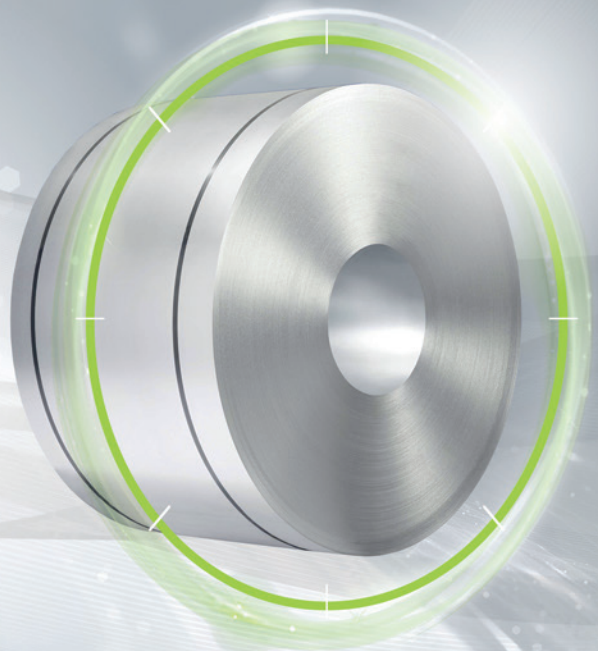


FULLY  
PROCESSED

## isovac 330-35 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 330-35 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 330-35 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 330-35 A	1.0804	M330-35A	M330-35A 5	35A330	-	36F185	M-36	35C330	35W330

**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 330-35 A	350	335	490	30	150

**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 330-35 A	1.20	0.67	2.80	1.57	1.57	1.66	1.79	1100

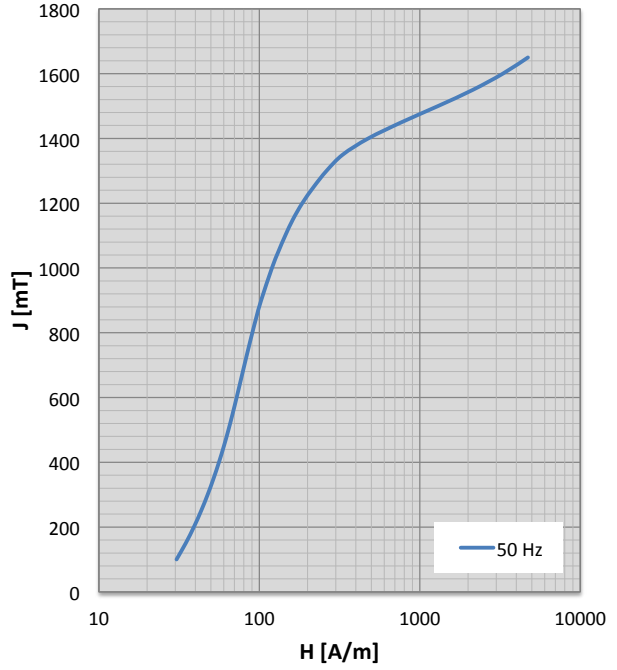
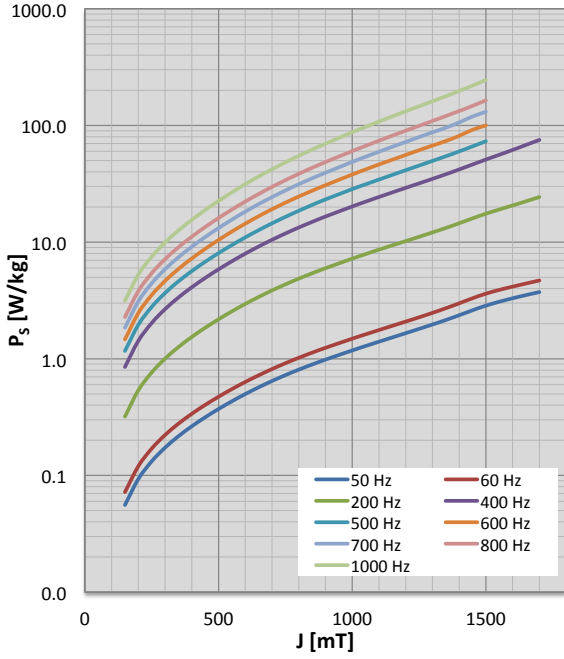
**Physical properties:**

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 330-35 A	7.71	45.0	28

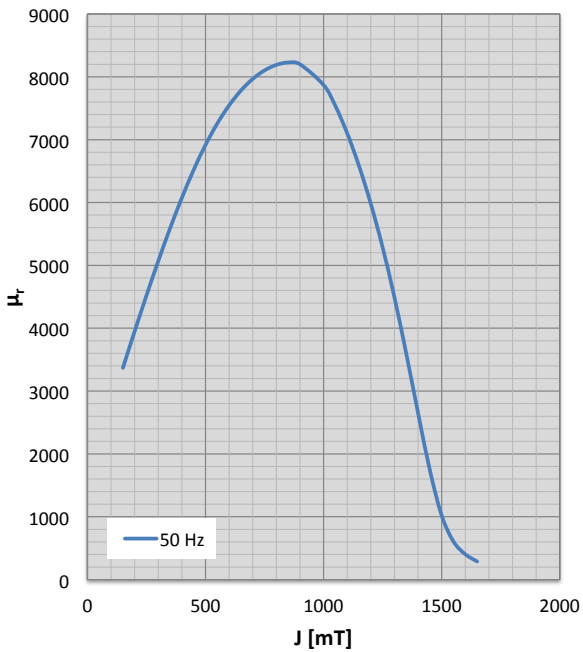
**Characteristics  $P_s/J$  loss curve and characteristics  $J/H$  magnetization curve**

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	30	0.02	2780	100	34	0.02	2513	100	35	0.11	2476
150	35	0.06	3370	150	39	0.07	3067	150	40	0.32	2903
200	39	0.09	3953	200	44	0.12	3616	200	46	0.54	3327
250	43	0.13	4522	250	48	0.17	4154	250	52	0.76	3741
300	48	0.17	5071	300	53	0.22	4678	300	58	1.00	4143
350	52	0.22	5591	350	57	0.28	5180	350	63	1.26	4529
400	56	0.26	6077	400	62	0.34	5658	400	69	1.54	4893
450	60	0.32	6521	450	66	0.40	6104	450	74	1.84	5233
500	64	0.37	6917	500	70	0.47	6515	500	78	2.18	5543
550	68	0.43	7259	550	74	0.55	6886	550	83	2.55	5820
600	72	0.50	7547	600	78	0.63	7215	600	87	2.95	6066
650	76	0.57	7782	650	81	0.72	7505	650	92	3.39	6283
700	81	0.65	7967	700	85	0.82	7753	700	96	3.85	6473
750	85	0.72	8103	750	89	0.92	7961	750	100	4.34	6638
800	90	0.81	8190	800	94	1.02	8129	800	105	4.86	6780
850	96	0.89	8228	850	99	1.13	8254	850	110	5.40	6900
900	103	0.98	8200	900	104	1.24	8321	900	115	5.97	6992
1000	120	1.18	7869	1000	119	1.49	8214	1000	129	7.21	7070
1050	131	1.29	7536	1050	128	1.62	8006	1050	137	7.89	7045
1100	145	1.40	7101	1100	139	1.76	7674	1100	146	8.61	6991
1150	162	1.52	6582	1150	153	1.92	7206	1150	157	9.38	6890
1200	185	1.66	5978	1200	173	2.08	6600	1200	174	10.21	6592
1250	218	1.80	5286	1250	203	2.27	5854	1250	202	11.10	5961
1300	262	1.97	4492	1300	244	2.47	4958	1300	240	12.10	5050
1350	331	2.15	3597	1350	309	2.71	3919	1350	305	13.22	3976
1400	477	2.36	2652	1400	457	2.99	2829	1400	455	14.50	2858
1450	770	2.60	1741	1450	760	3.30	1809	1450	759	15.98	1819
1500	1300	2.85	1021	1500	1311	3.61	1023	1500	1311	17.51	1024
1550	2142	3.08	606	1550	2189	3.89	589	1550	2192	19.02	588
1600	3294	3.30	404	1600	3408	4.15	391	1600	3414	20.61	391
1650	4721	3.51	289	1650	4947	4.42	281	1650	4955	22.38	281
1700	6338	3.73	221	1700	6711	4.69	213	1700	6720	24.30	213

**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	37	0.29	2262								
150	45	0.85	2588	150	45	1.17	2525	150	47	1.47	2438
200	52	1.43	2911	200	53	1.96	2813	200	55	2.47	2710
250	59	2.03	3227	250	61	2.78	3095	250	63	3.52	2974
300	66	2.66	3532	300	69	3.66	3368	300	71	4.65	3227
350	73	3.35	3824	350	76	4.61	3628	350	80	5.88	3466
400	80	4.10	4099	400	84	5.64	3873	400	87	7.24	3686
450	86	4.93	4353	450	91	6.78	4099	450	95	8.75	3885
500	92	5.84	4584	500	97	8.04	4303	500	103	10.43	4059
550	98	6.85	4787	550	103	9.44	4483	550	110	12.32	4205
600	103	7.96	4965	600	109	10.98	4637	600	117	14.40	4323
650	109	9.17	5116	650	115	12.66	4766	650	124	16.67	4417
700	114	10.47	5241	700	121	14.48	4869	700	131	19.13	4487
750	119	11.86	5341	750	127	16.45	4944	750	138	21.76	4537
800	125	13.33	5417	800	134	18.56	4992	800	146	24.58	4567
850	131	14.90	5469	850	141	20.82	5014	850	153	27.56	4579
900	138	16.56	5498	900	149	23.22	5015	900	162	30.76	4573
1000	153	20.21	5487	1000	165	28.45	4980	1000	182	37.94	4501
1050	162	22.21	5445	1050	174	31.29	4952	1050	193	41.98	4439
1100	172	24.36	5358	1100	184	34.35	4897	1100	204	46.29	4379
1150	184	26.67	5218	1150	195	37.69	4796	1150	214	50.85	4327
1200	201	29.16	5056	1200	213	41.33	4634	1200	230	55.83	4219
1250	223	31.86	4876	1250	241	45.28	4399	1250	258	61.35	4006
1300	255	34.82	4521	1300	270	49.61	4077	1300	285	67.20	3760
1350	308	38.14	3845	1350	309	54.41	3626	1350	315	73.44	3501
1400	448	41.93	2913	1400	446	59.88	2911	1400	445	81.46	2940
1450	754	46.26	1877	1450	778	66.18	1886	1450	771	91.77	1912
1500	1314	51.00	1021	1500	1357	73.17	971	1500	1305	100.06	1031
1550	2204	56.03	570	1550	2228	80.80	532				
1600	3435	61.63	388	1600	3433	89.48	390				
1650	4982	68.06	287	1650	4981	99.51	306				
1700	6750	75.11	218	1700	6775	110.54	231				

**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 <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	0.62	2192					100	42	1.08	1932
150	47	1.85	2436	150	51	2.28	2182	150	53	3.15	2139
200	56	3.11	2676	200	60	3.81	2429	200	63	5.27	2342
250	65	4.43	2909	250	69	5.42	2670	250	74	7.51	2538
300	74	5.86	3132	300	79	7.15	2898	300	84	9.92	2723
350	83	7.41	3342	350	88	9.04	3111	350	94	12.58	2895
400	92	9.13	3534	400	96	11.14	3305	400	105	15.52	3048
450	100	11.05	3705	450	105	13.47	3476	450	115	18.82	3180
500	108	13.19	3852	500	114	16.09	3619	500	125	22.53	3287
550	116	15.59	3973	550	122	19.02	3732	550	135	26.71	3366
600	124	18.25	4068	600	131	22.27	3818	600	145	31.36	3420
650	132	21.16	4140	650	139	25.84	3877	650	155	36.50	3450
700	140	24.31	4190	700	148	29.73	3914	700	166	42.13	3460
750	148	27.70	4221	750	157	33.94	3930	750	178	48.26	3453
800	156	31.33	4233	800	167	38.47	3929	800	190	54.90	3431
850	165	35.19	4230	850	177	43.32	3913	850	203	62.06	3397
900	175	39.33	4212	900	188	48.54	3883	900	217	69.81	3353
1000	197	48.63	4129	1000	213	60.25	3790	1000	248	87.27	3241
1050	210	53.88	4067	1050	227	66.83	3729	1050	266	97.13	3176
1100	222	59.53	4003	1100	242	73.99	3658	1100	284	107.84	3105
1150	234	65.60	3941	1150	257	81.75	3578	1150	303	119.50	3030
1200	250	72.22	3851	1200	274	90.14	3503	1200	324	132.17	2957
1250	274	79.49	3706	1250	293	99.20	3436	1250	348	145.96	2890
1300	298	87.23	3521	1300	313	109.17	3322	1300	370	161.09	2805
1350	334	95.58	3275	1350	346	120.33	3081	1350	399	177.90	2650
1400	458	106.08	2755	1400	470	132.83	2577	1400	504	197.05	2296
1450	759	119.31	1851	1450	768	147.01	1770	1450	767	219.23	1675
1500	1305	130.77	1034	1500	1292	164.16	1049	1500	1268	244.85	1056

Available Dimensions

Grade named according to isovac®	Delivery form	Width [mm]	Length [mm]
isovac 330-35 A	Wide strip / Slit strip	19 – 1420	-
	Cut-to-length sheets	300 – 1420	300 – 5000

Deliverable coating systems

Grade named according to isovac®	Uncoated	C-3	Backlack	C-5	C-6
isovac 330-35 A	✔	✔	☰	✔	✔

✔ Available ☰ On request

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