

Fluorocarbons

17 June 2020

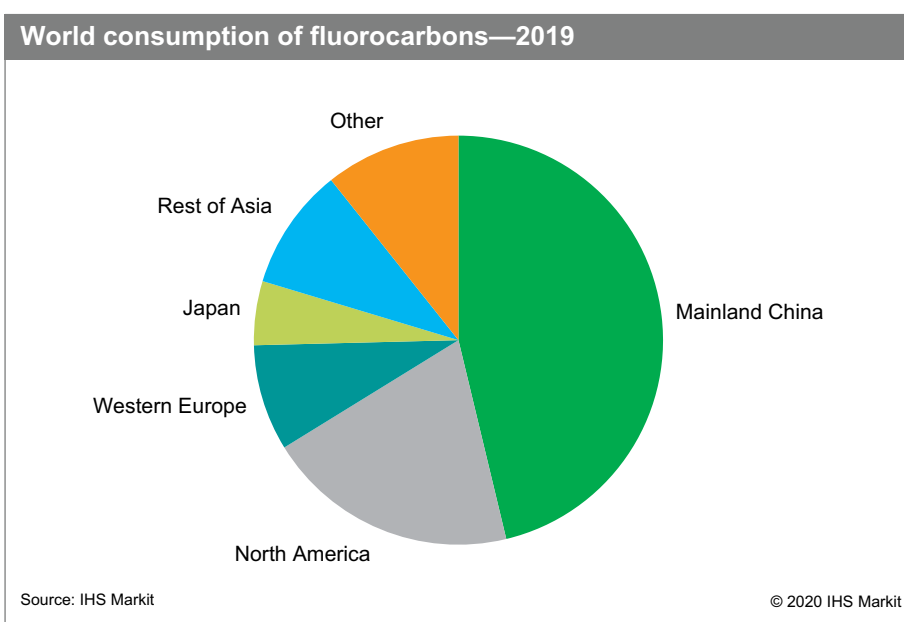
Abstract

Fluorocarbons analyzed in this report include fully halogenated chlorofluorocarbons (CFCs); hydrochlorofluorocarbons (HCFCs); hydrofluorocarbons (HFCs); and hydrofluoroolefins (HFOs). CFCs and HCFCs are recognized as ozone-depleting substances (ODS). HFCs, while not contributing to ozone depletion, are recognized as potent greenhouse gases with a global warming potential (GWP) many times that of carbon dioxide. The new generation HFOs are not recognized as ODS and have an extremely low GWP; consequently, they have seen rapid growth in consumption as replacements for traditional products in applications including air-conditioning systems, refrigerants, foam blowing agents, and aerosol propellants.

Global consumption of fluorocarbons will continue to grow at an average annual growth rate of 1.3% per year during 2019–25. Consumption of HFOs are expected to grow at an average annual rate of about 10.6%; consumption of HFCs will see a 3–6% increase in developing countries, and a 3–4% decline in the developed world, including Europe, the United States, and Japan. Mainland China and other Asia markets will expand their market shares while Europe, the United States, and Japan will see declines during the forecast period.

The outbreak of the coronavirus disease 2019 (COVID-19) pandemic in late 2019 and throughout 2020 will inevitably impact end-use markets that are tied to the fluorocarbons supply chain, including infrastructure, construction, automobiles, air conditioners, refrigerators, freezers, and home appliances. Demand for fluorocarbons through 2020 is estimated to contract by 10–15% compared with 2019.

The following pie chart shows world consumption of fluorocarbons in 2019:



Contacts

Maria deGuzman • Maria.deguzman@ihsmarkit.com

In marked contrast to other fluorocarbon segments, polymer precursors have shown strong growth since 1990. The use of fluorocarbons for solvent cleaning and flexible polyurethane foam, as well as the very large European aerosol market, was virtually eliminated in the 1990s during a transition to not-in-kind replacement processes and chemicals.

For more detailed information, see the table of contents, shown below.

IHS Markit's Chemical Economics Handbook – *Fluorocarbons* is the comprehensive and trusted guide for anyone seeking information on this industry. This latest report details global and regional information, including



Global summary;
regional coverage



Producers with
annual capacities
and plant sites



Production figures
and trends



Consumption and
forecasts by end use
application



Manufacturing
processes and
environmental issues



Trade – imports
and exports

Key benefits

IHS Markit's Chemical Economics Handbook – *Fluorocarbons* has been compiled using primary interviews with key suppliers and organizations, and leading representatives from the industry in combination with IHS Markit's unparalleled access to upstream and downstream market intelligence and expert insights into industry dynamics, trade, and economics.

This report can help you

- Identify trends and driving forces influencing chemical markets
- Forecast and plan for future demand
- Understand the impact of competing materials
- Identify and evaluate potential customers and competitors
- Evaluate producers
- Track changing prices and trade movements
- Analyze the impact of feedstocks, regulations, and other factors on chemical profitability

Contents

Executive summary	7
Summary	8
Industry structure and dynamics	14
Introduction and nomenclature	17
Environmental issues	23
Montreal Protocol and ozone depletion	23
Kyoto Protocol and global warming	24
Montreal Protocol and climate protection (Kigali Amendment)	26
United States	28
– EPA regulations	28
– New substitute for HFC-134a in motor vehicle air-conditioning	33
– Reclamation and reuse	33
European Union	34
Mainland China	37
– CFC phaseout	37
– HCFC phaseout	40
– HFC phasedown	41
Japan	42
Developing countries	44
Manufacturing processes	45
Supply and demand by region	48
North America	48
– Producing companies	48
– Salient statistics	49
– Consumption	50
– Refrigeration and air-conditioning	51
– Commercial and industrial refrigeration	58
– Stationary air-conditioning	59
– Mobile air-conditioning	60
– Household refrigerators and freezers	62
– Polymer precursors	62
– Fluoropolymers	64
– Fluoroelastomers	65
– Foam blowing agents	66
– Aerosol propellants	69
– Solvent cleaning	71
– Other	73
– Price	73
– Trade	74
– United States	74

– Canada	76
– Mexico	76
Central and South America	76
– Producing companies	76
– Salient statistics	77
– Consumption	78
– Trade	79
Europe	80
– Producing companies	80
– Salient statistics	82
– Production	82
– Consumption	82
– Polymer precursors	85
– Fluoropolymers	87
– Fluoroelastomers	88
– Refrigeration and air-conditioning	88
– Mobile air-conditioning	90
– Stationary air-conditioning systems	91
– Refrigeration	91
– Foam blowing agents	92
– Extruded polystyrene foam (XPS)	94
– Polyurethane boards	94
– Polyurethane flexible foams	94
– Polyurethane spray foams	94
– Appliances	94
– Aerosol propellants	95
– Solvent cleaning and other	96
– Price	97
– Trade	97
– Imports	97
– Exports	98
Other Europe and CIS	99
– Producing companies	99
– Salient statistics	100
– Consumption	100
– Trade	101
Middle East and Africa	102
– Consumption	103
– Trade	103
Indian Subcontinent	104
– Producing companies	104
– Salient statistics	105
– Consumption	106

Mainland China	107
– Producing companies	107
– Salient statistics	113
– HCFCs	114
– HFCs	116
– HFOs	117
– Consumption	117
– HCFCs by type	118
– HCFC-22	119
– HCFC-141b	119
– HCFC-142b	119
– HCFCs by market	119
– Polymer precursors	120
– Refrigeration and air-conditioning	122
– Foam blowing agents	122
– Solvent, aerosol, and other	123
– HFCs	123
– HCFC-142b/VDF conversion	125
– Refrigeration and air-conditioning	125
– Foam blowing agents	127
– Other	127
– HFOs	127
– Price	128
– Trade	129
Northeast Asia	131
– Producing companies	131
– Japan	133
– South Korea and Taiwan	134
– Salient statistics	134
– Production	135
– Consumption	137
– Japan	138
– Polymer precursors	141
– Refrigeration and air-conditioning	141
– Foam blowing agents	142
– Solvent cleaning	143
– Aerosol propellants	144
– Price	144
– Trade	145
– Imports	145
– Exports	146
Southeast Asia	146
– Salient statistics	147

– Consumption	147
– Trade	148
Appendix I—Ozone depletion and fluorocarbons	149
Appendix II—Global warming and fluorocarbons	151
Additional resources	153
Revisions	154

IHS Markit Customer Care

CustomerCare@ihsmarkit.com

Americas: +1 800 IHS CARE (+1 800 447 2273)

Europe, Middle East, and Africa: +44 (0) 1344 328 300

Asia and the Pacific Rim: +604 291 3600

Disclaimer

The information contained in this report is confidential. Any unauthorized use, disclosure, reproduction, or dissemination, in full or in part, in any media or by any means, without the prior written permission of IHS Markit or any of its affiliates ("IHS Markit") is strictly prohibited. IHS Markit owns all IHS Markit logos and trade names contained in this report that are subject to license. Opinions, statements, estimates, and projections in this report (including other media) are solely those of the individual author(s) at the time of writing and do not necessarily reflect the opinions of IHS Markit. Neither IHS Markit nor the author(s) has any obligation to update this report in the event that any content, opinion, statement, estimate, or projection (collectively, "information") changes or subsequently becomes inaccurate. IHS Markit makes no warranty, expressed or implied, as to the accuracy, completeness, or timeliness of any information in this report, and shall not in any way be liable to any recipient for any inaccuracies or omissions. Without limiting the foregoing, IHS Markit shall have no liability whatsoever to any recipient, whether in contract, in tort (including negligence), under warranty, under statute or otherwise, in respect of any loss or damage suffered by any recipient as a result of or in connection with any information provided, or any course of action determined, by it or any third party, whether or not based on any information provided. The inclusion of a link to an external website by IHS Markit should not be understood to be an endorsement of that website or the site's owners (or their products/services). IHS Markit is not responsible for either the content or output of external websites. Copyright © 2020, IHS Markit®. All rights reserved and all intellectual property rights are retained by IHS Markit.

