

Table SINV-28

International patent families granted in chemical engineering, by region, country, or economy: 1998–2020

(Number)

Region, country, or economy	Economy by income status	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
World	na	7,637	8,496	7,073	7,245	7,665	8,146	8,640	8,091	8,767	9,310	9,433	9,719	10,755	12,565	15,036	15,147	15,950	18,480	20,282	21,055	21,616	21,991	26,042
North America	na	1,596	1,693	1,493	1,420	1,318	1,409	1,327	1,018	1,203	1,088	1,089	1,124	1,432	1,499	1,517	1,536	1,587	1,625	1,613	1,617	1,488	1,654	1,679
Canada	High	93	94	83	91	81	80	85	56	84	55	56	77	71	93	96	97	98	117	103	108	91	112	121
Mexico	Upper middle	0	2	1	2	5	1	2	1	1	1	1	2	3	3	2	3	4	7	16	15	21	26	5
United States	High	1,502	1,597	1,410	1,327	1,233	1,328	1,240	961	1,118	1,032	1,032	1,046	1,358	1,402	1,419	1,436	1,485	1,501	1,493	1,494	1,377	1,517	1,553
Central America and Caribbean	na	1	1	0	0	0	1	2	0	2	1	0	0	0	2	1	2	2	0	0	0	2	1	0
Puerto Rico	High	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
South America	na	9	15	17	17	13	18	22	17	15	9	19	28	37	42	34	55	46	51	38	56	73	60	92
Argentina	Upper middle	0	2	3	1	1	3	2	0	2	0	1	1	0	1	0	1	1	1	1	4	2	3	2
Brazil	Upper middle	4	7	9	10	8	13	18	10	9	7	11	23	34	39	28	45	36	43	33	44	66	55	84
Europe	na	2,984	2,807	2,486	2,419	2,654	2,818	3,076	2,461	2,364	2,380	2,562	2,540	2,377	2,443	2,584	2,542	2,567	2,759	2,617	2,975	2,947	2,805	2,555
EU-27 + UK ^a	na	1,901	1,920	1,686	1,623	1,775	1,733	1,871	1,540	1,504	1,440	1,411	1,355	1,418	1,554	1,596	1,644	1,620	1,675	1,802	1,872	1,835	1,930	1,775
United Kingdom	High	147	140	117	126	133	172	144	120	113	114	100	94	82	109	104	89	108	87	106	108	103	95	123
EU-27 ^b	na	1,754	1,780	1,569	1,497	1,642	1,561	1,727	1,420	1,391	1,327	1,311	1,261	1,336	1,445	1,492	1,556	1,512	1,588	1,695	1,765	1,733	1,835	1,651
Austria	High	35	49	33	35	44	42	38	41	37	28	41	32	41	46	36	38	45	52	46	46	44	44	39
Belgium	High	21	24	15	18	23	20	23	19	25	22	21	25	23	29	33	29	25	38	47	42	36	47	50
Denmark	High	17	26	22	21	12	18	22	18	14	18	23	24	25	25	26	23	31	27	26	31	36	34	42
Finland	High	51	43	46	49	53	54	45	36	43	30	40	39	36	37	37	43	44	62	58	49	53	51	43
France	High	290	280	293	287	294	274	284	201	268	277	213	204	223	270	298	261	270	294	277	256	243	351	321
Germany	High	780	732	614	683	806	759	713	663	704	621	605	569	577	580	612	664	661	679	752	663	657	697	622
Hungary	High	5	5	4	8	4	5	5	1	4	4	4	3	4	8	5	3	4	9	6	6	3	4	4
Ireland	High	11	4	5	2	5	9	4	3	3	4	4	6	8	5	5	10	4	8	8	5	7	9	3
Italy	High	139	200	206	110	115	104	233	111	27	23	32	35	57	97	71	49	36	30	48	246	234	152	98
Netherlands	High	124	104	90	73	87	74	102	75	67	67	70	84	95	93	90	106	96	85	90	107	93	92	81
Spain	High	51	60	53	46	36	52	64	75	62	60	57	58	66	80	71	86	88	70	67	66	56	49	39
Sweden	High	82	95	79	66	68	67	87	58	62	55	56	58	73	52	62	61	46	76	83	66	66	63	81
Other Europe	na	1,083	887	800	796	879	1,085	1,205	921	860	940	1,151	1,185	959	889	988	898	947	1,084	816	1,102	1,112	875	780
Other Europe-2020 ^b	na	1,230	1,027	916	922	1,012	1,257	1,349	1,041	973	1,053	1,251	1,279	1,041	998	1,092	987	1,056	1,171	922	1,210	1,214	969	903
Belarus	Upper middle	5	4	4	3	8	7	8	7	10	11	12	10	4	6	7	6	5	6	3	8	6	2	4
Moldova	Lower middle	6	4	2	5	7	5	15	11	6	7	14	24	14	7	5	5	7	9	7	5	6	1	2
Norway	High	25	20	22	25	27	30	21	24	21	20	16	20	32	30	27	16	32	21	24	20	25	25	20
Russia	Upper middle	930	754	684	670	713	842	767	739	709	709	926	951	719	663	796	692	725	879	622	943	929	718	657
Switzerland	High	79	74	63	56	57	70	54	42	60	60	54	58	74	68	53	65	79	68	71	57	64	79	79

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Ukraine	Lower middle	35	27	22	34	63	128	338	97	52	125	123	121	110	110	87	108	93	93	82	60	69	36	8
Asia	na	2,864	3,503	2,776	3,157	3,437	3,621	3,904	4,380	5,001	5,689	5,599	5,883	6,747	8,455	10,750	10,885	11,608	13,905	15,860	16,267	16,964	17,325	21,546
China	Upper middle	88	119	209	208	271	594	682	671	758	960	1,403	1,922	2,231	3,212	4,727	4,987	5,720	9,193	10,773	10,943	11,811	12,128	16,109
India	Lower middle	5	7	10	9	9	12	16	12	16	18	10	15	15	15	21	23	41	39	45	47	63	55	49
Japan	High	2,437	2,787	2,223	2,546	2,560	2,417	2,497	2,529	2,716	2,884	2,740	2,815	3,108	3,371	3,586	3,046	3,017	2,299	2,493	2,307	2,111	2,040	2,129
Malaysia	Upper middle	1	0	2	1	0	4	1	5	6	18	2	3	12	12	25	12	14	19	12	23	18	2	3
Singapore	High	5	2	5	6	6	3	5	5	3	3	5	3	3	9	8	8	6	9	18	16	16	13	16
South Korea	High	242	500	226	231	464	443	579	1,014	1,321	1,625	1,276	979	1,204	1,624	2,184	2,520	2,523	2,058	2,185	2,607	2,664	2,815	3,040
Taiwan	High	77	81	98	153	121	140	120	140	178	178	157	140	170	208	196	281	275	274	315	308	258	255	186
Middle East	na	18	27	24	25	26	22	17	19	17	19	18	19	29	20	39	37	47	57	59	67	70	77	83
Israel	High	16	25	15	14	16	18	9	12	9	11	10	11	17	12	17	16	19	25	22	21	22	24	22
Africa	na	40	48	42	40	33	35	38	41	26	27	45	41	34	21	29	19	20	9	15	12	10	8	11
South Africa	Upper middle	36	40	31	34	24	24	33	37	25	24	44	34	30	10	19	16	13	6	10	6	5	3	5
Australia and Oceania	na	95	117	120	135	177	221	242	133	122	88	94	80	95	80	76	66	69	69	70	58	59	59	74
Australia	High	88	107	117	129	171	214	233	121	112	77	85	70	82	67	64	52	55	51	53	50	50	52	69
New Zealand	High	7	10	3	6	6	7	9	12	11	11	10	10	12	13	12	15	14	19	17	9	8	7	6
Unclassified	na	31	284	116	32	6	1	12	21	17	9	7	3	4	4	6	4	4	4	9	4	3	3	3

na = not applicable, metric not calculated at this level.

EU = European Union; UK = United Kingdom.

^a The United Kingdom was a part of the EU for data purposes from 1973 to 2019.^b Beginning in 2020, the United Kingdom was no longer a member of the EU.**Note(s):**

International Patent Documentation (INPADOC) patent families across all patent offices covered in the Worldwide Patent Statistical Database (PATSTAT) are counted according to the year of the first granted patent in the patent family. Patent families are allocated according to patent inventorship information found on the priority patent of the INPADOC patent families. To account for missing ownership information in PATSTAT for some offices, a method designed by de Rassenfosse et al. (2013) is used to fill missing information on priority patents using information in successive filings within the families. Priority patents not indexed in PATSTAT are replaced by the next utility patent(s) in the families according to filing dates. Patent families are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named inventors. Patents are classified under the World Intellectual Property Organization (WIPO) classification of patents, which classifies International Patent Classification (IPC) codes under 35 technical fields. IPC reformed codes take into account changes that were made to the WIPO classification in 2006 under the eighth version of the classification and were used to prepare these data. China includes Hong Kong. Data were extracted in June 2021. Because of data coverage issues for some patent offices in PATSTAT, statistics for some countries may be underestimated partially for some years or across the whole trend. Countries with identified issues include India (missing data) and South Africa (no data for 2018). For Italy, because of data gaps regarding information on granted patents, patent applications are used instead, which slightly overestimates Italy's output and creates a small shift in year for which its output is accounted. As patent authorities become more involved with the European Patent Organisation, these gaps should disappear in the future, strengthening the robustness of statistics for these countries.

Source(s):

National Center for Science and Engineering Statistics; Science-Metrix; PATSTAT, accessed October 2021.