

Saving on Electricity and Water is Worthwhile

Especially Economical Household Appliances 2007/08

Consumer Information



Refrigerators and freezers, washing machines and dishwashers, as well as washer-dryers and driers, are purchases for many years of service. Along with good performance, above all they should be reliable and have a long life. Furthermore they

should be economical. Low power and water consumption leads to lower operating costs and less environmental loading

For many appliances, the operating costs over their lifetime are higher than the purchase price. Especially economic appliances thus save more on power and water costs over the years than the purchase price.

In Germany, in the fall of 2007 roughly 2,100 different refrigerators and freezers, 500 washing machines, 600 dishwashers, 190 driers, and 40 washer-driers are offered. Among these are some especially economic models many with moderate, and still a certain number with high power and water consumption.

The differences in consumption are often only in terms of "decimal places". However, one should not be deceived here:

For washing machines, 20 liters more water each use causes additional costs of 234 € over 15 years.

For refrigerators and freezers, 100 kWh more cause additional electricity costs of 225 € over 15 years, plus possible price increases. The most economical tabletop refrigerator with */*** compartment saves about 400 € over 15 years, compared with the model with the highest power consumption. A higher price of e.g. 200 € is therefore a very profitable investment.

This leaflet summarizes especially economical models of the common designs and size classes. It should serve as orientation for taking low power and water consumption into account. The information is based on market data from August 2007. Should you read this brochure at a much later time or not find the information you seek here, please look in the Internet under www.spargeraete.de. In this online database, you will find the entire up-to-date German offering known to the authors of this brochure.

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Energy Efficiency and the "EURO label"

Consumers require simple orientation in order to be able to compare the power and water consumption of household appliances without complicated calculations. For different designs, sizes and performance, this is often difficult. At first glance the Euro label, with its simple A - G classification for energy efficiency appears to be helpful. One would think that A units would be altogether efficient in their energy consumption and G units, on the other hand, grossly wasteful, with B units presumably well above the average. Unfortunately, this is very deceiving, since the A - G scale agreed on more than 12 years ago in connection with the energy consumption labeling ordinance is entirely obsolete for many designs. It is more often deceiving than showing the way to savings. The extended scale with A+ and A++ introduced at the beginning of 2004 is helpful only in connection with refrigerators and freezers. At washing machines is the in catalogues often shown A+ helpful too, also it does not exist officially by EU regulation.

The table shown here indicates how the currently available models of the most common designs are distributed over the energy efficiency classes A++ to G.

For refrigerators and freezers, the market of interest covers the range of units between A++ and A+. Models labeled A or B are mostly already second-class.

For washing machines is A+ a helpful information, nearly all models of dishwashers belong to class A. In the meantime there are five A and 47 B dryers along with 150 C- und one E units. For washer-driers, the market is largely divided into B and C units, with only three A models.

For freezers, washing machines and dishwashers, then, in terms of energy efficiency today it is no longer enough to look for the A label. Refrigerators should be at least A+, preferably A++.

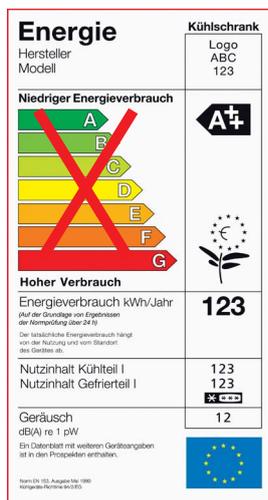
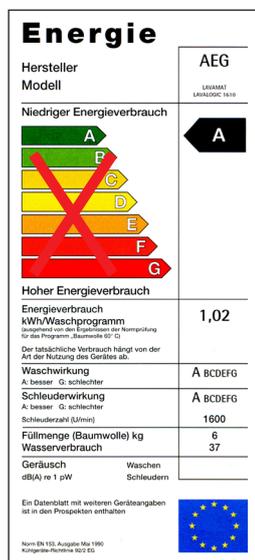
For washing machines and dishwashers, the A+ of the Euro label no longer helps at all. Here, the difficulty to recognize qualities of gentleness in washing, long service lives, noise level and later servicing are of primary importance. For washing machines, there are also A - G labels for washing effectiveness and spinning effectiveness at maximum speed. These data apply to the Cotton 60° washing program. How economically or cleanly a washing machine washes with other programs can not be recognized on the basis of this label. A criterion for how well the washing powder is rinsed away the end does not exist at all.

For driers, an A to G scale exists only for energy efficiency. This applies to the drying program "Cotton completely dry" and for laundry previously spin-dried at 800 rpm. Caution, however: The consumption data in kWh in the catalog apply, depending on the manufacturer, for laundry spin-dried at 800, 1000 or even 1400 rpm and can therefore often not be directly compared. Whoever spin-dries laundry at a higher speed achieves increasingly lower rates of consumption.

For dishwashers, there are A to G values for the energy efficiency and for the cleaning and drying effectiveness. Other than for washing machines, here the manufacturers themselves can define the appropriate dishwashing program, but must specify this.

			Energy efficiency class										
Refrigerators and freezers			Form/Size	Number	A++	A+	A	B	C	D	E	F	G
Refrigerators without star compartment			TG/TGU	68	6	18	38	6	--	--	--	--	--
Refrigerators without star compartment			SG -400 l	64	1	29	33	1	--	--	--	--	--
Refrigerators with (*/***)compartment			TG/TGU	53	7	18	28	--	--	--	--	--	--
Refrigerators with (*/***)compartment			SG -400 l	22	--	10	12	--	--	--	--	--	--
Refrigerators with (*/***)compartment			EG, 89 cm	85	3	35	41	6	--	--	--	--	--
Combined refrigerator-freezers			SG 200-400 l	442	24	160	254	4	--	--	--	--	--
Freezers			TG/TGU	53	2	16	32	3	--	--	--	--	--
Freezers			SG -400 l	206	33	79	90	4	--	--	--	--	--
Deep freeze units			200-400 l	85	30	36	4	13	--	--	2	--	--
Washing machines					A+	A	B	C	D	E	F	G	
Front loaders			4,5 kg	34	n.v.	--	32	1	1	--	--	--	--
Top loaders			4,5 kg	13	--	13	--	--	--	--	--	--	--
Front loaders			5,0 kg	147	--	25	120	2	--	--	--	--	--
Top loaders			5,0 kg	68	--	15	49	4	--	--	--	--	--
Front-/Toploaders XXL			5,5 - 7,0 kg	257	--	27	230	--	--	--	--	--	--
Drum wash-driers					A	B	C	D	E	F	G		
Front-/Toploaders			4,5 kg	3	n.v.	--	--	2	1	--	--	--	
Front-/Toploaders			5,0 kg	35	--	3	17	15	--	--	--	--	
Front-/Toploaders			6,0 kg	9	--	3	6	--	--	--	--	--	
Drum driers					A	B	C	D	E	F	G		
Exhaust air driers, gas-driven			5,0 kg	1	n.v.	1	--	--	--	--	--	--	
Exhaust air driers, electrical			4,5-7,0 kg	62	--	--	61	--	1	--	--	--	
Condensation driers with heat pump			6,0 kg	4	--	4	--	--	--	--	--	--	
Condensation driers, electrical			4,5-7,0 kg	136	--	47	89	--	--	--	--	--	
Dishwashers					A	B	C	D	E	F	G		
Front loaders 60 cm wide			12-15 Ged.	516	n.v.	506	4	6	--	--	--	--	
Front loaders 45 cm wide			8-10 Ged.	195	--	178	15	2	--	--	--	--	

TG=table unit, TGU=table unit, installable underneath, SG=standing unit, EG=built-in unit, sets=number of place settings
n.e.= not existing in this size. Source: NEI household appliance database, August 20, 2007



Especially Economical Refrigerators without Star Compartment

<u>Tabletop/under table</u>								Electricity costs in 15 years (€)
Manufacturer, model	Design	Total useful volume (liters)	Current consumption (kWh/yr)	Euro label (A..G)	Height (cm)	Width (cm)	Depth (cm)	
Especially economical:								
Liebherr KTP 1750 w/es	TG	156	84	A++	85,0	60,0	61,0	227,-
Miele K 2319 S	TGU ⁽¹⁾	150	84	A++	85,0	60,1	62,6	227,-
Bosch KTR 16P20	TG	152	85	A++	85,0	60,0	61,0	230,-
Siemens KT 16 RP 20	TGU ⁽¹⁾	152	85	A++	85,0	60,0	61,0	230,-
Quelle Priv. 155 KS A++ (148.912 / 231.111)	TGU ⁽¹⁾	152	86	A++	85,0	59,5	63,5	232,-
Relatively economical:								
Bosch KTR 16A21	TGU ⁽¹⁾	152	113	A+	85,0	60,0	61,0	305,-
Miele K 1120 S / K 1121 S	TGU	152	113	A+	85,0	60,0	61,2	305,-
Siemens KT 16RA21	TGU ⁽¹⁾	152	113	A+	85,0	60,0	61,0	305,-
Liebherr KTP 1810	TG	174	120	A+	85,0	60,0	62,8	324,-
Average consumption: (70 models)	---	---	140	--	---	---	---	379,-
High consumption:	---	138	232	B	---	---	---	626,-

<u>Standing units</u>								Electricity costs in 15 years (€)
Manufacturer, model	Design	Total useful volume (liters)	Current consumption (kWh/yr)	Euro label (A..G)	Height (cm)	Width (cm)	Depth (cm)	
Especially economical:								
Zanker ZKC 261	SG	243	92	A++	140,0	60,0	63,0	248,-
Relatively economical:								
Otto Hanseatic KS 354w (324.115)	SG	354	131	A+	185,0	60,0	60,0	354,-
Ariston MSA4 43	SG	351	139	A+	180,0	59,8	62,0	375,-
AEG Santo 72390 KA	SG	375	146	A+	180,0	60,0	64,5	394,-
Average consumption: (79 models)	---	---	160	--	---	---	---	433,-
High consumption:	---	307	263	?	---	---	---	710,-

(1) Tabletop unit, can be installed as under-table unit, 82 cm high after removing working

Climatic categories and location

A number of factors determine the power consumption of refrigerators and freezers: the technology, the thermal insulation of the housing, the efficiency of the cooling system, the ambient temperature at the given location, and the type of use. The cooler the location, the lower the power consumption. However, it is also necessary to pay attention to the climatic category of the unit. Units of climatic category SN (subnormal) are suited to use with temperatures from 16°C to 32°C, e.g. in normal kitchens. For warmer locations, the climatic categories ST (subtropical), suited for ambient temperatures from +18°C to +38°C, or T (tropical), suited for ambient temperatures from +18°C to +43°C, may be appropriate. At excessively cold ambient temperatures, the thermostat of the unit may not function correctly. At excessively high ambient temperatures, the power consumption increases drastically and it may not be possible to maintain the required inner temperature, or the unit may be overloaded. Locating the unit next to a stove, dishwasher, heating or under direct sunlight is therefore always unfavorable.

It is also important that sufficient air can reach the heat-exchanging surfaces of the unit, which are usually located on the rear of the unit, but occasionally also on the sides. This requires sufficiently large air openings, which must be kept open at all times.

The power consumption required for operation can be kept to a minimum by opening the door as infrequently as possible and not leaving open when not necessary, as well as placing food into the unit only after it has cooled off. In this way, less warm, moist air and water vapor enter the unit, reducing the frequency of defrosting.

Especially Economical Refrigerators without Star Compartment

<u>Built-in units</u>	Total Design	Current useful volume (liters)	consumption (kWh/yr)	Euro label (A..G)	Height (cm)	Width (cm)	Depth (cm)	Electricity costs in 15 years (€)
<u>Built-in under table units⁽¹⁾</u>								
Only moderately economical:⁽²⁾								
Quelle Priv. 60800 KSui (524.001)	UGE	140	135	A	82,0	60,0	55,0	365,-
Gorenje RIU 6134 W	UGE	143	139	A	82,0	60,0	55,0	375,-
Körting KRU 150	UGE	143	139	A	82,0	60,0	55,0	375,-
Juno JRP 40600	UGE	160	153	A	82,0	60,0	55,0	413,-
Quelle Priv. 50800 KSu (690.547)	UGE	160	153	A	82,0	60,0	56,0	413,-
Bosch KUR 16A40	UGE	177	157	A	82,0	60,0	57,0	424,-
Average consumption: (22 models)	---	---	158	--	---	---	---	428,-
High consumption:	---	146	208	B	---	---	---	562,-
<u>Built-in units, 89 cm high</u>								
Relatively economical:⁽³⁾								
AEG Santo K 88803-4 i / 98800-4 i	EG	155	117	A+	88,0	56,0	55,0	316,-
Juno JRG 90880	EG	155	117	A+	87,0	56,0	55,0	316,-
Quelle Privileg 70300 i (063.547)	EG	155	117	A+	88,0	56,0	55,0	316,-
Average consumption: (84 models)	---	---	140	--	---	---	---	378,-
High consumption::	---	147	208	B	---	---	---	562,-
<u>Built-in units, 103 cm high</u>								
Relatively economical:⁽³⁾								
Quelle Priv. 70400 KSi (393.390x)	EG	185	120	A+	103,0	56,0	55,0	324,-
Bauknecht KRI 1809/A	EG	181	122	A+	103,2	57,0	55,0	329,-
Bosch KFR / KIR 20A50	EG	184	126	A+	102,5	54,0	54,0	340,-
Küppersbusch IKE 209-6	EG	184	126	A+	102,5	54,0	54,0	340,-
Miele K 513 i-2	EG	184	126	A+	102,5	56,8	55,0	340,-
Neff KD 331 A / KE 334 A / KE 335 A	EG	184	126	A+	102,5	56,0	55,0	340,-
Siemens KF / KI 20RA50	EG	184	126	A+	102,0	56,0	56,0	340,-
Average consumption: (27 models)	---	---	142	--	---	---	---	382,-
High consumption:	---	181	212	B	---	---	---	572,-
<u>Built-in units, ab 124 cm high</u>								
Relatively economical:⁽³⁾								
AEG Santo 2300-7 /K 71203-4 i / 91200-4 E	EG	228	131	A+	122,5	56,0	55,0	354,-
Electrolux ERN 23500	EG	228	131	A+	121,8	54,0	54,9	354,-
Miele K 9412 i	EG	228	131	A+	122,5	56,0	55,0	354,-
Quelle Priv. 90555 KS i/d (372870 /829801)	EG	228	131	A+	122,5	56,0	55,0	354,-
Liebherr IKP 2850	EG	260	139	A+	141,3	57,0	55,0	374,-
Miele K 9552 iD	EG	260	139	A+	140,0	56,8	55,0	375,-
Quelle Priv. 70700 KSi (819.319)	EG	330	145	A+	178,0	56,0	55,0	392,-
AEG Santo K 91800-4 i	EG	330	145	A+	177,4	56,0	55,0	392,-
Average consumption: (66 models)	---	---	153	--	---	---	---	413,-
High consumption:	---	220	339	B	---	---	---	917,-

(1) Under-table unit with own base, furniture front must be provided.

(2) Only "Only moderately economical", since tabletop units of same size for under-table installation are considerably more economical.

(3) Only "Relatively economical", since larger models are relatively more economical. For new kitchens, larger recess height may be necessary.

(4) Only "Relatively economical" compared with free-standing units of the same size; see also "Standing units" on page 3.

Especially Economical Refrigerators with (*/***) Compartment (-18°C)

<u>Tabletop/under table units</u>										
Manufacturer, model	Total useful volume (liters)	Refrig. volume (+5°C) (liters)	Freezer volume (-18°C) (liters)	Power consume (kWh/year)	Euro label (A..G)	Height (cm)	Width (cm)	Depth (cm)	Electricity costs in 15 years (€)	
Especially economical:										
Miele K 2329 S	131	115	16	124	A++	85,0 ⁽¹⁾	60,1	62,6	335,-	
Bosch KTL 16P20 / 16V23	132	116	16	125	A++	85,0 ⁽¹⁾	60,0	61,0	338,-	
Siemens KT 16LP20	132	116	16	125	A++	85,0 ⁽¹⁾	60,0	61,0	338,-	
Liebherr KTP 1554 w/es	137	119	18	127	A++	85,0 ⁽¹⁾	60,0	61,0	343,-	
Quelle Priv. 144 KS(*/***) A++ (923.359 / 149.379)	137	119	18	134	A++	85,0 ⁽¹⁾	60,0	61,0	362,-	
Relatively economical:										
Miele K 1220 S / K 1221 S,	135	119	16	157	A+	85,0 ⁽¹⁾	60,0	61,2	424,-	
Bosch KTL 16A21 / ..A71	135	119	16	157	A+	85,0 ⁽¹⁾	60,0	61,2	424,-	
Siemens KT 16LA21	135	119	16	157	A+	85,0 ⁽¹⁾	60,0	61,2	424,-	
Quelle Priv. 146 KS(*/***) A+ (205.981 / 741.125)	140	122	18	183	A+	85,0 ⁽¹⁾	55,0	61,2	494,-	
Zanker ZKR 1516	140	122	18	183	A+	85,0 ⁽¹⁾	55,0	61,2	494,-	
Liebherr KTP 1714	151	133	18	188	A+	85,0	60,0	62,8	508,-	
Average consumption: (64 models):	---	---	---	203	--	---	---	---	547,-	
High consumption:	146	127	19	270	B	---	---	---	729,-	

<u>Standing units</u>										
Manufacturer, model	Total useful volume (liters)	Refrig. volume (+5°C) (liters)	Freezer volume (-18°C) (liters)	Power consume (kWh/year)	Euro label (A..G)	Height (cm)	Width (cm)	Depth (cm)	Electricity costs in 15 years (€)	
Especially economical:										
Quelle Privileg 260 KS (*/***) (684.297)	255	237	18	208	A+	140,0	60,0	63,0	562,-	
Relatively economical:										
Quelle Privileg 271 KS (*/***) (142.521 / 619.717)	268	247	21	226	A+	147,0	60,0	64,0	610,-	
Gorenje RB 6288 / 6298	268	247	21	226	A+	147,0	60,0	64,0	610,-	
Liebherr K 2954	273	242	31	245	A+	144,7	60,0	63,2	660,-	
Average consumption: (31 models):	---	---	---	249	--	---	---	---	673,-	
High consumption:	196	180	16	292	B	---	---	---	788,-	

(1) Tabletop unit, can be installed as under-table unit, 82 cm high after removing working

How many stars for what?

Refrigerators and freezers have seven different temperature zones, suited to the storage or freezing of different foodstuffs. The classic freezer compartment has +5°C inner temperature and can keep milk products, cold cuts and cheese fresh over a few days' time. The somewhat warmer main storage compartment has a temperature of +8°C to +14°C and is suited to the storage of fruits and vegetables, as well as keeping drinks cooled. Colder is the "cold storage compartment" or "fresh compartment" at about 0°C, intended for the temporary storage of meat, cold cuts, mushrooms and wild fruit. Multi-zone units therefore usually consume more power than pure refrigerators, refrigerators with a (*/***) compartment or refrigerator-freezer combinations. Whether these have advantages in the household depends on the possibilities for storage, as well as on shopping and cooking habits.

In addition to freezer and special compartments, there are also ice compartments and star compartments with from one to four stars. "Ice" compartments are often not exactly defined. If these have no (*) designation, one should assume that they are in the temperature region of 0°C, that is not suited to either the storage or the freezing of foodstuffs intended for deep freezing. (*) compartments with -6°C inner temperature and (**) compartments with -12°C inner temperature are suited only to the short-term storage of already frozen deep freeze goods before using within a time of one to a few days. One can not freeze fresh foods in this compartment. Whoever wishes to store frozen goods longer requires at least a (***) compartment with -18°C or preferably a (*/***) compartment with -18°C. The difference between (***) and (*/***) compartments has to do with their freezing behavior. Only (*/***) compartments can coll fresh goods fast enough so that other already frozen goods in storage do not thaw in the meantime and spoil. Whoever wishes to freeze fresh foodstuffs therefore requires a (*/***) compartment.

Especially Economical Refrigerators with (*/***) Compartment (-18°C)

<u>Built-in units</u>	Total useful volume (liters)	Refrig. volume (+5°C) (liters)	Freezer volume (-18°C) (liters)	Power consume (kWh/year)	Euro label (A..G)	Height (cm)	Width (cm)	Depth (cm)	Electricity costs in 15 years (€)
<u>Built-in under table units⁽¹⁾</u>									
Relatively economical: ⁽²⁾									
Zanker ZKK 8401	140	123	17	172	A	87,3	54,5	55,0	463,-
Average consumption: (24 models):	---	---	---	223	--	---	---	---	601,-
High consumption:	129	111	18	314	B	---	---	---	848,-
<u>Built-in units, 89 cm high</u>									
Especially economical:									
Liebherr IKP 1554	134	118	16	135	A++	87,4	57,0	55,0	365,-
Miele K 9254 iF	134	118	16	135	A++	88,0	56,0	55,0	365,-
AEG Öko-Santo K 98843-4 i	151	134	17	138	A++	88,0	56,0	55,0	373,-
Average consumption: (87 models):	---	---	---	207	--	---	---	---	558,-
High consumption:	130	112	18	310	B	---	---	---	837,-
<u>Built-in units, 103 cm high</u>									
Especially economical:									
Liebherr IKP 1854	166	150	16	146	A++	102,4	57,0	55,0	394,-
Miele K 9354 iF	166	150	16	146	A++	102,5	56,8	55,0	394,-
Relatively economical:									
Quelle Privileg 74400 KSi (265.291)	165	148	17	186	A	103,0	56,0	55,0	502,-
Average consumption: (23 models):	---	---	---	213	--	---	---	---	574,-
High consumption:	161	143	18	264	B	---	---	---	713,-
<u>Built-in units, 124 cm high</u>									
Especially economical:									
Liebherr IKP 2254	207	191	16	157	A++	122,0	57,0	55,0	424,-
Miele K 9454 iF	207	191	16	157	A++	122,5	56,0	55,0	424,-
AEG Öko-Santo K 91243-4 i	206	189	17	160	A++	122,5	56,0	55,0	432,-
Relatively economical: ⁽²⁾									
AEG Santo 2200-7 m	227	210	17	219	A+	122,5	56,0	55,0	591,-
Average consumption: (67 models):	---	---	---	237	--	---	---	---	640,-
High consumption:	202	184	18	354	B	---	---	---	956,-
<u>Built-in units, 140-180 cm high</u>									
Especially economical:									
Liebherr IKP 2654	243	223	20	172	A++	139,7	57,0	55,0	463,-
Miele K 9554 iDF	243	223	20	172	A++	140,0	56,8	55,0	464,-
Relatively economical: ⁽²⁾									
Smeg FL 281 A	262	214	48	229	A	157,5	54,0	54,0	618,-
Miele K 9754 iDF	309	282	27	270	A+	178,5	56,8	55,0	729,-
Average consumption: (15 models):	---	---	---	273	--	---	---	---	736,-
High consumption:	230	184	46	376	B	---	---	---	1015,-

(1) Under-table unit with own base, furniture front must be provided.

(2) Only "Relatively economical" compared with free-standing combination refrigerator-freezers of the same size.

Especially Economical Combination Refrigerator-Freezers⁽¹⁾

<u>Standing units</u>	Total useful volume (liters)	Refrig. volume (+5°C) (liters)	Freezer volume (-18°C) (liters)	Power consume (kWh/year)	Euro label (A..G)	Height (cm)	Width (cm)	Depth (cm)	Electricity costs in 15 years (€)
200-400 liters:									
Especially economical:⁽²⁾									
Quelle Priv. 264 KGK A++ (267.687 / 394.354 / 690.337...)	258	176	82	181	A++	166,0	60,0	63,0	489,-
Candy CFC 320 AA	258	197	61	190	A++	185,0	60,0	60,0	512,-
Blomberg DSM 1630	281	215	66	190	A++	162,5	60,0	60,0	513,-
Quelle Priv. 296 KGK A++ (405.782 / 213.797)	291	221	70	194	A++	160,0	60,0	65,0	502,-
Zanker ZKD 295 / 2955 es	291	221	70	194	A++	160,0	60,0	65,0	524,-
Haier HRF-370 AAA SS	285	202	83	197	A++	184,0	60,0	61,0	532,-
AEG Santo 80312 KG2	299	218	81	200	A++	185,0	60,0	62,5	540,-
Quelle Priv. 308 KGK A++ (051.117 / 685.945 / 967.813...)	303	221	82	202	A++	185,0	60,0	63,0	545,-
Zanker ZKK 3175 /S es	303	221	82	202	A++	185,0	60,0	63,0	545,-
Haier HRF-470 AAA SS	325	240	85	208	A++	200,0	60,0	61,0	562,-
AEG Santo 80362 KG2	338	256	82	211	A++	200,0	60,0	62,5	570,-
Quelle Priv. 334 KGK A++ (952.046 / 238.092)	318	221	97	211	A++	200,0	60,0	63,0	570,-
Liebherr CP 4056	354	265	89	215	A++	198,2	60,0	63,2	582,-
Relatively economical:⁽³⁾									
Bosch KGN 36A60	284	221	63	227	A+	185,0	60,0	65,0	613,-
Otto Hanseatic KGK 298 (487.352)	298	239	59	241	A+	170,0	60,0	60,0	651,-
Bosch KDV 33X41	303	235	68	248	A+	170,0	60,0	65,0	670,-
Siemens KD 33X41	303	235	68	248	A+	170,0	60,0	64,0	670,-
Haier HFR-369 AA	289	199	90	252	A+	187,2	60,0	66,0	680,-
Bomann KG 311	292	205	87	254	A+	186,5	59,5	60,0	686,-
Quelle Priv. 308 KGK A+ (104.185)	303	221	82	255	A+	175,0	60,0	63,0	689,-
Zanker ZKK 3171 /Ses	303	221	82	255	A+	185,0	60,0	63,0	689,-
Forn COO 2210 SHC / SHS	301	218	83	256	A+	185,0	59,5	60,0	691,-
EBD KG 3260	301	218	83	256	A+	185,0	59,5	60,0	691,-
Ariston MBAA 3811	306	213	93	263	A+	181,0	60,0	60,0	710,-
AEG Santo 80408 KGR2 / KGL2	338	256	82	266	A+	200,0	60,0	62,5	718,-
Quelle Priv. 334 KGK A+ (146.275 / 216.764)	318	221	97	267	A+	200,0	60,0	63,0	721,-
Average consumption: (448 models)	---	---	---	312	---	---	---	---	843,-
High consumption:	280	193	87	577	B	---	---	---	1.581,-

(1) Combination refrigerator-freezers are units with two outer doors, for the refrigerator and the (*/*/*) part. See KS(*/*/*/*), pages 5 and 6.

(2) "Extremely economical" = A++ and less than 0.160 kWh per 100 liter equivalent useful volume

(3) "Especially economical" = A++ or A+ and 151-180 kWh per 100 liter equivalent useful volume

Defrosting, No-frost or Low-frost

Ice forms in refrigerators and freezers when humid air flows in on opening the door or when foodstuffs are stored. A small amount of ice is not a problem, but a large amount of ice increases power consumption when it covers the surface of the inner heat exchanger or hinders closing the door. Defrosting is then necessary.

No-frost units have a small blower for the permanent circulation of an air current to prevent the formation of ice within the unit. This may be convenient, however the fan requires 10 to 30 percent more power. On the other hand, no power is consumed for cooling down the unit again, as is otherwise required following manual defrosting.

Low-frost units or stop-frost units reduce the intake of air from the outside and the expulsion of air from within during the temperature change, without additional power consumption. The frequency of defrosting can be reduced by loading and unloading as quickly as possible, preferably once over a longer time than opening the door several times in rapid succession. Especially with freezers, one should ensure that no ice forms on the door seals. If these do not seal correctly due to the presence of ice, ice then forms faster in the rest of the unit.

Especially Economical Combination Refrigerator-Freezers⁽¹⁾

<u>Built-in units</u>	Total useful volume (liters)	Refrig. volume (+5°C) (liters)	Freezer volume (-18°C) (liters)	Power consume (kWh/year)	Euro label (A..G)	Height (cm)	Width (cm)	Depth (cm)	Electricity costs in 15 years (€)
<u>123 cm high:</u>									
Relatively economical: ⁽²⁾									
Bosch KIF 24A50	174	160 ⁽³⁾	16	228	A+	122,0	54,0	53,0	616,-
AEG Santo D 91240-4 i	195	151	44	230	A+	122,5	56,0	55,0	621,-
Bosch KID 24A20	194	152	42	231	A+	122,0	54,0	54,0	624,-
Neff KT 434A	194	152	42	232	A+	122,5	56,0	55,0	626,-
Siemens KI 24 DA20	194	152	42	232	A+	122,0	56,0	55,0	626,-
Average consumption: (32 models):	---	---	---	254	A	---	---	---	687,-
High consumption:	176	134	42	358	B	---	---	---	967,-
<u>145 cm high:</u>									
Relatively economical: ⁽²⁾									
Candy CDPA 240 A+	218	179	36	208	A+	142,0	54,0	55,0	562,-
AEG Santo D 91440-4 i	224	184	40	243	A+	144,8	56,0	55,0	656,-
Bosch KID 26A20	230	188	42	246	A+	144,5	54,0	54,0	664,-
Siemens KI 26DA20	231	188	43	247	A+	145,0	56,0	55,0	667,-
Neff KT 534 A / K 1674X6	231	188	43	247	A+	145,0	56,0	55,0	667,-
Average consumption: (43 models):	---	---	---	289	A	---	---	---	779,-
High consumption:	266	214	52	384	B	---	---	---	1.037,-
<u>160 cm high:</u>									
Relatively economical: ⁽²⁾									
Liebherr IC 2956 / ICUS 2913	247	190	57	259	A+	159,0	57,0	55,0	700,-
Bosch KID 28A20	258	216	42	259	A+	158,0	54,0	54,0	700,-
Neff KT 634 A	258	216	42	260	A+	158,0	56,0	55,0	702,-
Siemens KI 28DA20	258	216	42	260	A+	157,8	56,0	55,0	702,-
Average consumption: (26 models):	---	---	---	286	--	---	---	---	773,-
High consumption:	254	159	65	398	B	---	---	---	1.074,-
<u>180-200 cm high:⁽⁴⁾</u>									
Especially economical:									
Küppersbusch IKE 309-5-2T	280	210	70	208	A++	177,2	54,0	54,7	562,-
Quelle Priv. 77700 KGi (789.948)	280	210	70	208	A++	178,0	56,0	55,0	562,-
AEG Santo C 91841-4 i	275	205	70	208	A++	178,0	56,0	55,0	562,-
Relatively economical: ⁽²⁾									
Liebherr ICU 3252	289	219	70	284	A+	177,8	57,0	56,0	767,-
Average consumption: (92 models):	---	---	---	319	--	---	---	---	860,-
High consumption:	390	294	96	548	B	---	---	---	1.480,-

(1) Refrigerator-freezer combinations have two outer doors, for the refrigerator and the (*/**) part. See KS(*/*/*), pages 5 and 6.

(2) Only "Relatively economical" compared with free-standing units of the same size.

(3) Refrigeration zone contains ,99 l cooling zone (5°C) and 61 Liter cold storage compartment (0°C)

CFCs und FCs

The cooling circuits and insulating materials of older refrigerators and freezers usually contain fluorinated-chlorinated carbohydrates (CFCs) or fluorinated carbohydrates (FCs), which are very damaging to the environment. In order to prevent the release of these substances to the atmosphere, old units may not be disposed of as bulky refuse or placed at the edge of the curb, but must be correctly disposed of. This entails the removal by suction of the harmful substances, eliminating potential environmental damage. Your town or city administration and your disposal company can tell you who is able to properly dispose of old units. In new units CFCs is forbidden, and FCs are fortunately only rarely used. If you want to contribute to environmental protection, look for the property "CFC and FC - free" at the time of purchase.

Especially Economical Upright Freezers

<u>Tabletop/under table</u>								Electricity costs in 15 years (€)
Manufacturer, model	Design	Total useful volume (liters)	Current consumption (kWh/yr)	Euro label (A..G)	Height (cm)	Width (cm)	Depth (cm)	
Especially economical:								
Liebherr GP 1466	TG	104	135	A++	85,0	60,0	61,0	365,-
Miele F 1365 S	TG	101	135	A++	85,0	60,0	62,5	365,-
Relatively economical:								
Quelle Priv. 100 GS A+ (547.604)	TG	85	168	A+	85,0	56,0	60,0	454,-
Bomann GS 109	TG	85	172	A+	84,5	54,5	57,0	464,-
Bosch GSD 11V20	TGU	80	175	A+	85,0	55,0	61,0	473,-
Siemens GS 11DV20	TGU	80	175	A+	85,0	55,0	61,0	473,-
Bosch GSD 12A20	TGU	91	176	A+	85,0	60,0	61,2	475,-
Siemens GS 12DA20	TGU	91	176	A+	85,0	60,0	61,2	475,-
Bauknecht GKA 175 Optima	TG	104	179	A+	85,0	60,0	60,0	483,-
Average consumption: (61 models)	---	---	206	--	---	---	---	556,-
High consumption:	---	89	328	C	---	---	---	886,-

<u>Standing units</u>								Electricity costs in 15 years (€)
Manufacturer, model	Design	Total useful volume (liters)	Current consumption (kWh/yr)	Euro label (A..G)	Height (cm)	Width (cm)	Depth (cm)	
Especially economical:								
Quelle Priv. 185 GS A++ (046.917 / 896.349)	SG	164	162	A++	140,0	60,0	63,0	437,-
AEG Öko-Arctis 80220 GS	SG	188	172	A++	160,0	60,0	62,5	464,-
Quelle Priv. 220 GS A++ (062.098 / 798.178)	SG	195	175	A++	160,0	60,0	63,0	473,-
Liebherr GNP 2076 (NoFrost)	SG	172	179	A++	125,0	66,0	68,3	483,-
Quelle Priv. 245 GS A++ (420.593)	SG	210	180	A++	145,0	66,0	68,0	486,-
AEG Arctis 70290 GS1	SG	252	198	A++	165,0	66,0	68,0	535,-
Quelle 290 GS A++ (081.731)	SG	252	198	A++	165,0	66,0	68,0	535,-
Liebherr GNP 2476 (NoFrost)	SG	216	201	A++	144,7	66,0	68,3	542,-
Miele FN 4493 S (NoFrost)	SG	217	201	A++	144,7	60,0	63,2	543,-
Bosch GSP 32A31	SG	262	203	A++	155,0	70,0	75,0	548,-
AEG Arctis 70340 GS1	SG	300	217	A++	185,0	66,0	68,0	586,-
Bosch GSP 36A31 / Siemens GS 36PA31	SG	296	217	A++	170,0	70,0	75,0	586,-
Quelle 335 GS A++ (037.495)	SG	300	218	A++	185,0	66,0	68,0	589,-
Liebherr GNP 2976 (NoFrost)	SG	261	223	A++	164,4	66,0	68,3	601,-
Bosch GSP 40A31 / Siemens GS 40PA31	SG	330	232	A++	185,0	70,0	75,0	626,-
Average consumption: (225 models)	---	---	266	--	---	---	---	718,-
High consumption:	---	311	449	B	---	---	---	1.212,-

<u>Built-in units</u>								Electricity costs in 15 years (€)
Manufacturer, model	Design	Total useful volume (liters)	Current consumption (kWh/yr)	Euro label (A..G)	Height (cm)	Width (cm)	Depth (cm)	
Built-in under-table units⁽¹⁾								
Only moderately economical:⁽²⁾								
Gorenje FIU 6104 W	UGE	86	204	A	82,0	60,0	55,0	551,-
Körting KFU 100	UGE	86	204	A	82,0	60,0	55,0	551,-
Bosch GUD 15A40	UGE	93	208	A	82,0	60,0	55,0	562,-
Gaggenau RF 200	UGE	107	212	A	82,0	60,0	55,0	572,-
Average consumption: (11 models)	---	---	239	---	---	---	---	646,-
High consumption:	---	98	292	B	---	---	---	788,-

(1) Under-table unit with own base, furniture front must be provided.

(2) Only "Relatively economical" compared with under-table units of the same size. See page 9, above.

Especially Economical Upright Freezers (continued)

<u>Built-in units</u> (continued)	Design	Total useful volume (liters)	Current consumption (kWh/yr)	Euro label (A..G)	Height (cm)	Width (cm)	Depth (cm)	Electricity costs in 15 years (€)	
Built-in units 72 cm high									
Relatively economical:									
Juno JUG 94720		EG	70	175	A+	72,5	56,0	55,0	473,-
Average consumption: (11 models)		---	---	181	--	---	---	---	488,-
High consumption:		---	67	193	B	---	---	---	521,-
Built-in units 89 cm high									
Relatively economical:									
Blomberg FTE 1530 i		EG	85	181	A+	87,4	54,0	54,8	488,-
Gorenje FI 4112 W		EG	86	186	A+	87,5	57,0	55,0	502,-
AEG Arctis 1100-7m / Arctis G 98850-5 E		EG	94	190	A+	88,0	56,0	55,0	513,-
Bosch GID 18A20 / GID 18A50 / GFD 18A50		EG	98	194	A+	87,0	54,0	54,0	524,-
Neff GD 241 A / GE 244 / GE 245		EG	98	194	A+	88,0	56,0	55,0	524,-
Siemens GF 18DA50 / GI 18DA20 / GI 18DA50		EG	98	194	A+	88,0	56,0	55,0	524,-
Liebherr EG 1113 / IG 1156 / IGS 1113		EG	104	204	A+	87,4	57,0	55,0	552,-
Average consumption: (48 models)		EG	---	217	--	---	---	---	586,-
High consumption:		EG	109	296	B	---	---	---	799,-

Especially Economical Chest Freezers

<u>Standing units 100-400 liters</u>	Total useful volume (liters)	Current consumption (kWh/yr)	Euro Label (A..G)	Height (cm)	Width (cm)	Depth (cm)	Electricity costs in 15 years (€)
Especially economical:							
Vestfrost FZ 107 C	107	117	A++	86,0	72,0	65,0	316,-
Quelle Privileg 163 GT A++ (701.795)	159	134	A++	88,0	94,0	67,0	362,-
Zanker ZKC 160A	159	134	A++	87,6	93,5	66,5	362,-
Frigor TLM 210	186	142	A++	89,5	98,0	64,5	384,-
Quelle Privileg 229 GT A++ (925.126)	223	143	A++	88,0	149,0	67,0	386,-
Skandiluxe SE 260	239	153	A+	85,0	126,0	65,0	413,-
Frigor TLM 310	266	164	A++	89,5	128,0	64,5	443,-
Liebherr GTP 2626	245	172	A++	91,7	113,2	70,9	463,-
Miele GT 266 ES	245	172	A++	91,7	113,2	76,6	464,-
Otto / Baur Hanseatic HA 260++ (498.001)	245	172	A++	91,5	113,5	76,0	463,-
Quelle Privileg 264 GT A++ (701.966)	257	173	A++	88,0	133,0	67,0	467,-
AEG Arctis 80270 GT	257	177	A++	87,6	132,5	66,5	478,-
Liebherr GTP 3126	291	183	A++	91,7	128,8	70,9	493,-
Baur / Otto Hanseatic HA 310++ (498.080)	291	183	A++	91,5	129,0	76,0	493,-
Miele GT 316 ES	291	183	A++	91,7	128,8	76,6	494,-
Frigor TLM 410	325	183	A++	89,5	150,0	64,5	493,-
Quelle Privileg 335 GT A++ (703.251)	327	200	A++	88,0	160,0	67,0	540,-
Zanker ZKC 330 A	327	200	A++	87,6	160,0	66,5	540,-
AEG Arctis 80340 GT	327	202	A++	88,0	160,0	66,5	545,-
Miele GT 376 ES	352	204	A++	91,7	137,2	76,6	551,-
Liebherr GTP 3726	352	204	A++	91,7	137,2	75,8	552,-
Average consumption: (156 models)		---	243	---	---	---	655,-
High consumption:		377	584	E	---	---	1,577,-

Especially Economical Washing Machines

with hot water connection

Front loaders 6	Laundry Volume (kg)	Spin drier speed (rpm)	Eurolabel			Power cons. (kWh)	Gas ⁽¹⁾ cons. (kWh)	Water cons. (liters)	Consumpt. costs in 15 years (€)
			E Energy	W Washing	S Spin-Drying				
Manufacturer, model									
Only model:									
Miele W 3841 WPS Allwater <u>with</u> hot water usage	6,0	1600	A	A	A	0,55	0,50	47	944,-
Miele W 3841 WPS Allwater <u>without</u> hot water usage	6,0	1600	A	A	A	1,02	----	47	1060,-

(1) Data for hot water usage from wall-mounted compact gas heating appliance with assumed 94% availability. For the shared use of solar heating hot water, the costs are still less, e.g. with 50% solar heating coverage 903 € in 15 years. See page 12.

Especially Economical Washing Machines

without hot water connection

For these units, we no longer publish a list showing the individual washing machines with the lowest power and water consumption, as in previous years. The reason is that models with extremely low water consumption in some cases show unsatisfactory rinsing properties. The following tables therefore show only the bandwidth for the consumption levels of the currently available models.

In past years, considerable water savings were achieved without disadvantages to the washing quality, above all with more favorable washing vat forms using the "showering instead of bathing" technique and spin drying between rinsing cycles. However, the currently available models using the least amount of water also "save" partly by eliminating one rinsing cycle or reduced amounts of water. Instead, there is an "Extra rinsing" or "Allergy" button, which initiates an additional rinsing cycle using additional water. Unfortunately, no mention is made of the effect on rinsing quality. If one does not know whether a model with low water consumption meets the rinsing requirements, other

qualities should be given a higher priority. Differentiated quality criteria for environmentally sustainable washing machines have recently been formulated in a study of the Ecological Institute or EcoTopTen. The list of criteria and the research report can be found under the address www.ecotopten.de, under Downloads. Also worth reading are the Stiftung Warentest (in the September edition) and Öko-Test (consumer advice magazines) test reports about washing machines. For the future, for all washing machines it would be desirable to declare the rinsing effectiveness and the consumption values for the most frequently used 30°C and 40°C washing programs.

The tables differentiate between 4.5 kg, 5 kg and XXL units with 5.5 kg or 6 kg loads. The 4.5 kg units often have a higher consumption level than the 5 kg models and are therefore not recommended. Whether large 5.5 kg or 6 kg XXL units are meaningful must be carefully considered, since these are often more economical only when fully loaded.

<u>5 kg front loaders</u>				<u>5 kg top loaders</u>			
Manufacturer, model	Power cons. (kWh)	Water cons. (liters)	Power and water costs in 15 years (€)	Manufacturer, model	Power cons. (kWh)	Water cons. (liters)	Power and water costs in 15 years (€)
Lowest consumption:	0,85	35,0	808,-	Lowest consumption:	0,75	38,0	817,-
Average consumption (164 mod.):	0,91	45,0	962,-	Average consumption (69 mod.):	0,91	45,1	963,-
High consumption:	1,15	59,0	1244,-	High consumption:	1,15	59,0	1243,-

<u>XXL-units⁽¹⁾</u>				<u>4,5 kg-units</u>			
Manufacturer, model	Power cons. (kWh)	Water cons. (liters)	Power and water costs in 15 years (€)	Manufacturer, model	Power cons. (kWh)	Water cons. (liters)	Power and water costs in 15 years (€)
Lowest consumption:	0,90	37,0	881,-	Lowest consumption:	0,75	37,0	824,-
Average consumption (258 mod.):	1,06	48,3	1068,-	Average consumption (47 mod.):	0,85	46,4	957,-
High consumption:	1,33	64,0	1384,-	High consumption:	1,20	59,0	1264,-

(1) XXL = front and top loaders with 5.5 or 6.0 kg

Especially Economical Washer-Dryers

without hot water connection 4,5 - 6,0 kg

Manufacturer, model	Design	Laundry vol. (kg)	Drier vol. (kg)	Spin-drier speed (rpm)	Eurolabel		Power cons. washing (kWh)	water cons. wash. (liters)	Power cons. drying (kWh)	Water cons. drying (Liter)	Height (cm)	Width (cm)	Depth (cm)	Power- and water-costs in 15 years (€)
					Energy	Washing								
Especially economical:														
Miele WT 2670 / 2679 ⁽³⁾	TGU	5,0	2,5	1600	A	A	0,85	42	2,55	23	85,0	59,5	58,0	2269,-
Miele WT 2679i ⁽²⁾	UGE	5,0	2,5	1600	A	A	0,85	42	2,55	23	82,0	59,5	58,0	2269,-
Relatively economical:														
Ariston AMD 149	TG	5,0	2,5	1400	B	A	0,95	39	2,85	36	85,0	59,5	53,5	2566,-
Indesit WIDE 126 / 146	TG	5,0	2,5	1400	B	A	0,95	39	2,85	36	85,0	59,5	53,5	2566,-
Foron WT 1269 A	TG	5,0	2,5	1200	B	A	1,10	51	2,70	41	85,0	59,5	58,5	2785,-
AEG Lavamat Turbo 16820 ⁽³⁾	TGU	6,0	3,0	1600	B	A	1,10	45	3,60	36	82,0	60,0	60,0	2996,-
Average consumption (46 mod.)	---	---	---	---	---	---	0,96	46	3,30	46	---	---	---	3111,-
High consumption:	UGE	6,0	4,0	1300	C	A	1,14	54	4,36	91	---	---	---	4183,-

(1) Washer-driers are washing machines combined with a drier. The models named here can e.g. wash 5 kg laundry and dry 2.5 kg laundry per drying cycle. Following washing, one must therefore remove half of the laundry and dry the remaining laundry. When this is dry, the other half of the laundry is dried. For the washer-driers named here, drying takes place by the water condensation technique. The heated dry air is thus led past a water-cooled surface onto which the water vapor condenses and flows off as water. For drying, these units therefore also require (cooling) water. Washer-driers are intended for small households, in which a separate drier can not be installed and in which there is no possibility to hang laundry onto a clothes line.

(2) For integration as an under-table unit, furniture front must be provided.

(3) Tabletop unit, can be installed as under-table unit, 82 cm high after removing working plate.

Note on calculating operating costs

All volume data, dimensions and consumption data are provided by the respective manufacturer. The cost data are based on the assumptions of 18 Euro-cents/kWh for the cost of electricity, 5.5 Euro-cents/m³ for the cost of water, and 7 Euro-cents/kWh for the cost of gas. The costs of electricity and, where relevant, water are extrapolated over a period of 15 years, without taking possible price increases or interest payments into account. It is assumed that refrigerators and freezers are in continuous use, washing machines, washer-driers or driers are used three times per week with the washing program "Cotton 60°C" and "Cotton - cabinet-dry", respectively, and dishwashers are used five times per week in the program respectively declared in the Euro label.

In the tables, the absolutely most economical model is usually given first. Models with higher consumption levels are then listed successively, according to greater or only slight differences. Possible additional criteria are given in the footnotes. Inclusion in the lists and the order of naming does not represent another quality evaluation. Further information about economical household appliances can be found on the Internet pages of the respective manufacturers listed in the addresses on page 16. Further information is also available from dealers, consumer advice services, public energy consulting services, communities, and energy providers, as well as in the publications of Stiftung Warentest and Öko-Test.

A vastly more comprehensive overview of available refrigerators and freezers, washing machines, washer-driers, driers, and dishwashers is given in the NEI Internet database. There, it is possible to search free of charge for units having a specific design, style, size, performance, efficiency or from a specific manufacturer. The selection is automatically sorted according to economy of operation.

Especially Economical Driers

Drum driers 4,0 - 6,0 kg

<u>All designs</u>		Drier volume (kg)	Euro-label (A...G)	Power cons. (1000 rpm) (kWh)	Gas(2) cons. (kWh)	Height (cm)	Width (cm)	Depth (cm)	Energy-costs in 15 years (€)
Manufacturer, model	Design								
Exhausting driers									
Especially economical: (gas-fired)									
Crosslee White Knight BG DE 437	TG	5,0	A	0,35 ⁽²⁾	2,50	85,0	59,6	57,0	535,-
Relatively economical: (pure electrical)									
17 5-kg-models from 5 manufacturers (Electrolux, Miele, Neckermann, Quelle, Siemens)	TG/TGU ⁽¹⁾	5,0	B/C	2,85 ⁽²⁾		---	---	---	1285,-
8 6-kg-models v. Miele T 288, 7634, 8302, 8303, 8322, 8323, 8523, 9146	TG/TGU ⁽¹⁾	6,0	C	3,20 ⁽²⁾		85,0	59,5	58,0	1348,-
Average consumption: (56 models)	---	---	C	3,05 ⁽²⁾		---	---	---	1292,-
High consumption:	---	6,0	D	3,74 ⁽²⁾		---	---	---	1575,-
Air condensation driers									
Especially economical: (with heat-pump)									
Blomberg TKF 1350	TGU ⁽¹⁾	6,0	A	2,00 ⁽²⁾		85,0	60,0	59,5	842,-
AEG Lavatherm 59800	TG	6,0	A	2,10 ⁽²⁾		85,0	60,0	60,0	885,-
Quelle Priv. 9750 WP (057.834)	TG	6,0	A	2,10 ⁽²⁾		85,0	60,0	60,0	885,-
Zanker WPKX 9000 (Neckermann 887.072)	TG	6,0	A	2,10 ⁽²⁾		85,0	60,0	60,0	885,-
Relatively economical: (without heat-pump)									
Quelle Priv. CD 60, 110, 130, 610, 615, 10510/.20, 22535	TG	5,0	C	3,10 ⁽²⁾		85,0	59 ⁽⁶⁾	58 ⁽⁶⁾	1306,-
Zanker EK 6000 / EK 7000	TG	5,0	C	3,10 ⁽²⁾		85,0	60,0	61 ⁽⁶⁾	1306,-
Miele T 298, 7644, 7744, 840... 842..., 8685, 9246, 9446 C	TG	6,0	C	3,30 ⁽²⁾		85,0	59,5	58 ⁽⁶⁾	1390,-
Average consumption (104 models)	---	---	C	3,38 ⁽²⁾		---	---	---	1424,-
High consumption:	---	6,0	D	3,92 ⁽²⁾		---	---	---	1651,-

(1) Tabletop unit, can be installed as under-table unit, 82 cm high after removing working plate.

(2) Consumption data since 2007 ,for pre-spin drying of laundry at 1000 rpm. In former years 800 rpm.

(3) 1 cm³ gas assumed to be 9.35 kWh. This value can vary slightly from one gas supply region to another.

(4) For integration as an under-table unit, furniture front must be provided.

(5) Some of the data from www.ecotopten.de.

(6) Sizes can differ little at some units.

Gas driers, Heat pump driers and Drier cabinets

The energy consumption for drying depends on the efficiency of water removal by spin drying, the drying technique, the unit size, and the efficiency of the respective drier. While in earlier times nearly all consumption data applies to pre-spin drying of

laundry at 800 rpm, in 2007 data are mostly published basing on 1000 rpm as a result of new regulations for measurements. Often parallel consumption values for pre-spin drying of laundry at 800 rpm, 1000 rpm and 1400 rpm are published. This can cause confusion. Here shown data are basing on 1000 rpm. Since the differences in consumption are very different according to the speed of the spin-dry process, households with large amounts of colored and high-temperature laundry should use washing machines with at least 1200 rpm, preferably 1400 rpm.

From the technical standpoint, gas-driven and heat pump driers consume the least primary energy and have the lowest operating costs. At the same time, the purchase prices for these units are higher. Among conventional driers, air-vented driers are more economical than air condensation driers. For operation in a heated apartment, however, it is necessary to consider that air-vented driers blow warm air out of the room in winter requesting additional heating.

Still more economical than all drum driers are drier cabinets with a built-in fan that blows only cold air around the laundry hanging in it for 12-20 hours. Such units are available from NIMO and TPS (see page 16 for addresses). Using these however with hot air, with heating, results in considerably greater consumption of power than with comparable drum driers. Remember that the least amount of electricity is consumed by a wash line.

Especially Economical Dishwashers

12-14 place settings, 60 cm wide

Manufacturer, model	Volume (place- Design settings)	Eurolabel ⁽¹⁾			Power cons. (kWh)	Water cons. (liters)	Hot water connect		Width (cm)	Depth (cm)	Power + water costs in 15 years (€)
		Energy	Cleaning	Drying			max. (°C)	Height (cm)			
Tabletop/under-table units											
Especially economical and A/A/A:											
Blomberg GSN 1581 (TGU) / GIN 1580 (UG)	TGU 12	A	A	A	1,05	9	60	85,0 ⁽²⁾	60,0	57,0	930,-
Miele G 1552 SC	TGU 12	A	A	A	1,05	10	60	85,0 ⁽²⁾	59,8	60,0	952,-
Relatively economical:											
Bosch SGD 55.. 58.. 69.. / SGU 58..	UG 12	A	A	A	1,05	12	60	81,0	59,8	57,0	995,-
Bosch SGS 09.. 55.. 58.. 69..	TGU 12	A	A	A	1,05	12	60	85,0 ⁽²⁾	60,0	60,0	995,-
Gaggenau DI 290-130 / 291-130	UG 12	A	A	A	1,05	12	60	81,0 ⁽⁴⁾	60,0	58,0	995,-
LG LD-2150 LH	TG 12	A	A	A	1,05	12	0	85,0	60,0	60,0	995,-
Neff SD 55 N1 / SD 759 V / SD 85 N	UG 12	A	A	A	1,05	12	60	81,0 ⁽⁴⁾	59,5	57,0	995,-
Otto Hanseatic GS /d Prem. (433.042 / 759.679)	TGU 12	A	A	A	1,05	12	0	85,0 ⁽²⁾	60,0	57,0	995,-
Siemens SE 20T.. 24M.. 25M.. 25T.. 26T..	TGU 12	A	A	A	1,05	12	60	85,0 ⁽²⁾	60,0	60,0	995,-
Average consumption: (192 models)	---	---	---	---	1,07	14,5	---	---	---	---	1060,-
High consumption:	---	12	C	B	C	1,45	22,0	---	---	---	1476,-

Manufacturer, model	Volume (place- Design settings)	Eurolabel ⁽¹⁾			Power cons. (kWh)	Water cons. (liters)	Hot water connect		Width (cm)	Depth (cm)	Power + water costs in 15 years (€)
		Energy	Cleaning	Drying			max. (°C)	Height (cm)			
Built-in units⁽³⁾											
Especially economical and A/A/A:											
Miele G 1552 / 1582 / 1832 / 1872 SCi / SCVi	UGE 12	A	A	A	1,05	10	60	81,0	60,0	57,0	952,-
Miele G 2552 / 2582 / 2832 / 2872 SCi / SCVi	UGE 14	A	A	A	1,08	10	60	85,0	59,8	60,0	973,-
Relatively economical:											
65 Modelle (Bosch, Gaggenau, Neff, Otto, Siemens)	UGE 12	A	A	A	1,05	12	0	81,0 ⁽⁴⁾	60,0	57,0	995,-
Miele G 1242, 2142 /72 /82, 2222 /42 /92, 2442	UGE 14	A	A	A	1,08	13	60	81,0 ⁽⁴⁾	60,0	60,0	1037,-
Average consumption: (340 models)	---	---	---	---	1,06	14,1	---	---	---	---	1044,-
High consumption:	---	12	C	A	A	1,30	18,0	---	---	---	1299,-

(1) Some models have little different sizes.

(2) Tabletop unit, can be installed as under-table unit, 4-5 cm lower after removing working plate.

(3) UG = Under-table units without working plate, with own front. UGE = UG for installation with furniture door.

(4) Some models 81 cm, other 86 cm high with little different width and depth.

Hot water connection for washing machines and dishwashers

Washing machines and dishwashers require the greatest part of the power consumed for heating the water. For washing machines, part of this can be saved by using units having an additional hot water connection in addition to the cold water connection (see page 11, above) or retrofitting with a hot water mixing unit (see page 15, below). Most dishwashers can be directly connected to hot water (see data in the column "Hot water connection"). Not recommended for hot water connections are dishwashers with internal heat recovery, e.g. many 45 cm models of Siemens-Bosch. since this technology is designed for use with a cold water connection only. The use of hot water is recommended when this is taken from solar systems, district heating, modern central heating, or suitable gas flow heaters. The feeder lines should be short and well insulated, and the hot water kept at a temperature not above 60°C. For washing machines, not more than two liters, and for dishwashers not more than one liter, cold water should flow from the faucet before hot water begins flowing. Whether a model is technically designed for a hot water connection should be clarified or read from the user manual. Older models may have supply hoses, water valves and automatic controls that are not suitable for connection to hot water.

Especially Economical Dishwashers

8-9 place settings, 45 cm wide, A/A/A to A/A/B

Manufacturer, model	Volume (place- Design settings)	Eurolabel ⁽¹⁾			Power cons. (kWh)	Water cons. (liters)	Hot water connect		Width (cm)	Depth (cm)	Power + water costs in 15 years (€)
		Energy	Cleaning	Drying			max. (°C)	Height (cm)			
Especially economical and A/A/A:											
Bosch SRS 45T72 / 45T92	TGU 9	A	A	A	0,80	11	0	85,0 ⁽²⁾	45,0	60,0	798,-
Bosch SRS 55M32 / 55M62	TGU 9	A	A	A	0,80	11	60	85,0 ⁽²⁾	45,0	60,0	798,-
Bosch SRU 45T34 / 45T35	UG 9	A	A	A	0,80	11	60	81,0 ⁽³⁾	45,0	57,0	798,-
Miele G 1102 SC / 1202 SC	TGU 9	A	A	A	0,80	11	60	85,0 ⁽²⁾	44,8	60,0	798,-
Miele G 1102 SCU / 1202 SCU	UG 9	A	A	A	0,80	11	60	82,0 ⁽³⁾	44,8	60,0	798,-
Siemens SF 24E232 / 24T257/..8 / 25M254	TGU 9	A	A	A/B	0,80	11	60	85,0 ⁽²⁾	45,0	60,0	798,-
Relatively economical and A/A/A: ⁽²⁾											
AEG Favorit 44460 / 44760 / 44860	TGU 9	A	A	B/A	0,80	13	60	85,0 ⁽²⁾	45,0	63,0	840,-
Electrolux ESF 45010	TG 9	A	A	A	0,80	13	0	85,0 ⁽²⁾	45,0	63,0	840,-
Quelle Priv. 630 / 635 / 640 / 650	TGU 9	A	A	A	0,80	13	60	85,0 ⁽²⁾	45,0	60,0	840,-
Quelle Priv. 44450 / 54550 / 64550 / 84650	TGU 9	A	A	A	0,80	13	60	85,0 ⁽²⁾	45,0	60,0	840,-
Average consumption: (63 models)	---	---	---	---	0,82	13,7	---	---	---	---	867,-
High consumption:	---	9	C	B	1,10	16,0	---	---	---	---	1115,-

Manufacturer, model	Volume (place- Design settings)	Eurolabel ⁽¹⁾			Power cons. (kWh)	Water cons. (liters)	Hot water connect		Width (cm)	Depth (cm)	Power + water costs in 15 years (€)
		Energy	Cleaning	Drying			max. (°C)	Height (cm)			
Built-in units⁽⁴⁾											
Especially economical and A/A/A:											
Miele G 1562 SCVi	UGE 9	A	A	A	0,80	9	60	81,0	44,8	60,0	755,-
Relatively economical and A/A/A:											
Bosch SRI 45T32 ..34 ..35	UGE 9	A	A	A	0,80	11	0	81,0 ⁽⁴⁾	45,0	57,0	798,-
Bosch SRV 45T33	UGE 9	A	A	A	0,80	11	60	81,0 ⁽⁴⁾	45,0	55,0	798,-
Miele G 1102 / 1202 / 1502 SCi	UGE 9	A	A	A	0,80	11	60	81,0 ⁽⁴⁾	44,8	60,0	798,-
Miele G 1162 / 1262 SCVi	UGE 9	A	A	A	0,80	11	60	81,0 ⁽⁴⁾	44,8	60,0	798,-
Neff SK 45 / SK 54 / SKV 54	UGE 9	A	A	A	0,80	11	60	81,0 ⁽⁴⁾	44,8	55-57	798,-
Siemens SF 44T.. / 54T.. ..253 / ..453 / ..553	UGE 9	A	A	A	0,80	11	60	81,0 ⁽⁴⁾	44,8	55,0	798,-
Siemens SF 55M251 ..451 ..551 / SF64T354	UGE 9	A	A	A	0,80	11	60	81,0 ⁽⁴⁾	44,8	55-57	798,-
Average consumption: (114 models)	---	---	---	---	0,81	13,4	---	---	---	---	854,-
High consumption:	---	9	C	B	1,10	16,0	---	---	---	---	1115,-

(1) Some models have little different sizes.

(2) Tabletop unit, can be installed as under-table unit, 4-5 cm lower after removing working plate.

(3) UG = Under-table units without working plate, with own front.

(4) UGE = UG for installation with furniture door; height can be 81 or 86 cm

Cut-in units for hot water usage with washing machines

Many washing machines having only a cold water connection can be supplied with hot water by installing a cut-in unit before the feeder hose for mixing hot and cold water to give the required temperature. This saves on electricity and reduces environmental loading. It must be clarified in advance

whether the feeder hose, solenoid valve, switching program and possibly other components of the washing machine are compatible with this. Manufacturers of such cut-in units are:

- Martin Elektrotechnik GmbH, Buchwaldstr. 53, 97769 Bad Brückenau (www.ms1002.de)
- OLFS & Ringen, Richtweg, 27412 Kirchtimke (www.olfs-ringen.de)
- Schwab & Wilms Energie-Beratungs-Service, 60596 Frankfurt, Tiroler Str. 61
- Stemberg Solar- und Gebäudetechnik, 32791 Lage, Im Seelenkamp 7 (www.Stemberg-Solar.de)

Manufacturers' addresses

AEG	Nuremberg, www.aeg-hausgeraete.de	Juno	Nuremberg, www.juno.de
Ariston	Frankfurt/M., www.indesitcompany.com	Körting (Gorenje)	Munich, www.koerting-einbaugeraete.de
Bauknecht	Stuttgart, www.bauknecht.de	Küppersbusch	Gelsenkirchen, www.kueppersbusch.de
Baur-Versand	Burgkundstadt, www.baur.de	Liebherr	Ochsenhausen, www.liebherr.com
Blomberg	Ahlen/Westf., www.blomberg.de	LG Electronics	Willich, www.lge.de
Bomann	Kempen, www.bomann.de	Miele	Gütersloh, www.miele.de
Bosch	Munich, www.bosch-hausgeraete.de	Neff	Munich, www.neff.de
Candy	Ratingen, www.candy.de	Nimo	Selm, www.raum-und-luft.de
Crosslee	Selm, www.raum-und-luft.de	Otto / Baur	Hamburg, www.otto.de
EBD (EFS)	Duisburg, www.ebd.de	Quelle	Fürth, www.quelle.de
Electrolux	Nuremberg, www.electrolux.de	Siemens	Munich, www.siemens-hausgeraete.de
Foron (EFS)	Duisburg, www.foron.de	Skandiluxe	Nottuln, www.skandiluxe.de
Frigor	Viborg (DK) www.frigor.dk	Smeg	Ismaning, www.smeg.de
Gaggenau	Munich, www.gaggenau.com	TPS (Kleinmann)	Grünberg, www.kleinmann.de
Gorenje	Munich, www.gorenje.de	Vestfrost	Nottuln, www.vestfrost.com
Haier	Wettenberg, www.haiereurope.com	Zanker	Nuremberg, www.zanker.de
Indesit	Frankfurt/M., www.indesitcompany.com		

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Federal Organization of Consumers, Berlin, www.vzbv.de

City of Frankfurt on Main, Office of Energy Matters, www.frankfurt.de

Working Group for Economical and Environmentally Friendly Energy Consumption (ASUE), Essen, www.asue.de

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