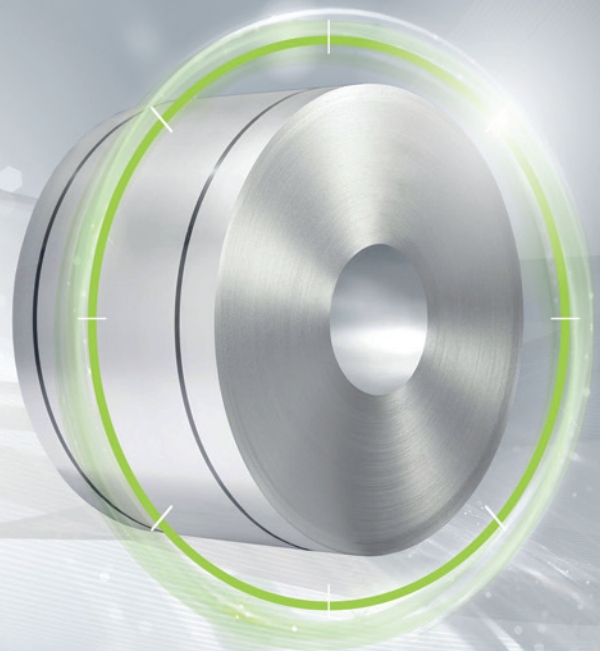


FULLY
PROCESSED

isovac 600-50 A HC

The specialist with high thermal conductivity

Manufactured in the most modern production lines, this fully processed isovac® grade exhibits highly homogeneous properties across the width and length of the entire strip. The result is excellent and consistent processability in the manufacture of highly efficient electrical components.

The high thermal conductivity of isovac 600-50 A HC (high conductivity) ensures rapid heat dissipation in combination with higher polarization while maintaining low specific total losses. This makes innovative design strategies possible for electrical machinery.

Upon request, isovac 600-50 A HC can be supplied with an electrical steel insulation system and can be used directly in as-delivered condition.

Convincing advantages:

- » Potential cost savings in electric machinery based on lower component sizes and thus lower material usage based on higher polarization than that in standard isovac® grades
- » Lower cooling power necessary through higher thermal conductivity than that of standard isovac® grades (conductivity increased by up to 20%)
- » Best processability through consistent mechanical properties and homogeneous, clean surfaces
- » Excellent stackability resulting from high dimensional accuracy in rolling direction and perpendicular to rolling direction (thickness tolerance)
- » Innovative electrical steel insulation systems upon request

voestalpine supplies isovac 600-50 A HC, an electrical steel of the highest quality. We offer you a customer-focused over-all package of products, service and logistics in addition to all the advantages of our integrated metallurgical facility and Steel Service Centers.

Grade named according to conventional international standards:

Grade named according to isovac®	DIN EN 10106		IEC 60404-8-4	JIS C2552	GOST 21427.2	ASTM A677	AISI	IS648	GB/T2521.1
	Material No.	Abbreviation							
isovac 600-50 A HC	1.0814	M600-50A	M600-50A 5	50A600	2112	-	-	50C600	50W600

Mechanical properties:

Tensile test according to DIN EN ISO 6892-1 and hardness according to DIN EN ISO 6507-1 (Typical values);
Test direction: Transverse

Grade named according to isovac®	Yield strength R _{eH} [MPa]	0.2 %-Yield strength R _{p0.2} [MPa]	Tensile strength R _m [MPa]	Elongation A ₈₀ [%]	Hardness HV5 [-]
isovac 600-50 A HC	325	280	400	37	115

Magnetic properties:

in as-delivered condition (Typical values)

Test direction: Mean value from longitudinal and transverse measurements at 50 Hz (60 Hz), single-sheet test

Grade named according to isovac®	Specific total loss				Magnetic polarization			Relative permeability
	1.0 T P10		1.5 T P15		2500 A/m J25	5000 A/m J50	10000 A/m J100	1.5 T μ _r
	50 Hz [W/kg]	60 Hz [W/lb]	50 Hz [W/kg]	60 Hz [W/lb]	[T]	[T]	[T]	[-]
isovac 600-50 A HC	2.45	1.40	5.30	3.02	1.64	1.72	1.83	2100

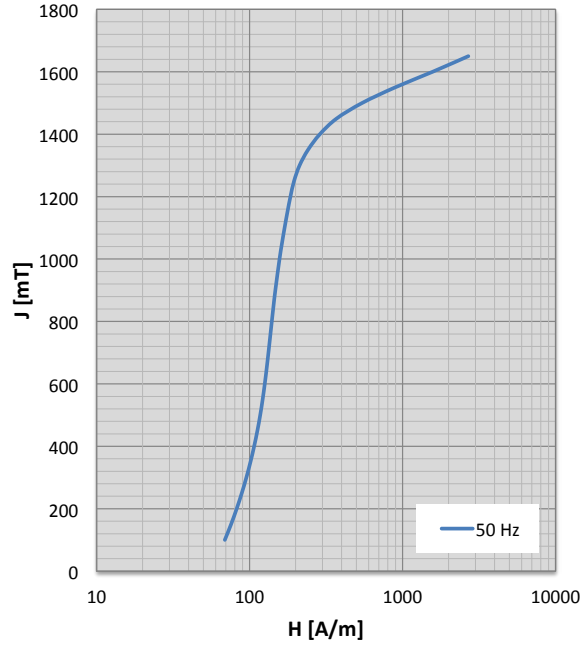
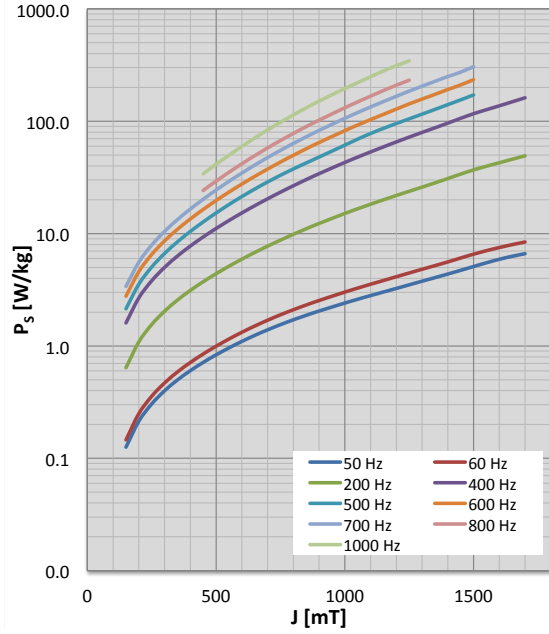
Physical properties:

Typical values

Grade named according to isovac®	Density ρ [g/cm³]	Specific electrical resistance ρ _s [μΩcm]	Thermal conductivity λ [W/mK]
isovac 600-50 A HC	7.80	28.2	42

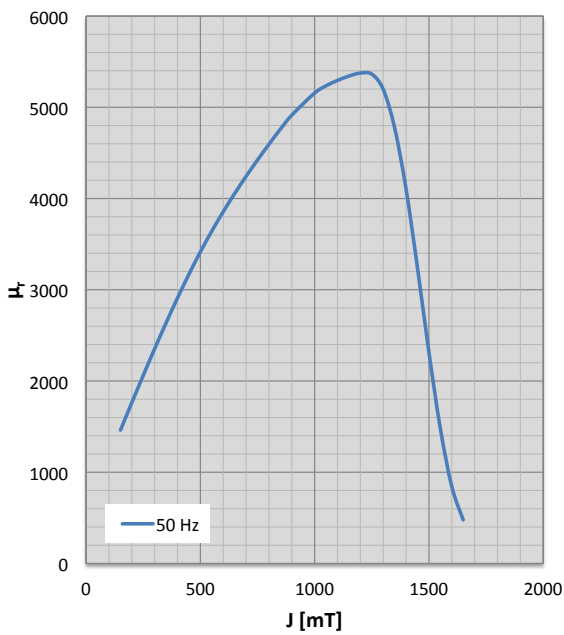
Characteristics P_s/J loss curve and characteristics J/H magnetization curve

Test direction: Mean value from longitudinal and transverse measurements at indicated frequencies, single-sheet test



Characteristics μ_r/J permeability curve

Test direction: Mean value from longitudinal and transverse measurements at 50 Hz, single-sheet test



Frequency dependence of magnetic properties

Test direction: Mean value longitudinal and transverse at indicated frequencies and polarizations, single-sheet test

50 Hz				60 Hz				200 Hz			
J [mT]	H [A/m]	P _s [W/kg]	μ _r [-]	J [mT]	H [A/m]	P _s [W/kg]	μ _r [-]	J [mT]	H [A/m]	P _s [W/kg]	μ _r [-]
100	69	0.04	1155	100	67	0.04	1193	100	69	0.20	1163
150	76	0.13	1460	150	75	0.15	1480	150	78	0.64	1408
200	82	0.21	1763	200	82	0.25	1766	200	87	1.09	1651
250	89	0.31	2062	250	89	0.36	2049	250	96	1.55	1889
300	95	0.40	2355	300	96	0.47	2329	300	105	2.04	2121
350	101	0.50	2638	350	103	0.59	2603	350	114	2.56	2345
400	107	0.60	2911	400	109	0.71	2872	400	122	3.12	2557
450	113	0.71	3171	450	114	0.85	3132	450	129	3.73	2757
500	117	0.83	3415	500	119	0.99	3384	500	137	4.39	2942
550	122	0.96	3643	550	123	1.15	3625	550	143	5.12	3110
600	126	1.10	3856	600	127	1.32	3856	600	149	5.92	3259
650	129	1.24	4055	650	130	1.50	4074	650	156	6.79	3389
700	133	1.39	4244	700	133	1.69	4280	700	162	7.73	3499
750	136	1.55	4423	750	136	1.89	4472	750	169	8.75	3588
800	140	1.71	4595	800	140	2.10	4650	800	176	9.85	3654
850	143	1.87	4761	850	144	2.31	4811	850	185	11.04	3698
900	147	2.04	4914	900	148	2.54	4955	900	194	12.31	3723
1000	157	2.41	5157	1000	158	3.01	5180	1000	215	15.10	3732
1050	163	2.60	5236	1050	164	3.27	5257	1050	226	16.62	3724
1100	169	2.81	5295	1100	171	3.54	5310	1100	237	18.25	3708
1150	177	3.02	5343	1150	179	3.82	5340	1150	250	19.98	3684
1200	185	3.25	5375	1200	188	4.13	5342	1200	262	21.83	3658
1250	195	3.50	5364	1250	198	4.46	5293	1250	274	23.79	3632
1300	212	3.77	5197	1300	216	4.81	5098	1300	289	25.91	3590
1350	241	4.05	4775	1350	247	5.18	4667	1350	310	28.26	3501
1400	288	4.37	4104	1400	294	5.60	4010	1400	341	30.90	3292
1450	370	4.71	3239	1450	372	6.06	3175	1450	396	33.85	2893
1500	544	5.09	2316	1500	552	6.56	2280	1500	551	36.88	2287
1550	895	5.50	1479	1550	927	7.04	1453	1550	905	39.76	1518
1600	1574	5.91	844	1600	1637	7.51	817	1600	1606	42.68	826
1650	2692	6.28	478	1650	2782	7.97	454	1650	2762	45.85	430
1700	4137	6.62	312	1700	4249	8.42	296	1700	4254	49.23	274

Frequency dependence of magnetic properties

Test direction: Mean value longitudinal and transverse at indicated frequencies and polarizations, single-sheet test

400 Hz				500 Hz				600 Hz			
J [mT]	H [A/m]	P _s [W/kg]	μ _r [-]	J [mT]	H [A/m]	P _s [W/kg]	μ _r [-]	J [mT]	H [A/m]	P _s [W/kg]	μ _r [-]
100	73	0.55	1095					100	81	1.01	980
150	84	1.60	1307	150	89	2.14	1222	150	92	2.77	1187
200	95	2.68	1515	200	99	3.55	1437	200	103	4.59	1388
250	106	3.81	1718	250	110	5.04	1643	250	114	6.52	1581
300	116	5.01	1910	300	120	6.66	1836	300	125	8.61	1760
350	127	6.32	2090	350	131	8.45	2012	350	137	10.92	1921
400	138	7.75	2253	400	143	10.45	2165	400	150	13.50	2059
450	149	9.34	2397	450	155	12.70	2291	450	163	16.40	2170
500	159	11.10	2518	500	168	15.25	2387	500	178	19.69	2250
550	170	13.07	2613	550	181	18.13	2449	550	193	23.40	2295
600	180	15.26	2684	600	196	21.35	2481	600	210	27.59	2309
650	192	17.70	2732	650	211	24.90	2489	650	228	32.28	2300
700	204	20.39	2758	700	228	28.80	2478	700	248	37.51	2272
750	218	23.37	2763	750	245	33.03	2455	750	269	43.33	2232
800	233	26.64	2750	800	263	37.60	2424	800	292	49.76	2185
850	250	30.22	2719	850	283	42.54	2390	850	317	56.84	2136
900	269	34.13	2676	900	304	48.00	2352	900	343	64.61	2087
1000	309	42.98	2577	1000	354	61.25	2248	1000	401	82.41	1988
1050	331	47.94	2529	1050	384	69.27	2180	1050	431	92.51	1938
1100	353	53.30	2480	1100	413	77.73	2118	1100	464	103.40	1889
1150	377	59.11	2429	1150	442	86.38	2069	1150	497	115.16	1841
1200	402	65.40	2377	1200	471	95.38	2027	1200	533	128.16	1792
1250	426	72.20	2327	1250	502	105.04	1983	1250	572	142.60	1741
1300	456	79.50	2271	1300	534	115.61	1937	1300	611	157.39	1694
1350	492	87.34	2206	1350	571	127.35	1884	1350	652	173.36	1649
1400	516	96.16	2159	1400	609	140.44	1830	1400	697	191.46	1599
1450	530	106.19	2120	1450	647	154.92	1782	1450	744	210.40	1550
1500	629	116.59	1907	1500	699	171.37	1708	1500	802	234.39	1488
1550	939	126.63	1393								
1600	1616	137.09	824								
1650	2763	148.86	470								
1700	4261	161.68	307								

Frequency dependence of magnetic properties

Test direction: Mean value longitudinal and transverse at indicated frequencies and polarizations, single-sheet test

700 Hz				800 Hz				1000 Hz			
J [mT]	H [A/m]	P _s [W/kg]	μ _r [-]	J [mT]	H [A/m]	P _s [W/kg]	μ _r [-]	J [mT]	H [A/m]	P _s [W/kg]	μ _r [-]
100	83	1.27	957								
150	94	3.39	1150								
200	106	5.57	1339								
250	118	7.91	1519								
300	130	10.47	1685								
350	143	13.32	1832								
400	157	16.54	1957	400	164	19.51	1949	400	180	27.26	1773
450	172	20.21	2054	450	179	24.20	2001	450	200	33.99	1796
500	189	24.40	2120	500	196	29.29	2037	500	221	41.35	1807
550	206	29.17	2151	550	215	35.12	2048	550	245	49.83	1797
600	226	34.58	2151	600	237	41.78	2034	600	272	59.63	1768
650	247	40.66	2128	650	261	49.34	2001	650	302	70.84	1725
700	270	47.47	2089	700	287	57.84	1955	700	335	83.54	1673
750	295	55.04	2039	750	315	67.33	1902	750	370	97.82	1616
800	321	63.41	1985	800	345	77.85	1846	800	409	113.78	1558
850	350	72.64	1933	850	377	89.47	1792	850	449	131.49	1505
900	380	82.79	1883	900	411	102.25	1740	900	492	150.98	1455
1000	446	106.13	1785	1000	485	131.71	1640	1000	583	195.35	1365
1050	482	119.46	1736	1050	525	148.59	1591	1050	631	220.48	1324
1100	519	133.90	1687	1100	567	167.16	1543	1100	683	248.62	1282
1150	558	149.52	1641	1150	612	187.53	1496	1150	740	280.15	1238
1200	599	166.60	1594	1200	658	209.12	1452	1200	793	312.43	1205
1250	643	185.29	1549	1250	704	231.96	1412	1250	838	344.96	1184
1300	687	204.92	1506	1300	758	258.96	1365	1300	918	388.90	1128
1350	734	226.49	1464								
1400	784	249.82	1421								
1450	834	273.40	1382								
1500	904	306.28	1321								

Available Dimensions

Grade named according to isovac®	Delivery form	Width [mm]	Length [mm]
isovac 600-50 A HC	Wide strip / Slit strip	19 – 1590	-
	Cut-to-length sheets	300 – 1590	300 – 5000

Deliverable coating systems

Grade named according to isovac®	Uncoated	C-3	Backlack	C-5	C-6
isovac 600-50 A HC	✔	✔	☰	✔	✔

✔ Available ☰ On request

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