

isovac NO35-22 Y460

The specialist for high-strength e-mobility applications

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. isovac NO35-22 Y460 was optimized for use as a rotor material in the automotive industry. Highest strengths are achieved through special heat treatment and make it possible to design special rotor geometries and reduce the air gap between rotors and stators. The small thickness of 0.35 mm achieves additional specific total losses at high frequencies, which also makes isovac NO35-22 Y460 a suitable material for stators. When used as a stator material, subsequent annealing of the stator lamellas can lead to additional improvement in specific total losses.

Convincing advantages:

- » As a result of highest strength larger freedom of design for high speed electric machinery
- » 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 NO35-22 Y460, 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		EN 10303	IEC 60404-8-4	JIS C2552	GOST 21427.2	ASTM A677	AISI	IS648
	Material No.	Abbreviation							
isovac NO35-22 Y460	-	-	NO35-22	-	-	-	-	-	-

Mechanical properties:

Tensile test according to DIN EN ISO 6892-1 and hardness according to DIN EN ISO 6507-1 (Typical values);
Test direction: Longitudinal

Grade named according to isovac®	Yield strength	0.2 %-Yield strength	Tensile strength	Elongation	Hardness
	R _{eH} [MPa]	R _{p0.2} [MPa]	R _m [MPa]	A ₈₀ [%]	HV5 [-]
isovac NO35-22 Y460	500	470	600	25	205

Magnetic properties:

in as-delivered condition (Typical values). Magnetic measurement pursuant to DIN IEC 60404-2.
Test direction: Mean value from longitudinal and transverse measurements at 50 Hz (400 Hz)

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
	400 Hz [W/kg]	400 Hz [W/lb]	400 Hz [W/kg]	400 Hz [W/lb]	50 Hz [T]	50 Hz [T]	50 Hz [T]	50 Hz [-]
isovac NO35-22 Y460	21.4	9.7	51	23.2	1.51	1.60	1.72	520

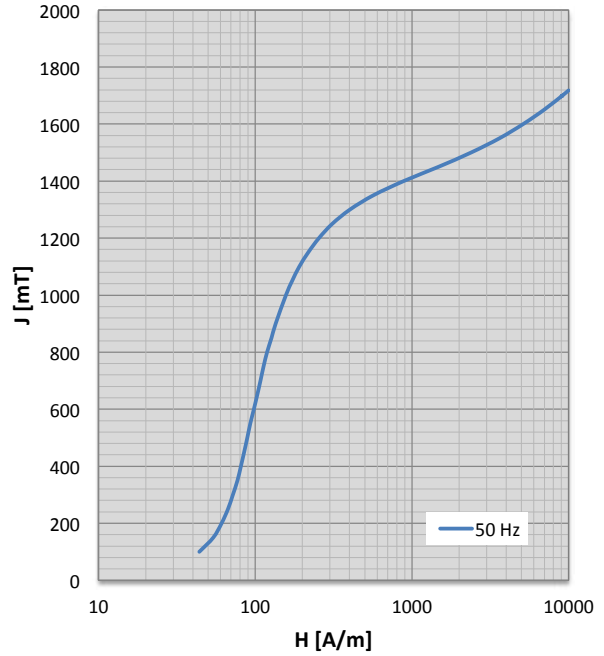
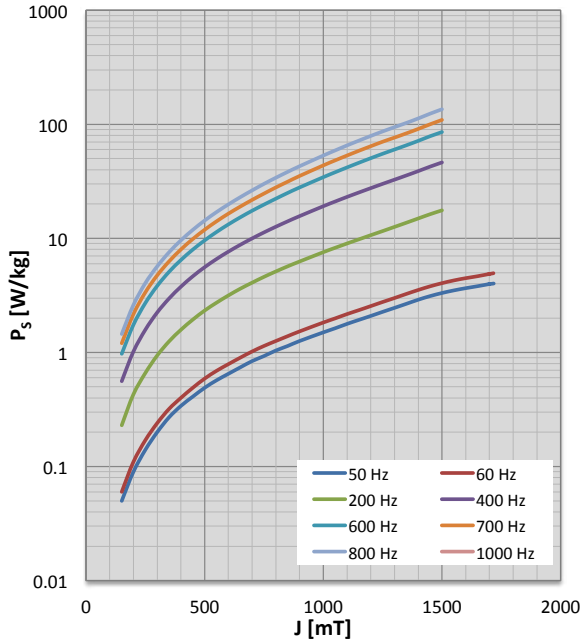
Physical properties:

Typical values

Grade named according to isovac®	Density ρ [g/cm³]	Specific electrical resistance ρ _s [μΩcm]	Thermal conductivity λ [W/mK]
isovac NO35-22 Y460	7.60	64.5	22

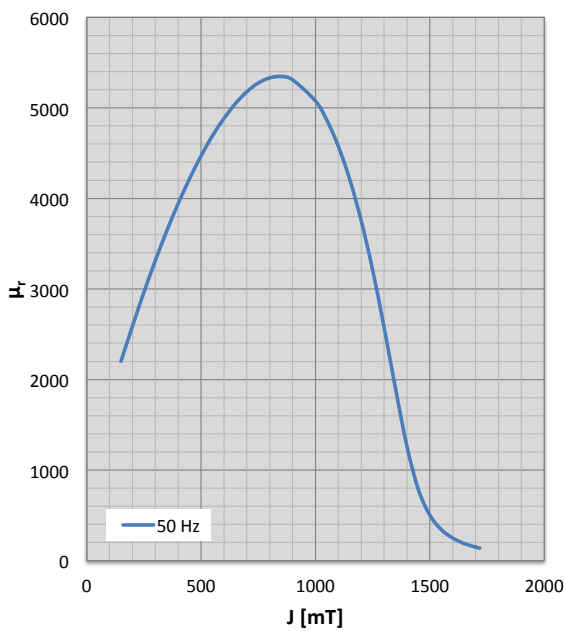
Characteristics P_s/J loss curve and characteristics J/H magnetization curve

Test direction: Mean value from longitudinal and transverse measurements at indicated frequencies, Epstein test



Characteristics μ_r/J permeability curve

Test direction: Mean value from longitudinal and transverse measurements at 50 Hz, Epstein test



Frequency dependence of magnetic properties

Test direction: Mean value longitudinal and transverse at indicated frequencies and polarizations, Epstein 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	44	0.02	1816	100	44	0.02	1827	100	44	0.10	1815
150	54	0.05	2202	150	54	0.06	2215	150	55	0.23	2182
200	61	0.09	2589	200	61	0.11	2604	200	62	0.43	2559
250	67	0.14	2962	250	67	0.17	2978	250	68	0.66	2918
300	72	0.20	3313	300	72	0.24	3332	300	73	0.94	3255
350	77	0.27	3641	350	76	0.32	3660	350	78	1.25	3570
400	81	0.34	3944	400	80	0.40	3963	400	82	1.58	3860
450	85	0.41	4218	450	85	0.49	4238	450	87	1.94	4120
500	89	0.49	4470	500	89	0.59	4484	500	91	2.33	4364
550	93	0.57	4693	550	93	0.69	4700	550	96	2.73	4581
600	98	0.65	4883	600	98	0.79	4890	600	100	3.16	4773
650	103	0.74	5047	650	102	0.90	5049	650	105	3.62	4936
700	108	0.84	5178	700	108	1.02	5175	700	110	4.09	5070
750	113	0.93	5275	750	113	1.14	5265	750	115	4.60	5177
800	119	1.04	5331	800	120	1.26	5318	800	121	5.13	5250
850	127	1.14	5347	850	127	1.39	5324	850	128	5.69	5287
900	135	1.26	5310	900	136	1.53	5286	900	136	6.27	5283
1000	157	1.50	5076	1000	158	1.83	5039	1000	156	7.57	5116
1050	172	1.63	4863	1050	173	1.99	4824	1050	170	8.27	4915
1100	191	1.78	4574	1100	193	2.17	4531	1100	189	9.02	4636
1150	218	1.93	4207	1150	220	2.35	4162	1150	214	9.81	4274
1200	255	2.09	3752	1200	258	2.55	3707	1200	250	10.67	3817
1250	310	2.27	3206	1250	315	2.77	3163	1250	304	11.59	3270
1300	402	2.46	2574	1300	408	3.00	2535	1300	394	12.61	2626
1350	567	2.67	1896	1350	577	3.26	1863	1350	553	13.72	1943
1400	886	2.90	1258	1400	903	3.53	1235	1400	861	14.95	1294
1450	1478	3.12	781	1450	1496	3.80	772	1450	1433	16.29	806
1500	2383	3.32	502	1500	2414	4.05	495	1500	2317	17.61	516
1550	3618	3.50	342	1550	3644	4.28	340	1550	3509	19.04	352
1600	5132	3.66	249	1600	5166	4.48	247				
1650	6971	3.81	189	1650	6984	4.66	189				
1700	9130	3.98	149	1700	9153	4.88	149				
1697	9000	3.97	151	1697	9000	4.86	151				
1718	10000	4.02	138	1717	10000	4.95	138				

Available Dimensions

Grade named according to isovac®	Delivery form	Width [mm]	Length [mm]
isovac NO35-22 Y460	Wide strip / Slit strip	19 – 1320	-
	Cut-to-length sheets	300 – 1320	300 – 5000

Deliverable coating systems

Grade named according to isovac®	Uncoated	C-3	Backlack	C-5	C-6
isovac NO35-22 Y460	✔	✔	☰	✔	✔

✔ Available ☰ On request

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