

isovac 47D165

The specialist with the lowest losses and highest permeability

Production in modern continuous annealing lines ensures that this semi-processed isovac® grade exhibits homogeneous mechanical and magnetic properties. High dimensional accuracy and defined degrees of roughness guarantee best punchability and further processing. isovac 47D165 is characterized by a special annealing process used to set optimum texture. This achieves higher magnetizability and lower losses. isovac 47D165 is also highly decarbonized in as-delivered condition, which means that the final annealing time at the customer can be significantly shortened. Subsequent annealing at the customer for the purpose of adjusting optimum magnetic properties completely eliminates any mechanical damage introduced to the material during the punching process.

Convincing advantages:

- » Increase in performance and efficiency as a result of high permeability and polarization (improved by up to 0.03 T at J25, J50, J100)
- » Alternative potential cost savings through smaller component sizes for machinery and thus lower material usage while maintaining the same performance.
- » Shorter final annealing made possible by the low carbon content and thus reduced overall costs resulting from lower energy input
- » Best processability through consistent mechanical properties and homogeneous, clean surfaces with defined roughness
- » Excellent stackability resulting from high dimensional accuracy (thickness tolerance)

voestalpine supplies isovac 47D165, 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®	0.2 %-Yield strength $R_{p0.2}$ [MPa]	Tensile strength R_m [MPa]	Elongation A_{80} [%]	Hardness HV5 [-]
isovac 47D165	420	470	22	185

Magnetic properties:

after final annealing according to EN 10341 (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 47D165	1.10	0.63	2.75	1.57	1.60	1.68	1.80	1600

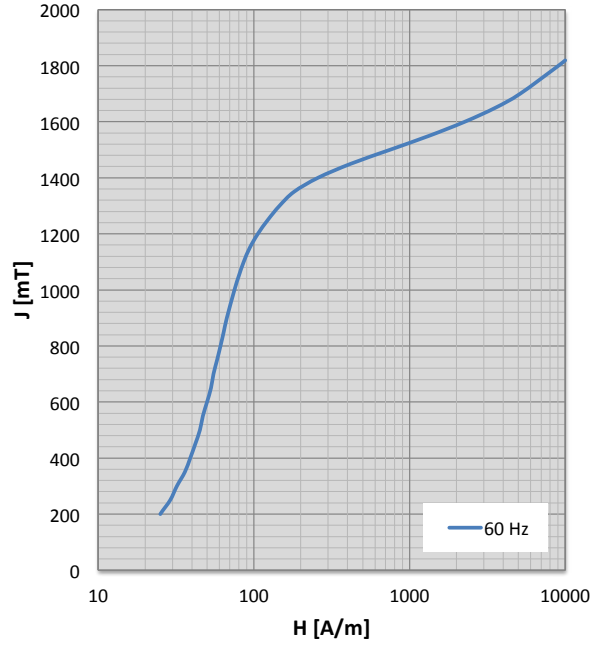
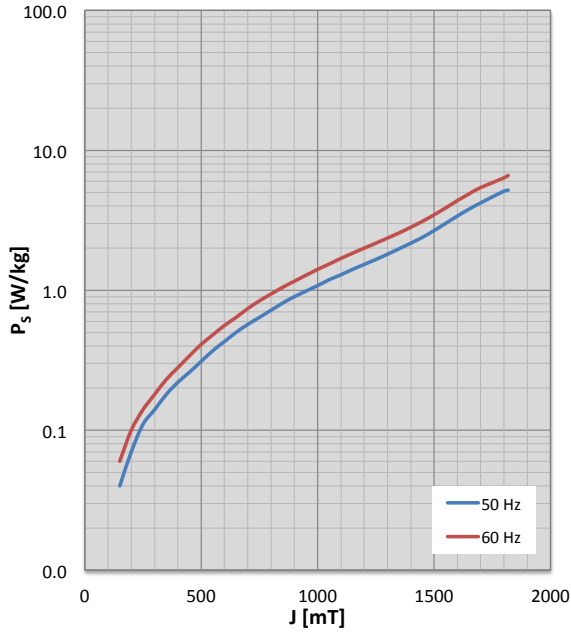
Physical properties:

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 47D165	7.75	38.5	30

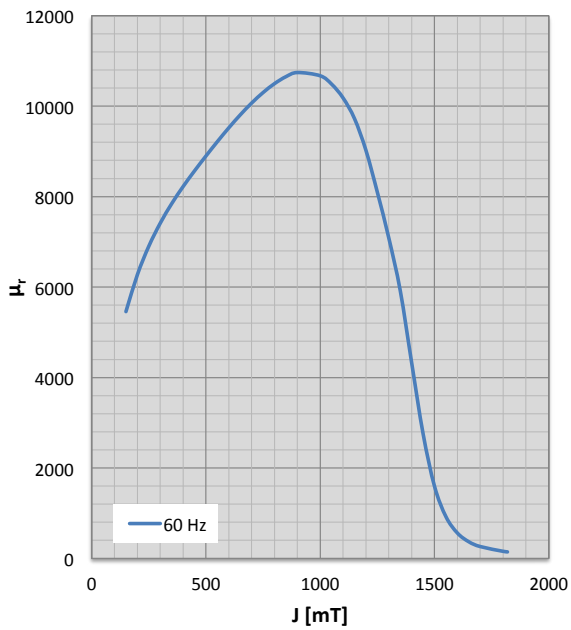
Characteristics P_s/J loss curve and characteristics J/H magnetization curve

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			
J [mT]	H [A/m]	P _s [W/kg]	μ _r [-]	J [mT]	H [A/m]	P _s [W/kg]	μ _r [-]
150	21	0.04	5567	150	22	0.06	5456
200	25	0.07	6438	200	25	0.10	6273
250	28	0.11	7116	250	29	0.14	6903
300	31	0.14	7668	300	32	0.18	7412
350	34	0.18	8138	350	36	0.23	7843
400	37	0.22	8552	400	39	0.28	8222
450	40	0.26	8932	450	42	0.34	8569
500	43	0.31	9292	500	45	0.41	8898
550	45	0.37	9641	550	47	0.48	9216
600	48	0.43	9973	600	50	0.56	9521
650	50	0.50	10282	650	53	0.64	9807
700	53	0.57	10560	700	55	0.74	10069
750	55	0.64	10799	750	58	0.84	10301
800	58	0.72	10991	800	61	0.94	10498
850	61	0.81	11129	850	64	1.05	10652
900	64	0.90	11188	900	67	1.16	10743
1000	72	1.08	11004	1000	75	1.41	10671
1050	78	1.19	10743	1050	80	1.54	10485
1100	84	1.29	10365	1100	86	1.69	10180
1150	93	1.41	9846	1150	94	1.84	9722
1200	105	1.53	9096	1200	106	2.00	9021
1250	122	1.66	8132	1250	123	2.17	8093
1300	146	1.81	7103	1300	146	2.36	7083
1350	181	1.98	5933	1350	181	2.57	5921
1400	257	2.17	4332	1400	258	2.82	4323
1450	418	2.39	2759	1450	419	3.11	2754
1500	749	2.67	1594	1500	749	3.46	1593
1550	1339	3.01	921	1550	1338	3.88	922
1600	2265	3.39	562	1600	2264	4.37	562
1650	3564	3.80	368	1650	3563	4.88	369
1700	5133	4.21	264	1700	5135	5.42	263
1798	9000	5.09	159	1799	9000	6.33	159
1818	10000	5.19	145	1819	10000	6.61	145

Available Dimensions

Grade named according to isovac®	Delivery form	Width [mm]	Length [mm]
isovac 47D165	Wide strip / Slit strip	19 – 1470	-
	Cut-to-length sheets	300 – 1470	300 – 5000

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