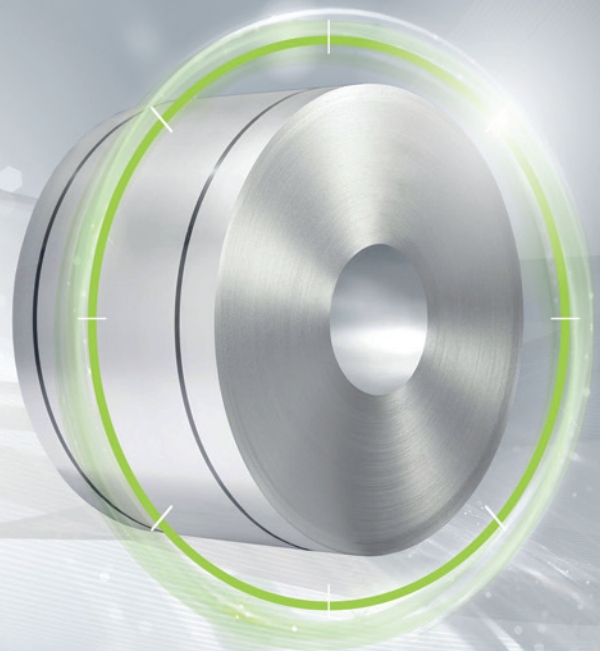


FULLY
PROCESSED

isovac high-perm 290-65 A

The specialist with the highest permeability

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.

The optimum adjustment of texture increases magnetizability and reduces core losses of isovac HP 290-65 A. This increase in efficiency makes it possible to maintain the same level of performance while reducing component size and saving material, weight and costs. This also means that a higher level of performance can be achieved with the same component size.

Upon request, isovac HP 290-65 A can be supplied with an electrical steel insulation system and can be used directly in as-delivered condition.

Convincing advantages:

- » Increased performance achieved by increasing torque based on higher magnetizability (improvement by up to 0.05 T at J25, J50, J100)
- » Possible cost optimization through less material usage, less weight and less space requirement resulting from downsizing while maintaining the same level of performance
- » 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 290-65 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.

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 290-65 A	440	435	560	20	210

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 HP 290-65 A	1.05	0.62	2.55	1.50	1.58	1.67	1.78	1100

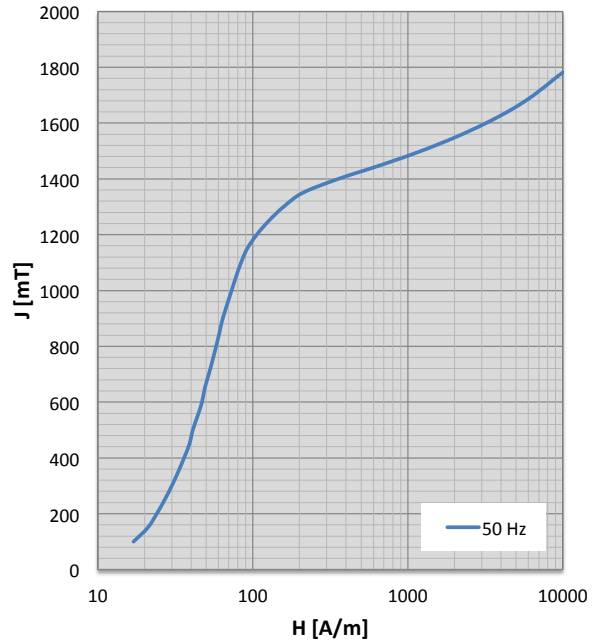
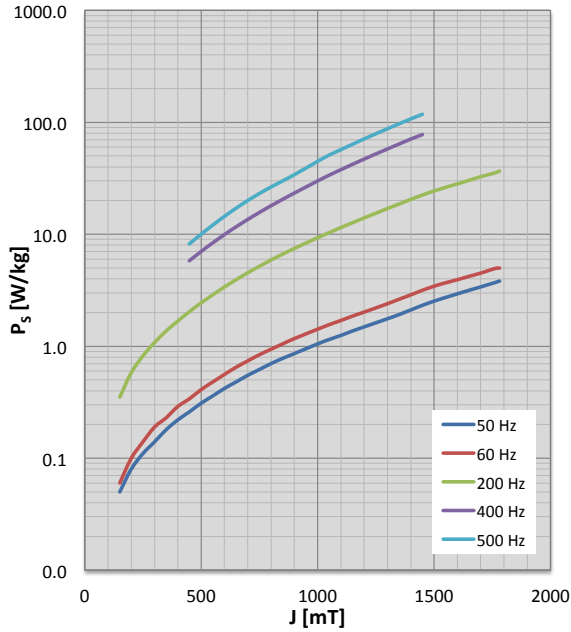
Physical properties:

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 HP 290-65 A	7.60	64.5	22

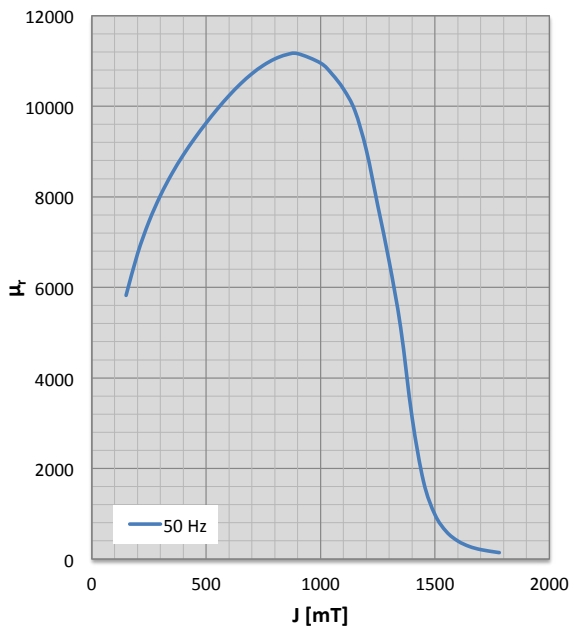
Characteristics P_s/J loss curve and characteristics J/H magnetization curve

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	17	0.02	4575	100	19	0.02	4268	100	24	0.13	3267
150	21	0.05	5820	150	22	0.06	5337	150	30	0.35	3928
200	24	0.08	6740	200	26	0.10	6105	200	36	0.58	4370
250	27	0.11	7453	250	30	0.14	6689	250	42	0.82	4687
300	30	0.14	8028	300	33	0.19	7152	300	48	1.08	4926
350	33	0.18	8509	350	37	0.23	7536	350	54	1.37	5114
400	36	0.22	8924	400	40	0.29	7866	400	60	1.68	5265
450	39	0.26	9293	450	44	0.34	8158	450	66	2.04	5391
500	41	0.31	9631	500	47	0.41	8426	500	72	2.44	5497
550	44	0.36	9946	550	50	0.48	8675	550	78	2.88	5589
600	47	0.42	10235	600	54	0.56	8904	600	84	3.38	5664
650	49	0.48	10495	650	57	0.65	9111	650	90	3.93	5723
700	52	0.55	10719	700	60	0.74	9290	700	97	4.53	5764
750	55	0.62	10904	750	63	0.84	9439	750	103	5.18	5787
800	58	0.70	11046	800	67	0.94	9554	800	110	5.89	5790
850	61	0.78	11138	850	70	1.05	9631	850	117	6.65	5775
900	64	0.86	11162	900	74	1.17	9659	900	125	7.47	5742
1000	73	1.05	10954	1000	84	1.42	9526	1000	142	9.32	5620
1050	78	1.15	10711	1050	89	1.56	9362	1050	151	10.35	5539
1100	84	1.25	10381	1100	96	1.70	9160	1100	160	11.48	5467
1150	92	1.37	9902	1150	103	1.86	8871	1150	169	12.69	5403
1200	106	1.49	9031	1200	116	2.02	8227	1200	181	14.01	5272
1250	127	1.62	7805	1250	138	2.20	7200	1250	197	15.43	5039
1300	158	1.76	6565	1300	169	2.40	6109	1300	216	16.98	4794
1350	210	1.92	5110	1350	223	2.63	4810	1350	250	18.66	4290
1400	357	2.11	3124	1400	373	2.88	2988	1400	385	20.49	2890
1450	675	2.32	1709	1450	698	3.16	1654	1450	710	22.43	1625
1500	1220	2.53	979	1500	1248	3.44	957	1500	1266	24.38	943
1550	2042	2.73	604	1550	2070	3.69	596	1550	2090	26.26	590
1600	3199	2.94	398	1600	3226	3.93	395	1600	3253	28.20	391
1650	4718	3.16	278	1650	4749	4.21	277	1650	4793	30.36	274
1700	6497	3.39	208	1700	6537	4.50	207	1700	6609	32.69	205
1762	9000	3.71	156	1761	9000	4.95	156	1758	9000	35.40	155
1781	10000	3.82	142	1780	10000	4.99	142	1777	10000	36.68	141

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 [-]
400	80	4.64	3970	400	91	6.58	3509
450	89	5.79	4044	450	101	8.21	3556
500	97	7.02	4092	500	111	10.01	3571
550	107	8.39	4108	550	123	12.09	3545
600	116	9.94	4099	600	137	14.46	3494
650	127	11.66	4070	650	151	17.10	3434
700	138	13.56	4024	700	165	20.00	3375
750	150	15.67	3967	750	180	23.12	3324
800	163	17.98	3901	800	194	26.44	3286
850	177	20.52	3828	850	208	30.00	3256
900	191	23.33	3745	900	224	34.05	3203
1000	224	29.95	3550	1000	270	44.79	2943
1050	242	33.74	3450	1050	297	51.03	2815
1100	260	37.77	3360	1100	317	57.01	2758
1150	280	42.17	3269	1150	341	63.70	2685
1200	301	46.99	3177	1200	366	71.12	2606
1250	322	52.22	3088	1250	392	79.08	2537
1300	345	57.83	3002	1300	420	87.67	2463
1350	365	64.04	2940	1350	439	97.11	2450
1400	454	70.83	2451	1400	510	107.29	2184
1450	725	77.75	1591	1450	762	117.99	1515
1500	1252	85.33	953	1500	1273	129.63	938

Available Dimensions

Grade named according to isovac®	Delivery form	Width [mm]	Length [mm]
isovac HP 290-65 A	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 HP 290-65 A	✔	✔	☰	✔	-

✔ Available ☰ On request

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