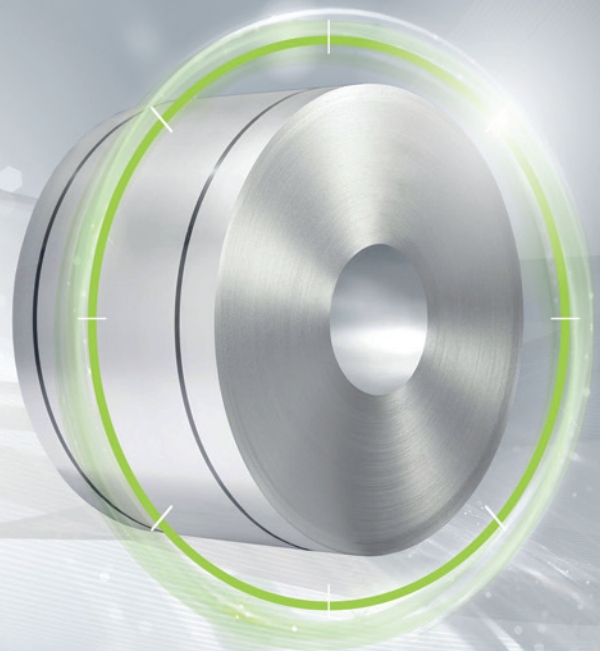


FULLY
PROCESSED

isovac high-perm 530-50 A HC

The specialist for high permeability 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. Its high thermal conductivity and optimized texture make isovac HP 530-50 A HC (high-perm/high-conductivity) ensure rapid heat dissipation in combination with increased magnetizability and low specific total loss. This makes innovative design strategies possible for electrical machinery.

Upon request, isovac HP 530-50 A HC can be supplied with an electrical steel insulation system and can be used directly in as-delivered condition.

Convincing advantages:

- » Lower cooling power necessary through higher thermal conductivity than that of standard isovac® grades (conductivity increased by up to 20%)
- » Increased performance achieved by increasing torque based on higher magnetizability (improvement by up to 0.05 T at J25, J50, J100)
- » 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 HP 530-50 A HC, an electrical steel of the highest quality. We offer you a customer-focused overall 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 HP 530-50 A HC	1.0813	M530-50A	M530-50A 5	50A530	2212	-	M-45	50C530	50W540

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 HP 530-50 A HC	255	235	375	31	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 1.5 T μ_r [-]
	1.0 T P10		1.5 T P15		2500 A/m J25	5000 A/m J50	10000 A/m J100	
	50 Hz [W/kg]	60 Hz [W/lb]	50 Hz [W/kg]	60 Hz [W/lb]	[T]	[T]	[T]	
isovac HP 530-50 A HC	2.10	1.20	4.40	2.51	1.71	1.79	1.89	3800

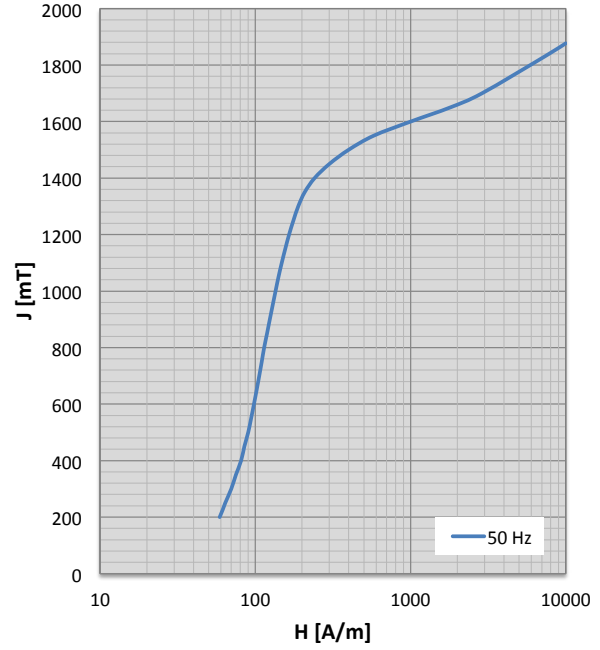
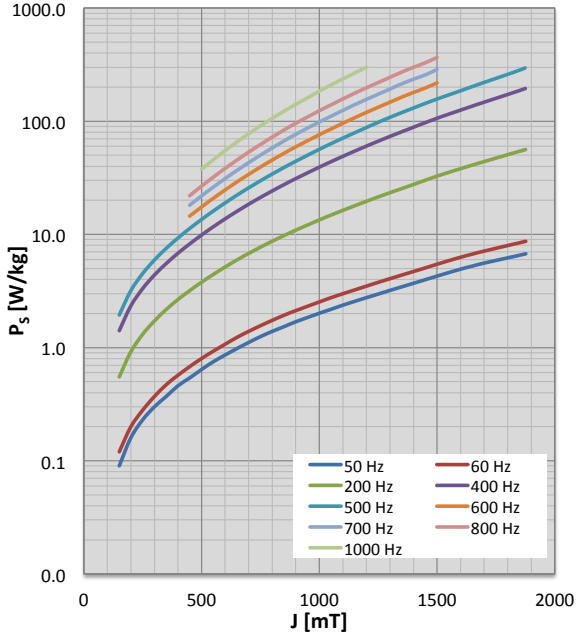
Physical properties:

Typical values

Grade named according to isovac®	Density ρ [g/cm³]	Specific electrical resistance ρ_s [$\mu\Omega\text{cm}$]	Thermal conductivity λ [W/mK]
isovac HP 530-50 A HC	7.80	28.2	42

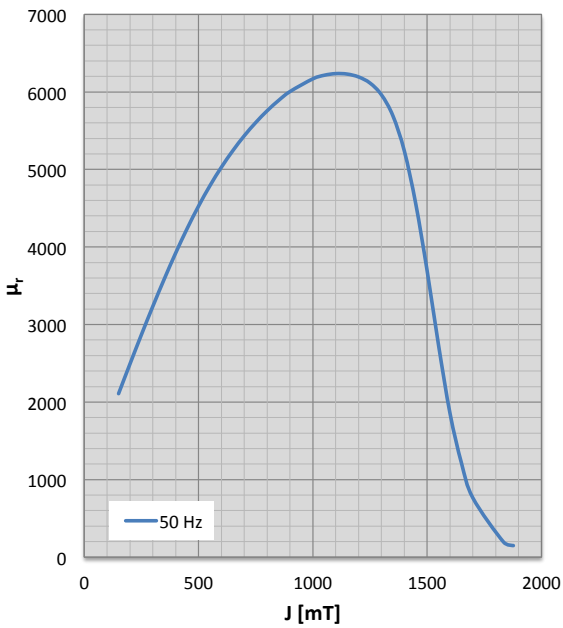
Characteristics P_s/J loss curve and characteristics J/H magnetization curve

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	47	0.04	1717	100	49	0.18	1631
150	53	0.09	2110	150	53	0.12	2094	150	58	0.55	1915
200	59	0.16	2493	200	59	0.20	2468	200	66	0.92	2196
250	64	0.23	2870	250	65	0.28	2835	250	74	1.31	2470
300	70	0.30	3236	300	71	0.37	3192	300	82	1.72	2732
350	75	0.37	3588	350	76	0.47	3535	350	90	2.17	2979
400	81	0.46	3924	400	82	0.57	3861	400	98	2.66	3208
450	85	0.54	4238	450	87	0.68	4167	450	106	3.19	3415
500	90	0.64	4528	500	92	0.80	4448	500	113	3.78	3596
550	94	0.75	4792	550	96	0.93	4703	550	120	4.43	3747
600	98	0.86	5030	600	100	1.07	4932	600	127	5.15	3872
650	102	0.98	5243	650	104	1.23	5138	650	134	5.94	3970
700	106	1.11	5435	700	108	1.39	5320	700	141	6.79	4045
750	110	1.25	5605	750	112	1.56	5482	750	149	7.71	4098
800	114	1.39	5757	800	117	1.74	5624	800	157	8.70	4131
850	119	1.53	5890	850	121	1.93	5749	850	166	9.76	4147
900	124	1.69	6005	900	126	2.12	5854	900	176	10.90	4147
1000	135	2.01	6169	1000	138	2.53	6003	1000	197	13.42	4109
1050	141	2.18	6215	1050	144	2.76	6045	1050	208	14.82	4075
1100	148	2.37	6236	1100	151	2.99	6065	1100	219	16.31	4036
1150	156	2.56	6230	1150	159	3.23	6062	1150	231	17.89	3993
1200	165	2.76	6193	1200	168	3.49	6023	1200	244	19.59	3943
1250	176	2.97	6114	1250	179	3.77	5939	1250	259	21.42	3885
1300	189	3.20	5962	1300	193	4.06	5806	1300	271	23.35	3836
1350	208	3.44	5692	1350	210	4.37	5605	1350	282	25.38	3792
1400	241	3.70	5239	1400	241	4.70	5219	1400	306	27.61	3659
1450	300	3.98	4557	1450	300	5.06	4554	1450	360	30.09	3352
1500	399	4.28	3689	1500	399	5.45	3677	1500	446	32.71	2908
1550	579	4.60	2728	1550	580	5.86	2715	1550	604	35.34	2394
1600	1002	4.93	1852	1600	1003	6.28	1845	1600	1006	38.06	1864
1650	1801	5.25	1213	1650	1797	6.70	1210	1650	1796	40.96	1360
1700	2885	5.58	763	1700	2875	7.12	763	1700	2885	43.99	879
1834	7500	6.43	195	1834	7500	8.28	195	1833	7500	52.98	194
1877	10000	6.74	149	1877	10000	8.69	149	1876	10000	56.17	149

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	55	0.51	1465	100	58	0.73	1390				
150	65	1.41	1693	150	68	1.94	1604				
200	75	2.34	1917	200	79	3.19	1812				
250	86	3.32	2131	250	90	4.51	2012				
300	96	4.38	2333	300	102	5.94	2197				
350	107	5.53	2516	350	113	7.53	2363				
400	117	6.82	2678	400	125	9.29	2506	400	134	11.68	2405
450	128	8.25	2813	450	138	11.29	2621	450	147	14.47	2479
500	139	9.87	2917	500	150	13.54	2704	500	160	17.46	2534
550	151	11.68	2988	550	164	16.09	2750	550	174	20.85	2556
600	163	13.71	3027	600	178	18.97	2765	600	191	24.69	2548
650	175	15.96	3041	650	193	22.18	2754	650	209	29.03	2515
700	188	18.46	3033	700	210	25.77	2722	700	229	33.90	2465
750	203	21.20	3007	750	227	29.74	2676	750	251	39.34	2404
800	218	24.21	2969	800	246	34.13	2621	800	274	45.37	2339
850	235	27.50	2922	850	267	38.96	2562	850	299	52.04	2275
900	253	31.09	2868	900	289	44.26	2501	900	325	59.35	2214
1000	292	39.26	2750	1000	337	56.42	2378	1000	380	75.89	2099
1050	313	43.90	2689	1050	362	63.35	2317	1050	410	85.36	2042
1100	335	48.92	2627	1100	389	70.86	2257	1100	443	95.88	1982
1150	359	54.36	2565	1150	418	78.98	2197	1150	477	107.28	1924
1200	383	60.24	2505	1200	448	87.89	2138	1200	512	119.52	1870
1250	407	66.58	2448	1250	480	97.71	2079	1250	548	132.69	1817
1300	435	73.36	2386	1300	514	108.18	2018	1300	587	147.16	1765
1350	466	80.60	2316	1350	551	119.13	1955	1350	629	163.11	1712
1400	492	88.47	2271	1400	584	130.86	1913	1400	671	179.56	1664
1450	510	97.09	2257	1450	612	143.58	1896	1450	712	196.41	1623
1500	555	106.17	2154	1500	658	156.99	1816	1500	765	218.05	1563
1550	696	115.47	1857	1550	781	170.85	1595				
1600	1093	125.30	1463	1600	1151	185.76	1294				
1650	1871	135.97	1086	1650	1910	202.29	990				
1700	2940	147.28	739	1700	2966	220.06	694				
1832	7500	181.11	194	1824	7500	269.83	194				
1875	10000	194.55	149	1874	10000	295.30	149				

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 [-]
400	141	14.52	2290	400	149	17.61	2173				
450	155	18.05	2344	450	164	21.96	2205	450	184	30.80	1973
500	170	21.86	2380	500	182	26.67	2223	500	205	37.67	1964
550	187	26.18	2385	550	201	32.06	2213	550	229	45.65	1936
600	206	31.10	2362	600	223	38.24	2181	600	256	54.90	1890
650	227	36.69	2317	650	247	45.29	2130	650	286	65.49	1833
700	250	43.01	2258	700	273	53.28	2067	700	319	77.46	1768
750	275	50.11	2191	750	301	62.27	1999	750	354	90.90	1700
800	302	58.05	2122	800	332	72.34	1931	800	391	105.86	1635
850	330	66.88	2058	850	363	83.54	1867	850	430	122.43	1575
900	360	76.57	1997	900	397	95.85	1808	900	472	140.81	1520
1000	424	98.33	1881	1000	470	123.66	1696	1000	562	183.93	1418
1050	459	110.72	1825	1050	510	139.55	1642	1050	611	208.94	1370
1100	496	124.58	1770	1100	551	157.30	1592	1100	663	236.24	1323
1150	534	139.64	1717	1150	594	176.53	1543	1150	717	266.13	1279
1200	574	155.78	1666	1200	639	197.20	1496	1200	775	299.27	1235
1250	616	173.11	1618	1250	686	219.46	1451	1250	839	335.97	1190
1300	660	192.37	1569	1300	736	244.07	1408				
1350	708	213.83	1520	1350	788	271.37	1365				
1400	755	235.30	1478	1400	843	299.36	1324				
1450	799	256.37	1445	1450	900	327.80	1282				
1500	862	286.21	1387	1500	974	365.58	1227				

Available Dimensions

Grade named according to isovac®	Delivery form	Width [mm]	Length [mm]
isovac HP 530-50 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 HP 530-50 A HC	✔	✔	☰	✔	✔

✔ Available ☰ On request

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