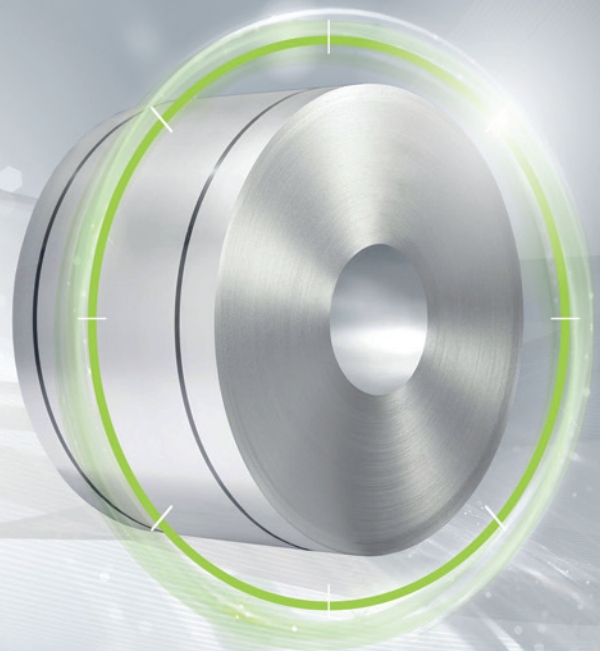


FULLY  
PROCESSED

## isovac 350-50 A

### The perfect solution for direct application

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. Upon request, isovac 350-50 A can be supplied with an electrical steel insulation system and can be used directly in as-delivered condition.

#### Convincing advantages:

- » 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 350-50 A, 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 350-50 A	1.0810	M350-50A	M350-50A 5	50A350	2411	47F200	M-36	50C350	50W350

**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	0.2 %-Yield strength	Tensile strength	Elongation	Hardness
	R <sub>eH</sub> [MPa]	R <sub>p0.2</sub> [MPa]	R <sub>m</sub> [MPa]	A <sub>80</sub> [%]	HV5 [-]
isovac 350-50 A	325	310	470	32	165

**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 <sub>r</sub>
	50 Hz [W/kg]	60 Hz [W/lb]	50 Hz [W/kg]	60 Hz [W/lb]	[T]	[T]	[T]	[-]
isovac 350-50 A	1.30	0.74	3.10	1.77	1.58	1.66	1.78	1300

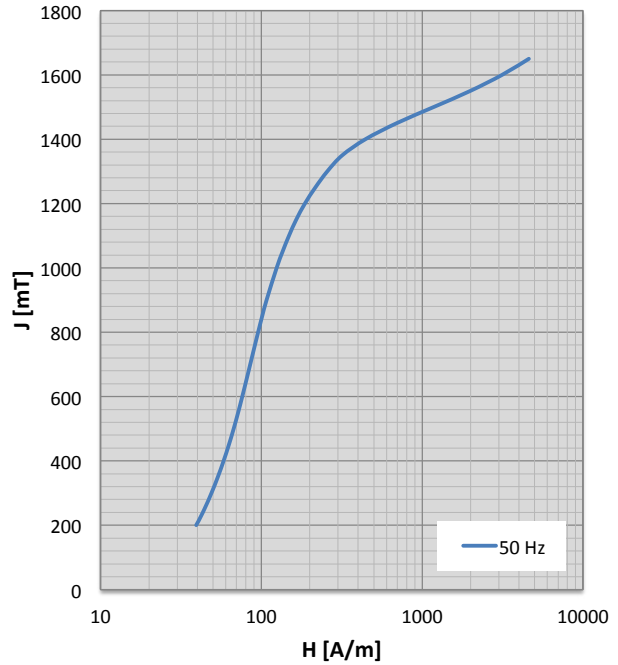
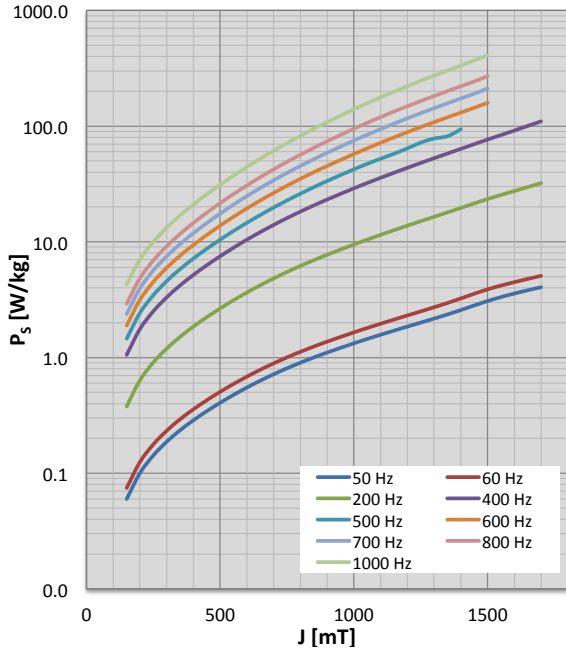
**Physical properties:**

Typical values

Grade named according to isovac®	Density	Specific electrical resistance	Thermal conductivity
	ρ [g/cm³]	ρ <sub>s</sub> [μΩcm]	λ [W/mK]
isovac 350-50 A	7.71	45.0	28

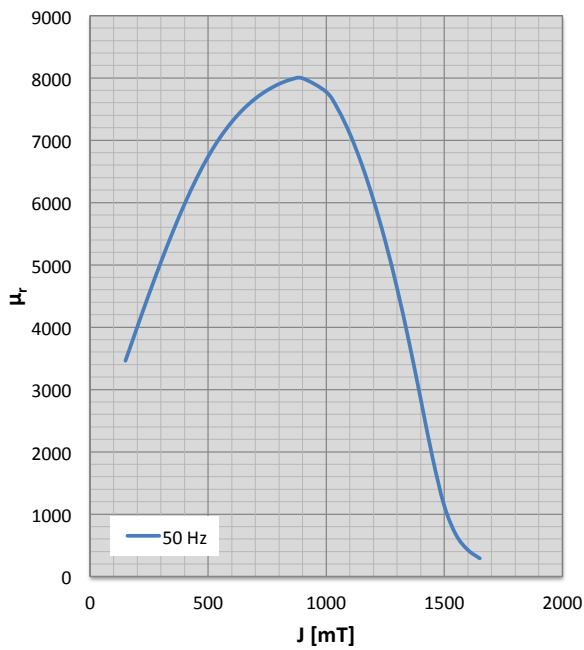
**Characteristics  $P_s/J$  loss curve and characteristics  $J/H$  magnetization curve**

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



**Characteristics  $\mu_r/J$  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 <sub>s</sub> [W/kg]	μ <sub>r</sub> [-]	J [mT]	H [A/m]	P <sub>s</sub> [W/kg]	μ <sub>r</sub> [-]	J [mT]	H [A/m]	P <sub>s</sub> [W/kg]	μ <sub>r</sub> [-]
								100	34	0.13	2632
150	35	0.06	3459	150	37	0.07	3347	150	41	0.38	2966
200	39	0.10	4004	200	42	0.12	3870	200	48	0.64	3297
250	44	0.14	4535	250	47	0.18	4382	250	55	0.91	3618
300	49	0.19	5045	300	52	0.23	4876	300	62	1.19	3926
350	54	0.23	5527	350	57	0.29	5347	350	68	1.51	4217
400	58	0.29	5975	400	62	0.36	5789	400	75	1.85	4486
450	63	0.34	6381	450	66	0.43	6197	450	81	2.23	4728
500	67	0.41	6738	500	71	0.51	6564	500	87	2.66	4939
550	72	0.48	7041	550	75	0.59	6886	550	93	3.13	5117
600	76	0.55	7294	600	79	0.68	7166	600	99	3.65	5260
650	81	0.63	7502	650	83	0.78	7408	650	105	4.22	5373
700	85	0.72	7670	700	87	0.89	7616	700	111	4.83	5456
750	90	0.81	7802	750	92	1.00	7793	750	117	5.49	5512
800	95	0.90	7903	800	96	1.12	7945	800	123	6.19	5543
850	101	1.00	7974	850	101	1.24	8072	850	130	6.94	5549
900	108	1.10	7993	900	107	1.37	8163	900	138	7.73	5535
1000	124	1.33	7775	1000	120	1.65	8184	1000	154	9.48	5451
1050	135	1.45	7494	1050	129	1.80	8078	1050	164	10.45	5382
1100	148	1.57	7103	1100	139	1.96	7829	1100	174	11.49	5281
1150	165	1.71	6615	1150	152	2.13	7390	1150	186	12.61	5140
1200	186	1.85	6039	1200	171	2.31	6782	1200	202	13.80	4979
1250	217	2.00	5377	1250	199	2.50	6037	1250	224	15.08	4799
1300	257	2.17	4622	1300	236	2.72	5155	1300	253	16.45	4485
1350	318	2.36	3771	1350	294	2.96	4141	1350	300	17.96	3922
1400	444	2.57	2845	1400	421	3.24	3051	1400	418	19.62	3086
1450	695	2.82	1906	1450	685	3.56	1984	1450	680	21.48	2046
1500	1178	3.08	1130	1500	1186	3.88	1132	1500	1187	23.43	1130
1550	1989	3.33	664	1550	2021	4.19	646	1550	2031	25.40	627
1600	3140	3.57	424	1600	3216	4.48	414	1600	3237	27.46	412
1650	4607	3.81	291	1650	4760	4.78	287	1650	4788	29.73	295
1700	6294	4.05	218	1700	6552	5.08	214	1700	6585	32.16	220

**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 <sub>s</sub> [W/kg]	μ <sub>r</sub> [-]	J [mT]	H [A/m]	P <sub>s</sub> [W/kg]	μ <sub>r</sub> [-]	J [mT]	H [A/m]	P <sub>s</sub> [W/kg]	μ <sub>r</sub> [-]
100	38	0.37	2234	100	38	0.51	2208	100	40	0.67	2077
150	48	1.05	2474	150	48	1.45	2415	150	51	1.89	2264
200	57	1.76	2710	200	58	2.43	2619	200	62	3.15	2446
250	66	2.51	2938	250	68	3.46	2813	250	73	4.50	2620
300	75	3.31	3152	300	78	4.58	2995	300	84	5.96	2780
350	84	4.20	3349	350	88	5.80	3158	350	95	7.58	2923
400	93	5.18	3524	400	98	7.17	3300	400	106	9.40	3045
450	103	6.27	3673	450	109	8.71	3416	450	118	11.46	3140
500	112	7.50	3791	500	119	10.45	3500	500	130	13.80	3205
550	120	8.89	3876	550	130	12.41	3552	550	142	16.45	3237
600	129	10.43	3929	600	141	14.60	3572	600	155	19.44	3239
650	139	12.14	3956	650	153	17.05	3567	650	168	22.78	3217
700	148	14.00	3959	700	165	19.77	3541	700	182	26.48	3178
750	158	16.04	3944	750	177	22.77	3498	750	196	30.56	3125
800	169	18.25	3913	800	190	26.06	3443	800	212	35.03	3065
850	181	20.63	3870	850	203	29.65	3380	850	229	39.92	3003
900	193	23.20	3819	900	218	33.56	3313	900	247	45.25	2938
1000	219	28.99	3699	1000	254	42.34	3176	1000	286	57.41	2804
1050	234	32.24	3635	1050	274	47.20	3113	1050	308	64.30	2734
1100	249	35.75	3566	1100	288	52.30	3059	1100	330	71.80	2664
1150	265	39.54	3490	1150	295	57.72	3010	1150	353	79.94	2598
1200	282	43.62	3419	1200	329	64.25	2915	1200	379	88.69	2528
1250	299	48.05	3356	1250	400	72.03	2768	1250	410	98.06	2454
1300	320	52.82	3252	1300	373	78.13	2773	1300	432	108.17	2398
1350	357	57.97	3035	1350	225	81.85	2939	1350	444	119.16	2349
1400	463	63.62	2586	1400	495	94.48	2328	1400	523	131.06	2147
1450	708	69.85	1855	1450	1376	118.95	657	1450	755	144.08	1674
1500	1203	76.57	1119					1500	1183	159.06	1133
1550	2048	83.72	653								
1600	3263	91.58	409								
1650	4829	100.41	275								
1700	6642	109.96	204								



### Available Dimensions

Grade named according to isovac®	Delivery form	Width [mm]	Length [mm]
isovac 350-50 A	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 350-50 A	✔	✔	☰	✔	✔

✔ Available ☰ On request

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