine Strategy Framework Directive

MWV	Mineralölwirtschaftsverband (German associations for Mineral oil Industry)
n:2 FTIs	n:2 Fluorotelomer iodides
NDAA	National Defence Authorization Act
NIVA	Norwegian Institute for Water Research
ng	Nanogram
NHANES	National Health and Nutrition Examination Survey
NK	Natural killer
NPS	Nano-sized particle fractionator
NPV	Net present value
NTCP	Na ⁺ /taurocholate co-transporting polypeptide
NTS	Non-destructive Testing System
OATs	Organic anion transporters
OATPs	Organic anion transporting polypeptides
OBS	Additional PFASs such as F-53B and p-perfluorous nonenoxybenzenesulfonate
OECD	Organisation for Economic Co-operation and Development
OF/AOF	Extractable/adsorbable organofluorine
PAC	Powdered activated carbon
PAHs	Poly aromatic Hydrocarbons
PAPs	Perfluoroalkyl phosphate esters
PASF	Perfluoroalkane sulfonyl fluoride substances
PBTk	Physiologically based toxicokinetic
PBT	Persistent, bioaccumulative and toxic
PCBs	Polychlorinated biphenyls
PCTFE	Polychlorotrifluoroethylene
PEC	Predicted Environmental Concentration
PEG	Polyethylene glycol
PFA	Perfluoroalkoxy polymer
PFAAs	Polyfluoroalkyl acids
PFAEs	Perfluoroalkylethers
PFASs	Per- and Polyfluoroalkyl Substances
PFBA	Perfluorobutanoic acid
PFBPA	Perfluorobutyl phosphonic acid
PFBS	Perfluorobutane Sulfonic acid
PFCAs	Perfluoroalkyl Carboxylic acid
PFDA	Perfluorodecanoic acid
PFDoDA	Perfluorododecanoic acid
PFECAs	Perfluoroalkylether carboxylic acids
PFECHS	Perfluoroalkane sulfonate
PFESAs	Perfluorooctyl phosphonic acid
PFHpA	perfluoroheptanoic acid
PFHxA	Perfluorohexanoic acid
PFHxS	Perfluorohexane sulfonic acid
PFMOBA	Perfluoro(4-methoxybutanoic) acid
PFNA	Perfluorononanoic acid
PFOA	Perfluorooctanoic acid

PFOPA	Perfluorooctyl phosphonic acid
PFOS	Perfluorooctane sulfonic acid
PFOSA	Perfluorooctanesulfonamide
PFPAs	Perfluoroalkyl phosphonic acids
PFPE	Perfluoropolyether
PFPIAs	Perfluoroalkyl phosphinic acids
PFTeDA	Perfluorotetradecanoic acid
PFTrDA	Per-fluorotridecanoic acid
PFSAs	Perfluoroalkane sulfonic acids
PFUnDA	Perfluoroundecanoic acid
PICs	Products of incomplete combustion
PMM	Perfluoro-N-methylmorpholine
PNEC	Predicted No Effect Concentration
POP	Persistent Organic Pollutants
POPRC	POP Review Committee
PPAR	Peroxisome proliferator activated receptors
ppb	Parts per billion
PPE	Personal protective equipment
ppm	Parts per million
PPP	Plant protection products
PTFE	Polytetrafluoroethylene
PXR	Pregnane X-receptor
QSAR	Quantitative structure–activity relationship
R	Reproductive toxicity
RAC	Committee for Risk Assessment
RCF	Root concentration factor
R&D	Research and Development
RISE	Research Institute of Sweden
RIVM	The National Institute for Public Health and the Environment NL
RMM	Risk management measure
RMO	Risk management option
RO	Restriction option
SDS	Safety data sheet
SEA	Socio-economic assessment
SEAC	Committee for Socio-economic Analysis
SFPs	Side-chain fluorinated polymers
SHB	Southern Hudson Bay
SPM	Suspended particulate matter
SS	Steady state
STOT RE	Specific target organ toxicity on repeated exposure
SVHC	Substances of Very High Concern
TBG	Thyroxine-binding-globulin
TC	Total cholesterol
TDAR	T-cell-dependent antibody responses
TERC	Toxicology & Environmental Research and Consulting, The Dow Chemical Company

TF	Total fluorine
TFA	Trifluoroacetic acid
TFE	Tetrafluoroethylene
TFMP	4-(trifluoromethyl)phenol
TG	Triglycerides
TMF	Trophic magnification factor
TRR	Total radioactive residue
TSCA	Toxic Substances Control Act (US)
TOC	Total organic carbon
TOF	Total fluorine
TOPA or TOP	Total oxidizable precursor
TTR	Thyroxine transport proteins transthyretin
TWI	Tolerable Weekly Intake
UBA	German Environment Agency
UNECE	United Nations Economic Commission for Europe
UNFCCC	United Nations Framework Convention on Climate Change
UNEP	United Nations Environment Programme
US EPA	U.S. Environmental Protection Agency
US NFPA	US National Fire Protection Agency
UWWTD	Urban Wastewater Treatment Directive
UTV	Unabhängige Tanklagerverband e.V. (German Independent tank farm association)
UV	Ultraviolet
vPvB	Very persistent and very bioaccumulative
VTG	Vitellogenin
WFBC	Woman Firefighting Biomonitoring Collaborative
WFD	Water Framework Directive
WFVD	Der Verband Bundesverband Betrieblicher Brandschutz (German Industrial Fire-Fighters Association)
WHB	Western Hudson Bay
ww	Wet weight
WWTP	Wastewater Treatment Plant