



DENKA ER

DENKA ER is an elastomer copolymerized from ethylene, vinyl acetate and acrylic esters. For an elastomer it has excellent heat resistance and oil resistance. ER, like other acrylic elastomers offers excellent resistance to severe environments in thermoset applications. ER is classified as a high-temperature, oil-resistant, specialty-type rubber. The American Society for Testing Materials (ASTM) approved designation for ER is ACM (acrylic monomer). ASTM and the Society of Automotive Engineers (SAE) have a classification system (D2000/J200) designed for rubbers used primarily in automotive applications. ER fits within the DF (150°C capable), DH (150°C capable), and EH (175°C capable) oil-resistant elastomer tables of this system. ER is generally formulated with reinforcing, curing, and other modifying agents. These thermoset compositions are processed into parts designed for applications requiring -40°C to 200°C performance.

DENKA ER has an extremely excellent resistance to cyclic deterioration by heat/ozone or heat/oil aging. DENKA ER gives excellent cost-performance for rubber parts used for brand-new automobiles.

The following table shows approximate weathering resistance, heat resistance, lubricant oil resistance, complex aging resistance and low temperature resistance of the typical 9 kinds of elastomers.

Performance comparison of elastomers

Rubber	Weather Resistance	Heat Resistance	Lubricant Oil resistance		Cyclic aging resistance Oil & Heat	Low Temperature Resistance
			JIS No.1 Test Oil	Engine Oil		
DENKA ER	V	V	V	V	V	G
ACM	V	V	V	V	P	G
AEM	V	V	V	V	P	G
High Nitril NBR	P	F	V	F	-	G
ECO	V	G	V	P	-	V
Q	V	E	V	F	-	E
FKM	V	E	V	V	-	F
CSM	G	G	V	F	-	G
CR	F	F	V	F	-	G

E; Excellent > V; Very good > G ;Good > F; Fair > P; Poor -;out of comparison

ADVANCED POLYMER TRADING FZC

19th Floor, Festival Tower

Dubai Festival City , Dubai - UAE

Phone: +971 4 293 2608 Fax: +971 4 293 2525

Website : www.advanced-polymer.com

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Properties of DENKA ER

DENKA ER has five grades. The viscosity of each grade is adjusted to the range of 36 - 52 on account of its processability. Three grades have the epoxy based cure site, where cure speed isn't so fast, and two grades have the carboxyl based cure site with better cure speed. The raw material is in the form of a bale and the color is light yellow.

Raw Property of DENKA ER

Type	Cure Site	Mooney Viscosity ML(1+4)@100°C	Volatile Matter
ER-5300	Epoxy	44-52	1%≥
ER-8401	Epoxy	36-41	1%≥
ANX-3	Epoxy	41-49	1%≥
ER A403	Carboxyl	41-49	1%≥
ER A804	Carboxyl	36-44	1%≥

Heat & Oil Resistance of DENKA ER

DENKA ER is designed to cover severe durability. In other words, various grades that can meet the various requirements of the severe durability are lined up.

Following table shows the enduring temperature and oil resistance of each grade. DENKA ER A403 and A804, which have fast curing speed also, have better heat resistance compared to other grades. Another Heat & Oil Resistance map shows the DENKA ER grades in comparison with some other elastomers.

Approximately Enduring Temperature Range and Oil-Resistance

	Enduring Temperature							Oil Resistance Volume Change, %	
Grade	-40℃	-30℃	-20℃	125℃	150℃	175℃	200℃	IRM 903 150℃,70h	ATF 150℃,70h
ER-5300			←				→	20 – 30	5 – 15
ER-8401	←	←	←				→	60 – 70	15 – 25
ANX-3	←	←	←				→	30 – 40	5 – 15
ER A403			←				→	20 – 30	0 – 10
ER A804	←	←	←				→	45 – 55	10 – 20

IRM 903: New Lubricant Test Oil equivalent to ASTM No. 3 Oil
ATF: Automatic Transmission Fluid

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