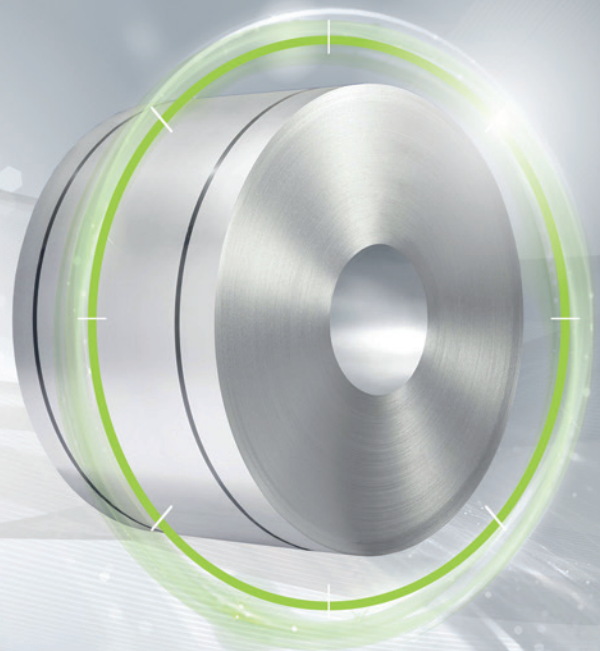


FULLY
PROCESSED

isovac 350-65 A HS

The specialist for high mechanical requirements

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.

Both magnetic and mechanical properties play an important role in many modern high-speed motors or large electric machinery. The electrical steel in the rotor is especially subject to high mechanical stress, which requires the use of high-strength material. isovac 350-65 A HS by voestalpine combines good magnetic properties with high strengths and can be adapted to special customer requirements. isovac 350-65 A HS is ready to use in as-delivered condition. It is also possible to subsequently anneal the product after punching for partial improvement of specific total losses.

Convincing advantages:

- » As a result of higher strength reduced air gap between rotor and stator or reduced rotor ridge widths in permanently excited synchronous motors possible
- » Possibility of partial subsequent annealing treatment at the customer in order to improve magnetic properties, e.g. in the stator
- » 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: Predestined for use in combination with Backlack

voestalpine supplies isovac 350-65 A HS, 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 350-65 A HS	1.0820	M350-65A	M350-65A 5	65A350	-	64F210	M-19	65C350	65W350

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 350-65 A HS	475	465	600	25	220

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 350-65 A HS	1.30	0.77	3.00	1.77	1.55	1.64	1.76	900

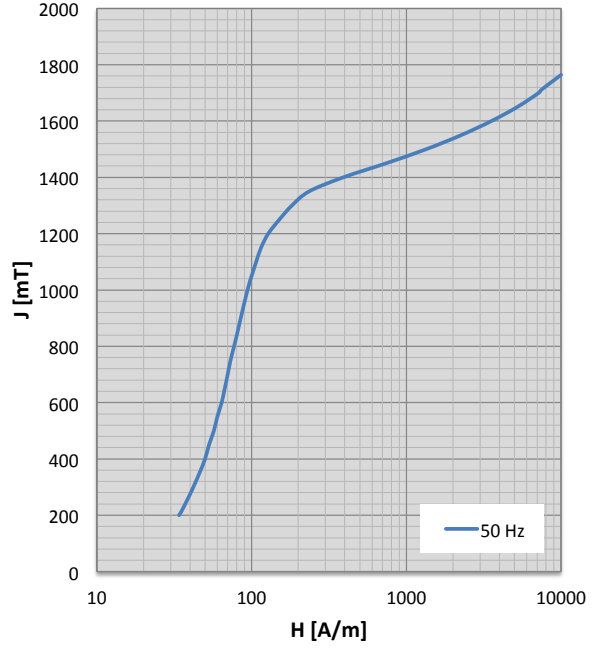
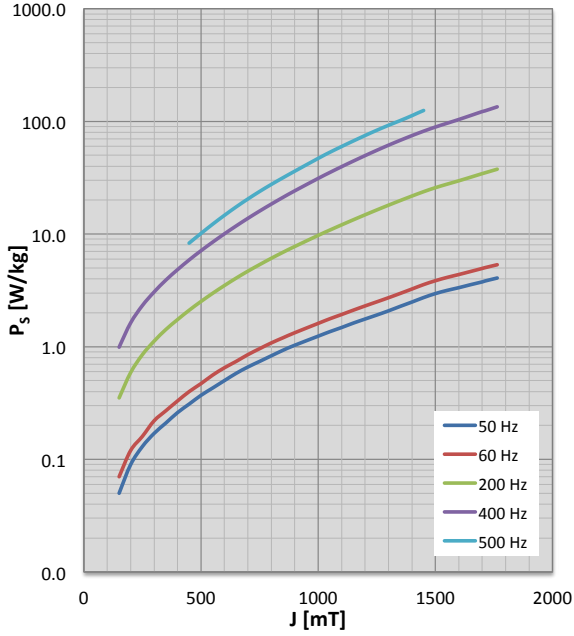
Physical properties:

Typical values

Grade named according to isovac®	Density ρ [g/cm ³]	Specific electrical resistance ρ_s [$\mu\Omega\text{cm}$]	Thermal conductivity λ [W/mK]
isovac 350-65 A HS	7.60	64.5	22

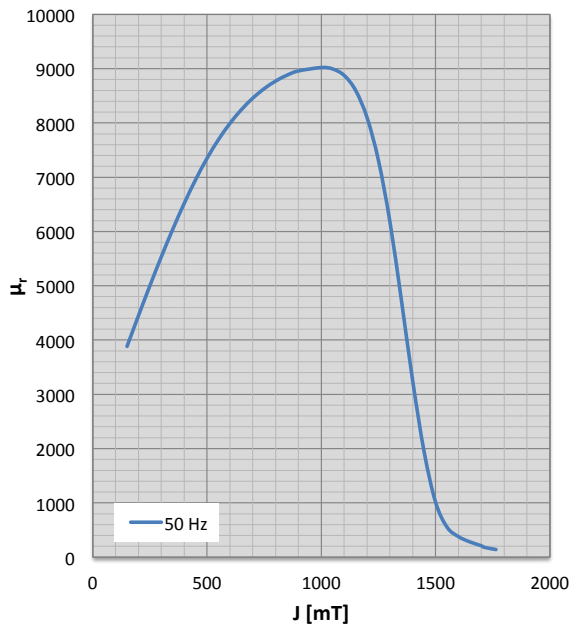
Characteristics P_s/J loss curve and characteristics J/H magnetization curve

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	28	0.12	2923
150	29	0.05	3884	150	30	0.07	3841	150	34	0.35	3284
200	34	0.09	4448	200	34	0.12	4385	200	40	0.59	3640
250	38	0.13	5000	250	38	0.16	4916	250	47	0.85	3983
300	42	0.17	5533	300	43	0.22	5428	300	53	1.12	4308
350	46	0.21	6040	350	47	0.27	5915	350	59	1.42	4610
400	50	0.26	6516	400	51	0.33	6370	400	65	1.74	4881
450	53	0.31	6954	450	54	0.40	6786	450	71	2.11	5117
500	57	0.37	7348	500	58	0.47	7159	500	77	2.52	5310
550	60	0.43	7692	550	62	0.56	7482	550	83	2.98	5457
600	64	0.50	7990	600	65	0.65	7759	600	89	3.49	5561
650	67	0.58	8243	650	68	0.74	7992	650	95	4.06	5626
700	70	0.66	8456	700	72	0.85	8187	700	101	4.68	5658
750	73	0.74	8631	750	75	0.96	8346	750	108	5.35	5662
800	77	0.83	8771	800	79	1.08	8473	800	115	6.09	5642
850	81	0.93	8880	850	83	1.20	8571	850	123	6.89	5602
900	85	1.03	8958	900	87	1.33	8638	900	131	7.75	5546
1000	94	1.24	9020	1000	97	1.61	8660	1000	149	9.73	5393
1050	100	1.36	8994	1050	103	1.77	8608	1050	159	10.85	5300
1100	107	1.48	8875	1100	109	1.93	8503	1100	170	12.06	5193
1150	115	1.62	8600	1150	117	2.11	8319	1150	180	13.38	5073
1200	128	1.76	8099	1200	130	2.30	7947	1200	193	14.81	4969
1250	151	1.91	7307	1250	151	2.50	7268	1250	208	16.36	4880
1300	182	2.08	6181	1300	181	2.72	6212	1300	222	18.03	4664
1350	235	2.28	4744	1350	234	2.97	4784	1350	251	19.82	4162
1400	391	2.49	3238	1400	389	3.25	3257	1400	387	21.74	3286
1450	740	2.73	1935	1450	735	3.56	1940	1450	733	23.77	2073
1500	1344	2.96	1010	1500	1343	3.85	1011	1500	1348	25.79	1004
1550	2262	3.16	552	1550	2271	4.12	551	1550	2282	27.71	507
1600	3546	3.34	378	1600	3565	4.37	376	1600	3580	29.69	374
1650	5217	3.55	281	1650	5236	4.65	280	1650	5257	31.93	301
1700	7167	3.76	210	1700	7177	4.95	210	1700	7207	34.38	227
1712	7500	3.83	182	1713	7500	5.03	182	1711	7500	34.96	182
1764	10000	4.07	140	1764	10000	5.34	140	1763	10000	37.63	140

Frequency dependence of magnetic properties

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

400 Hz				500 Hz			
J [mT]	H [A/m]	P _s [W/kg]	μ _r [-]	J [mT]	H [A/m]	P _s [W/kg]	μ _r [-]
100	33	0.37	2428				
150	41	0.99	2693				
200	49	1.63	2951				
250	57	2.32	3196				
300	65	3.06	3423				
350	74	3.90	3625				
400	82	4.83	3795	400	93	6.63	3477
450	91	5.90	3928	450	103	8.30	3520
500	101	7.11	4017	500	114	10.12	3543
550	110	8.48	4058	550	126	12.24	3529
600	121	10.04	4057	600	139	14.66	3482
650	132	11.80	4022	650	154	17.41	3411
700	143	13.78	3959	700	169	20.47	3325
750	156	15.99	3878	750	186	23.86	3233
800	170	18.44	3786	800	203	27.56	3142
850	184	21.17	3689	850	221	31.61	3058
900	200	24.18	3589	900	241	36.12	2975
1000	236	31.18	3383	1000	287	46.94	2779
1050	256	35.21	3279	1050	313	53.21	2678
1100	276	39.62	3177	1100	337	59.82	2603
1150	296	44.42	3079	1150	359	67.03	2532
1200	321	49.66	2979	1200	391	74.91	2446
1250	352	55.35	2877	1250	435	83.39	2347
1300	370	61.46	2794	1300	448	92.29	2308
1350	376	67.92	2705	1350	420	101.62	2344
1400	472	74.75	2395	1400	520	112.42	2147
1450	774	81.88	1716	1450	890	125.00	1512
1500	1358	89.09	994	1500	1379	135.71	963
1550	2281	96.25	569				
1600	3582	103.93	374				
1650	5261	112.66	265				
1700	7211	122.21	198				
1711	7500	124.05	182				
1763	10000	134.65	140				

Available Dimensions

Grade named according to isovac®	Delivery form	Width [mm]	Length [mm]
isovac 350-65 A HS	Wide strip / Slit strip	19 – 1440	-
	Cut-to-length sheets	300 – 1440	300 – 5000

Deliverable coating systems

Grade named according to isovac®	Uncoated	C-3	Backlack	C-5	C-6
isovac 350-65 A HS	✔	✔	☰	✔	✔

✔ Available ☰ On request

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