

## isovac 47D175

### 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 47D175 is characterized by a special annealing process used to set optimum texture. This achieves higher magnetizability and lower losses. isovac 47D175 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 47D175, 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 47D175	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 $\mu_r$
	50 Hz [W/kg]	60 Hz [W/lb]	50 Hz [W/kg]	60 Hz [W/lb]	[T]	[T]	[T]	[-]
isovac 47D175	1.15	0.66	2.90	1.65	1.60	1.68	1.80	1600

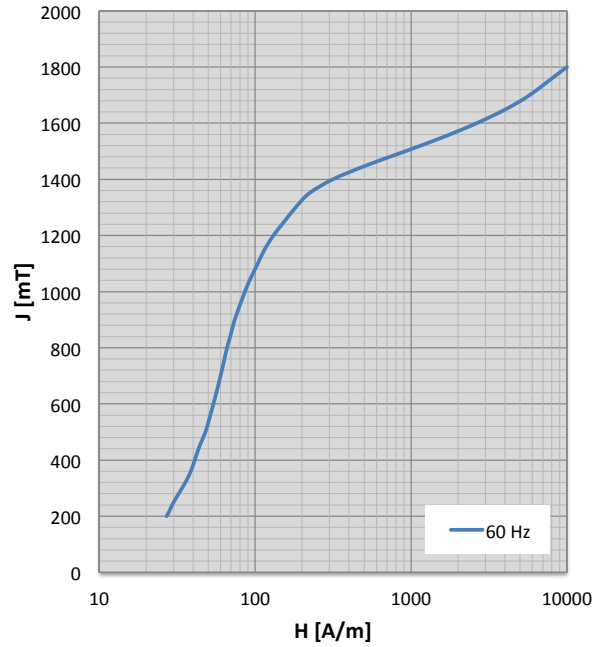
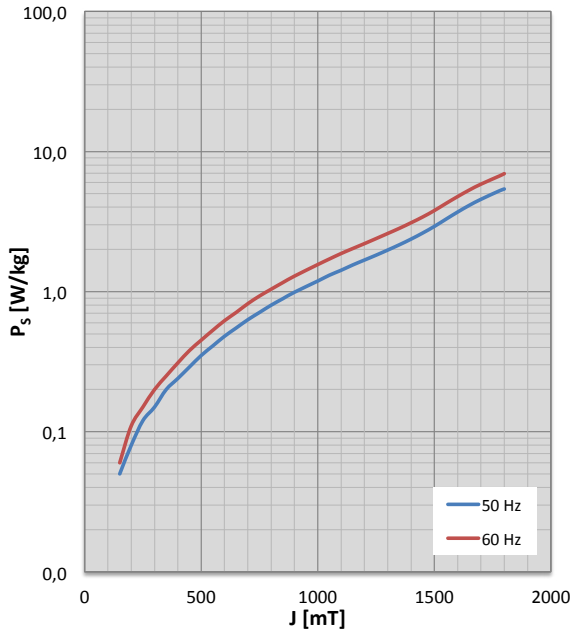
**Physical properties:**

Typical values

Grade named according to isovac®	Density $\rho$ [g/cm <sup>3</sup> ]	Specific electrical resistance $\rho_s$ [ $\mu\Omega\text{cm}$ ]	Thermal conductivity $\lambda$ [W/mK]
isovac 47D175	7.75	38.5	30

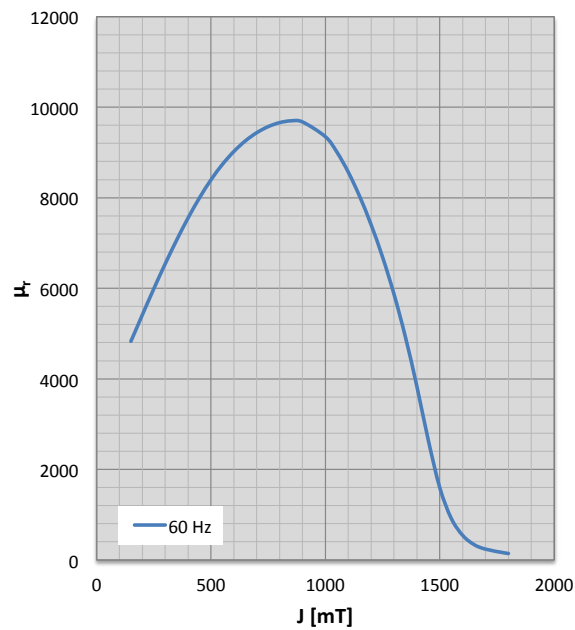
**Characteristics  $P_s/J$  loss curve and characteristics  $J/H$  magnetization curve**

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



**Characteristics  $\mu_r/J$  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			
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> [-]
150	22	0.05	4943	150	23	0.06	4825
200	26	0.08	5583	200	27	0.11	5413
250	29	0.12	6208	250	30	0.15	5988
300	33	0.15	6810	300	34	0.20	6541
350	36	0.20	7381	350	38	0.25	7065
400	39	0.24	7914	400	41	0.31	7554
450	42	0.29	8401	450	44	0.38	8000
500	45	0.35	8834	500	48	0.45	8396
550	48	0.41	9207	550	51	0.53	8737
600	51	0.48	9518	600	54	0.62	9022
650	54	0.55	9765	650	57	0.71	9255
700	57	0.63	9948	700	60	0.82	9437
750	60	0.71	10066	750	63	0.93	9571
800	63	0.80	10117	800	66	1.04	9659
850	67	0.89	10098	850	70	1.16	9699
900	72	0.99	10002	900	74	1.29	9674
1000	84	1.19	9532	1000	86	1.56	9348
1050	93	1.31	9142	1050	94	1.71	9011
1100	103	1.42	8656	1100	104	1.87	8566
1150	115	1.55	8087	1150	115	2.03	8027
1200	131	1.68	7442	1200	131	2.20	7401
1250	153	1.82	6717	1250	154	2.39	6687
1300	181	1.98	5889	1300	182	2.60	5867
1350	222	2.16	4933	1350	222	2.83	4918
1400	315	2.37	3836	1400	315	3.10	3829
1450	518	2.62	2641	1450	519	3.41	2638
1500	917	2.92	1595	1500	918	3.79	1594
1550	1603	3.29	919	1550	1600	4.26	919
1600	2643	3.70	543	1600	2635	4.77	543
1650	4064	4.13	339	1650	4057	5.31	339
1700	5761	4.56	239	1700	5758	5.85	239
1780	9000	5.25	158	1781	9000	6.70	158
1800	10000	5.40	143	1800	10000	6.95	143

## Available Dimensions

Grade named according to isovac®	Delivery form	Width [mm]	Length [mm]
isovac 47D175	Wide strip / Slit strip	19 - 1470	-
	Cut-to-length sheets	300 - 1470	300 - 5000

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