

## MORESCO

# KYOTO FUSIONEERING Radiation-Resistant Lubricant



RADIATION RESISTANT GRASS KF-RG-RG42R240-1 Lot 2505000 1/6 FLANMARE LIQUID QUBITUATI NO OFEN FLANS Kyoto Fusioneering's Radiation-Resistant Lubricants are designed for optimal performance in fusion machines. They withstand harsh conditions such as neutron and gamma irradiation, high vacuum environments, and high temperatures, ensuring stable lubrication over extended periods. They can be applied to various sliding parts, such as bearings in high vacuum pumps and turbines, as well as valves and remote handling systems in fusion machines.

## **Specifications**

	<b>Oil</b> (Sales unit: 500 ml)	KF-RO-RP42X130XX	KF-RO-RP42R240XX	KF-RO-RP42S042XX
L	Radiation-resistance Upper limit [MGy]*1	30	15	15
	Vapor pressure [Pa]	3×10-7	1×10 <sup>-10</sup>	2×10 <sup>-6</sup>
	Viscosity [mm <sup>2</sup> /s 40°C]	125	240	42
	Pour point [°C]	2.5	-15.0	-22.5
	Compatibility NBR	Compatible Incompatible	Incompatible Compatible	Incompatible Incompatible
	<b>Grease</b> (Sales unit: 1 kg)	KF-RG-RG42X130-0,1,2	KF-RG-RG42R240-0,1,2	KF-RG-RG42S042-0,1,2
	<b>Grease</b> (Sales unit: 1 kg) Radiation-resistance Upper limit [MGy]* <sup>1</sup>	<b>KF-RG-RG42X130-0,1,2</b> 30	<b>KF-RG-RG42R240-0,1,2</b> 15	<b>KF-RG-RG42S042-0,1,2</b> 15
	Grease (Sales unit: 1 kg) Radiation-resistance Upper limit [MGy]* <sup>1</sup> Vapor pressure [Pa]	<b>KF-RG-RG42X130-0,1,2</b> 30 3×10 <sup>-7</sup>	<b>KF-RG-RG42R240-0,1,2</b> 15 1×10 <sup>-10</sup>	<b>KF-RG-RG42S042-0,1,2</b> 15 2×10 <sup>-6</sup>
	Grease (Sales unit: 1 kg) Radiation-resistance Upper limit [MGy]*1 Vapor pressure [Pa] Consistency number of NLGI	<b>KF-RG-RG42X130-0,1,2</b> 30 3×10 <sup>-7</sup> 0,1,2	<b>KF-RG-RG42R240-0,1,2</b> 15 1×10 <sup>-10</sup> 0,1,2	KF-RG-RG42S042-0,1,2 15 2×10 <sup>-6</sup> 0,1,2
	Grease (Sales unit: 1 kg) Radiation-resistance Upper limit [MGy]*1 Vapor pressure [Pa] Consistency number of NLGI Base oil	KF-RG-RG42X130-0,1,2 30 3×10 <sup>-7</sup> 0,1,2 KF-RO-RP42X130XX	KF-RG-RG42R240-0,1,2 15 1×10 <sup>-10</sup> 0,1,2 KF-RO-RP42R240XX	KF-RG-RG42S042-0,1,2   15   2×10 <sup>-6</sup> 0,1,2   KF-RO-RP42S042XXX

<sup>\*1</sup> In the case of pure  $\gamma$ -irradiation. Only the base oil was evaluated, with the grease properties assumed to be the same as the base oil. The upper limit may vary depending on the type of irradiation (neutron,  $\gamma$ -ray,  $\beta$ -ray, mixed, etc.).

## The Effect of γ-irradiation on the Oil Viscosity



KF-RO-RP42X130XX KF-RO-RP42R240XX

Mineral oil

\*<sup>2</sup> The relative viscosity and consistency are respectively calculated by taking their values of their unirradiated state as 1

### The Effect of Mixed Radiation Field on the Grease Consistency (=grease hardness) (70% neutron and remaining γ-ray)



### **References**\*<sup>3</sup>

- M.Ferrari "Neutron and gamma irradiation test campaigns on greases and oils" Radiation resistant lubricants Meeting, CERN, 2019.10
- M.Ferrari et al. "Characterization of a polyphenyl ether oil irradiated at high doses in a TRIGA Mark II nuclear reactor" Nuclear Instruments and Methods in Physics Research Section B: Beam Interactions with Materials and Atoms Volume 497, 2021.6
- M.Ferrari et al. "Selection of radiation tolerant commercial greases for high-radiation areas at CERN: Methodology and applications" Nuclear Materials and Energy Volume 29, 2021.12



\*<sup>3</sup> The model numbers in references are the following KF model numbers. RP-42R is KF-RO-RP42R240XX. RG-42R-1 is KF-RG-RG42R240-1.

### **Inquiry Process**



Kyoto Fusioneering Ltd. email: biz@kyotofusioneering.com

#### Our Whitepaper

