

Table SINV-14

International patent families granted in optics, 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	14,583	15,397	13,264	13,067	13,853	15,237	15,833	14,889	17,643	19,545	19,483	19,378	21,770	23,772	25,339	25,689	24,944	21,686	22,818	22,432	21,441	23,429	22,387
North America	na	2,344	2,301	2,195	2,333	2,372	2,783	2,706	2,102	2,190	1,991	1,876	1,737	1,969	1,696	1,688	1,707	1,868	1,865	1,874	1,789	1,628	1,928	1,902
Canada	High	93	79	78	77	91	128	112	95	89	86	107	105	111	103	106	105	128	107	116	116	85	106	98
Mexico	Upper middle	1	2	0	1	3	3	2	2	2	3	0	2	0	1	2	4	4	3	9	9	5	10	4
United States	High	2,250	2,220	2,117	2,255	2,278	2,652	2,592	2,006	2,099	1,902	1,768	1,630	1,858	1,592	1,580	1,598	1,736	1,755	1,749	1,665	1,539	1,812	1,800
Central America and Caribbean	na	1	1	0	0	0	0	0	1	0	0	1	0	0	0	0	1	0	1	0	0	1	0	0
Puerto Rico	High	1	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	1	1	3	2	4	2	3	0	3	2	1	5	1	1	3	6	3	5	8	9	15	16	14
Argentina	Upper middle	1	0	1	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	1	0
Brazil	Upper middle	1	1	2	2	3	1	3	0	3	2	1	4	1	1	3	5	3	3	6	7	15	15	14
Europe	na	1,389	1,237	1,178	1,171	1,261	1,584	1,620	1,363	1,431	1,315	1,385	1,296	1,284	1,223	1,316	1,361	1,340	1,410	1,392	1,647	1,569	1,648	1,412
EU-27 + UK ^a	na	1,112	1,073	1,011	995	1,081	1,361	1,337	1,137	1,199	1,091	1,127	1,004	1,046	1,008	1,116	1,130	1,118	1,130	1,167	1,373	1,307	1,358	1,189
United Kingdom	High	189	151	152	141	169	214	170	162	123	101	108	93	99	84	76	71	70	89	97	95	81	91	95
EU-27 ^b	na	922	921	859	854	912	1,147	1,167	975	1,076	990	1,019	911	947	923	1,040	1,060	1,047	1,040	1,070	1,278	1,225	1,267	1,094
Austria	High	10	11	24	16	12	18	16	15	22	20	17	14	26	19	25	14	21	24	21	28	33	22	23
Belgium	High	94	84	74	48	43	46	35	12	20	21	16	23	26	14	18	22	21	33	38	56	35	46	45
Denmark	High	4	4	5	7	4	16	12	8	5	11	9	13	7	7	4	9	11	11	11	12	8	6	10
Finland	High	8	6	11	7	6	12	15	20	16	13	18	16	28	15	14	7	14	19	19	24	25	34	42
France	High	210	203	135	155	181	276	227	162	204	166	218	171	181	204	202	201	185	191	225	214	239	253	173
Germany	High	365	357	360	408	460	531	557	541	549	475	454	390	436	412	460	495	511	521	516	594	548	568	514
Hungary	High	2	0	0	2	2	1	3	7	10	4	4	4	2	1	3	4	3	3	5	5	3	4	6
Ireland	High	2	1	0	0	3	5	4	3	6	3	1	3	3	6	3	5	5	3	3	5	5	7	6
Italy	High	98	117	118	75	57	61	118	54	32	21	23	32	21	29	35	24	13	23	19	99	89	76	51
Netherlands	High	56	47	37	45	72	83	96	71	138	174	184	150	135	134	175	183	146	100	114	127	135	156	129
Spain	High	17	19	7	18	14	14	10	20	15	20	23	25	26	29	27	32	31	25	22	27	28	23	17
Sweden	High	32	35	60	54	43	61	52	26	21	20	27	32	31	23	23	18	21	29	24	26	21	18	26
Other Europe	na	277	165	167	176	180	223	283	226	232	224	258	291	238	215	200	230	222	280	225	274	262	291	223
Other Europe-2020 ^b	na	467	316	319	317	349	437	452	388	354	325	366	385	337	300	276	301	292	369	322	369	343	382	318

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Belarus	Upper middle	14	2	1	1	3	3	6	7	7	8	8	16	13	9	6	4	4	7	5	7	3	4	2
Moldova	Lower middle	1	0	4	7	1	3	7	2	1	4	0	5	3	1	2	1	1	0	0	0	1	1	0
Norway	High	3	5	2	2	6	7	4	8	8	4	6	6	0	3	4	2	5	6	5	3	1	4	4
Russia	Upper middle	225	119	125	117	127	141	162	153	170	137	178	212	169	153	138	158	163	203	148	200	193	207	150
Switzerland	High	27	37	33	48	37	47	57	39	38	42	41	30	36	36	39	52	33	40	44	50	53	62	56
Ukraine	Lower middle	6	2	2	2	6	20	48	16	4	26	20	20	14	10	10	12	15	21	19	9	9	6	0
Asia	na	10,769	11,616	9,736	9,380	9,990	10,542	11,173	11,228	13,853	16,091	16,118	16,265	18,424	20,777	22,258	22,525	21,651	18,323	19,427	18,887	18,117	19,690	18,922
China	Upper middle	20	26	52	78	89	183	388	493	586	860	1,852	2,150	2,317	2,804	3,205	2,814	3,290	4,687	5,209	5,987	6,142	7,789	8,018
India	Lower middle	2	0	1	0	2	2	2	7	3	7	5	2	4	8	7	8	8	8	11	14	14	26	20
Japan	High	9,931	9,923	8,293	8,039	8,413	8,665	8,519	7,673	8,579	10,097	10,450	10,923	12,301	13,764	14,166	14,170	13,397	9,661	10,378	8,764	8,031	7,859	7,063
Malaysia	Upper middle	2	1	3	2	2	2	2	5	6	6	7	6	2	2	6	9	15	11	4	9	7	4	0
Singapore	High	4	5	6	11	9	16	19	23	16	12	16	12	13	9	13	8	12	21	15	16	15	19	21
South Korea	High	675	1,501	1,179	937	1,132	1,209	1,544	2,309	3,687	4,031	3,167	2,298	2,757	2,987	3,299	3,729	3,103	2,232	2,490	2,866	2,915	2,919	2,788
Taiwan	High	133	159	201	313	343	462	696	718	973	1,079	620	870	1,027	1,198	1,558	1,785	1,824	1,698	1,312	1,222	982	1,065	1,004
Middle East	na	25	21	22	40	32	55	48	27	39	30	33	37	49	37	48	42	54	59	69	66	83	121	106
Israel	High	24	21	20	37	29	53	48	26	36	29	32	36	46	35	43	41	49	54	62	59	77	112	97
Africa	na	7	2	2	5	7	5	5	5	3	6	8	2	2	2	3	4	4	2	3	2	3	2	2
South Africa	Upper middle	7	2	2	3	5	3	4	2	2	4	7	1	2	0	3	2	3	0	1	1	2	1	0
Australia and Oceania	na	40	59	77	127	179	261	271	148	123	93	58	37	39	27	22	31	23	22	25	32	24	24	28
Australia	High	37	58	76	124	175	256	268	146	122	90	56	33	36	25	19	24	21	18	21	28	21	21	24
New Zealand	High	3	1	1	3	3	5	3	2	1	3	2	4	3	2	3	6	2	4	4	4	3	2	4
Unclassified	na	8	158	51	9	8	5	8	14	1	17	3	0	2	11	0	14	0	0	19	0	1	0	0

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.

Science and Engineering Indicators