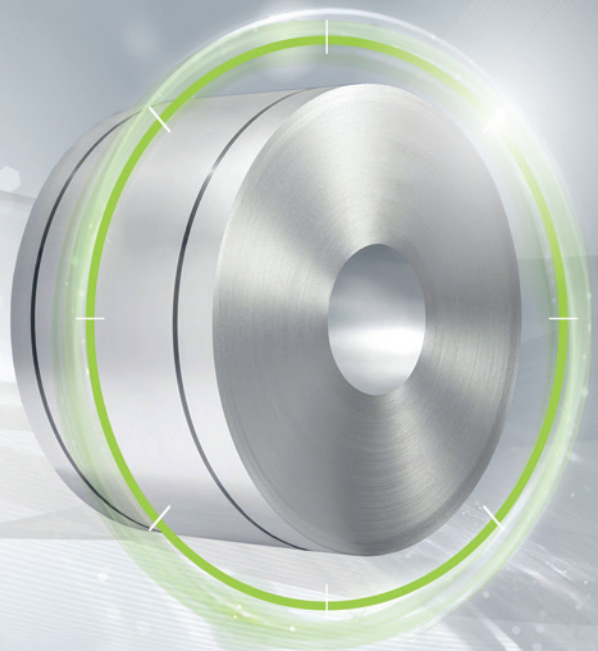


FULLY
PROCESSED

isovac 310-50 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 310-50 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 310-50 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 310-50 A	1.0808	M310-50A	M310-50A 5	50A310	2412	47F180	M-22	50C310	50W310

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 _{eH} [MPa]	R _{p0.2} [MPa]	R _m [MPa]	A ₈₀ [%]	HV5 [-]
isovac 310-50 A	360	355	490	26	185

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 310-50 A	1.10	0.63	2.70	1.54	1.57	1.66	1.78	1200

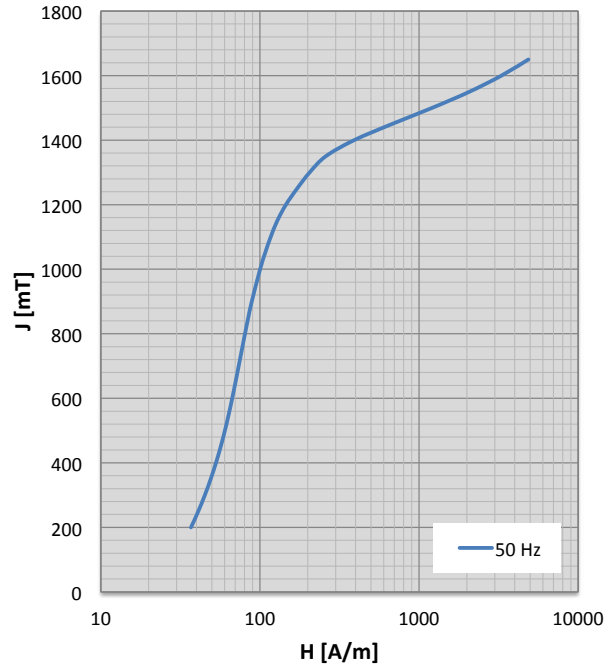
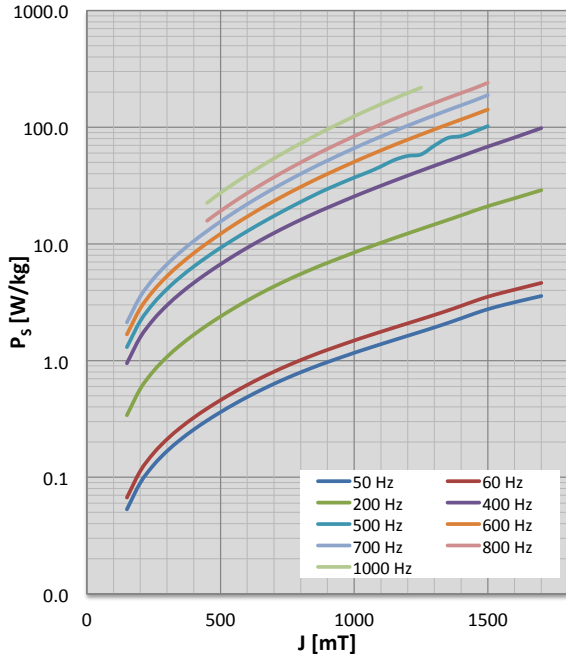
Physical properties:

Typical values

Grade named according to isovac®	Density ρ [g/cm³]	Specific electrical resistance ρ _s [μΩcm]	Thermal conductivity λ [W/mK]
isovac 310-50 A	7.68	52.0	25

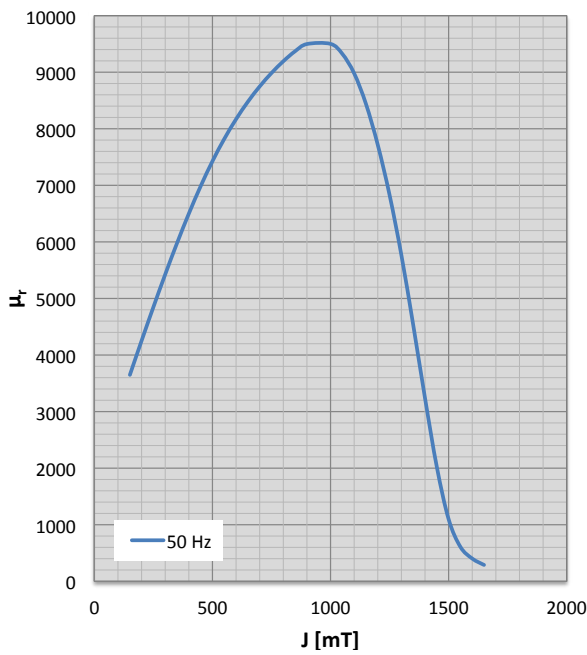
Characteristics P_s/J loss curve and characteristics J/H magnetization curve

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	31	0.11	2805
150	33	0.05	3648	150	33	0.07	3621	150	37	0.34	3189
200	37	0.09	4256	200	38	0.11	4190	200	43	0.57	3568
250	41	0.13	4851	250	42	0.16	4747	250	49	0.82	3938
300	45	0.17	5428	300	46	0.21	5286	300	55	1.08	4294
350	49	0.21	5980	350	51	0.27	5803	350	61	1.36	4632
400	53	0.26	6501	400	55	0.32	6292	400	67	1.67	4947
450	57	0.31	6986	450	59	0.39	6746	450	72	2.01	5235
500	60	0.36	7427	500	62	0.46	7160	500	77	2.39	5490
550	64	0.42	7822	550	66	0.53	7530	550	82	2.81	5709
600	67	0.49	8171	600	69	0.62	7858	600	87	3.27	5893
650	70	0.56	8478	650	73	0.71	8148	650	92	3.77	6043
700	74	0.63	8749	700	76	0.80	8402	700	97	4.32	6160
750	77	0.71	8986	750	80	0.90	8625	750	102	4.90	6246
800	81	0.79	9194	800	83	1.01	8820	800	107	5.52	6302
850	85	0.88	9371	850	87	1.12	8987	850	113	6.18	6329
900	89	0.97	9498	900	92	1.24	9117	900	119	6.88	6331
1000	100	1.16	9501	1000	102	1.49	9214	1000	133	8.43	6272
1050	108	1.27	9324	1050	109	1.62	9142	1050	140	9.29	6213
1100	117	1.38	8980	1100	118	1.77	8900	1100	149	10.21	6109
1150	129	1.50	8439	1150	129	1.92	8420	1150	159	11.21	5946
1200	146	1.63	7716	1200	146	2.08	7725	1200	173	12.28	5760
1250	171	1.77	6829	1250	171	2.26	6850	1250	192	13.43	5556
1300	206	1.92	5767	1300	205	2.46	5792	1300	218	14.68	5150
1350	259	2.10	4535	1350	258	2.68	4559	1350	262	16.04	4375
1400	391	2.30	3239	1400	388	2.94	3258	1400	386	17.56	3299
1450	677	2.53	2024	1450	673	3.23	2036	1450	668	19.26	2096
1500	1210	2.76	1099	1500	1206	3.53	1102	1500	1207	21.03	1103
1550	2075	2.96	608	1550	2074	3.79	609	1550	2085	22.77	592
1600	3299	3.16	402	1600	3298	4.05	402	1600	3322	24.61	398
1650	4869	3.36	289	1650	4862	4.33	290	1650	4895	26.65	294
1700	6683	3.58	217	1700	6668	4.63	217	1700	6705	28.87	221

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	34	0.33	2455	100	34	0.45	2420				
150	43	0.95	2730	150	43	1.30	2665	150	45	1.68	2535
200	51	1.59	3000	200	52	2.18	2905	200	54	2.80	2750
250	59	2.26	3262	250	61	3.11	3135	250	64	3.99	2956
300	67	2.98	3509	300	69	4.10	3350	300	73	5.29	3146
350	75	3.77	3738	350	78	5.19	3546	350	83	6.73	3317
400	83	4.64	3944	400	87	6.40	3718	400	93	8.33	3463
450	90	5.61	4122	450	96	7.74	3860	450	102	10.14	3580
500	98	6.69	4269	500	104	9.25	3968	500	113	12.20	3662
550	106	7.91	4379	550	113	10.95	4039	550	123	14.52	3706
600	113	9.27	4457	600	122	12.85	4075	600	134	17.14	3717
650	121	10.76	4504	650	132	14.97	4081	650	145	20.06	3699
700	129	12.39	4524	700	142	17.35	4063	700	157	23.30	3660
750	137	14.17	4522	750	152	19.99	4024	750	169	26.87	3603
800	146	16.10	4499	800	164	22.91	3969	800	183	30.80	3537
850	156	18.18	4460	850	177	26.13	3903	850	198	35.09	3464
900	166	20.43	4408	900	190	29.60	3831	900	214	39.79	3388
1000	189	25.51	4279	1000	218	37.02	3685	1000	248	50.51	3227
1050	201	28.38	4208	1050	232	41.03	3614	1050	267	56.61	3145
1100	214	31.49	4128	1100	251	46.09	3515	1100	287	63.26	3063
1150	228	34.84	4037	1150	273	52.37	3385	1150	308	70.47	2982
1200	243	38.48	3953	1200	287	56.75	3342	1200	330	78.24	2901
1250	260	42.44	3879	1250	287	58.45	3417	1250	353	86.58	2820
1300	276	46.73	3757	1300	329	69.53	3153	1300	378	95.74	2743
1350	304	51.36	3492	1350	356	80.84	2855	1350	394	105.71	2666
1400	410	56.48	2926	1400	441	83.94	2613	1400	469	116.43	2402
1450	677	62.17	1999	1450	772	91.97	1792	1450	724	128.29	1781
1500	1204	68.26	1100	1500	1223	102.21	1074	1500	1198	141.77	1114
1550	2075	74.62	605								
1600	3312	81.62	400								
1650	4897	89.57	288								
1700	6727	98.24	216								

Available Dimensions

Grade named according to isovac®	Delivery form	Width [mm]	Length [mm]
isovac 310-50 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 310-50 A	✔	✔	☰	✔	✔

✔ Available ☰ On request

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