

## Regarding stability of Asahi Flon-22

- Asahi Flon-22 is thermally stable, and does not decompose from heat under normal refrigerator operating conditions.
- However, thermal decomposition takes place under high heat when contact is made with flames, and there is a danger of generating poisonous gases such as hydrogen halide (HCl, HF), phosgene (COCl<sub>2</sub>), and carbon monoxide.
- For this reason, when doing welding repair on refrigerators, it is necessary to fully replace the Asahi Flon-22 inside the refrigerator with air and nitrogen.
- The thermal decomposition of Asahi Flon-22 tends to be more as the temperature used increases.

- Also, the thermal decomposition temperature and amount of thermal decomposition changes depending on the type of coexisting metals and lubricants, moisture, and air.
  - For example, Asahi Flon-22 is stable under 400°C, but decomposition begins at between 400-500°C.
  - Furthermore, when in contact with certain types of metals (tin, pewter, zinc and the like), an extreme decomposition reaction occurs at 200-300°C.
  - The stable temperature at which Asahi Flon-22 can coexist with steel, lubricating oil for long periods of time with no decomposition is 150°C.
- However, it is necessary to test and consider the actual use in coexistence with metals, lubricating oils and the like.

### • Asahi Flon-22 thermal decomposition in quartz tubes (1atm)

- Temperature at which acid is produced: 290°C
- Temperature at which free halogen is seen: 480°C

### • Asahi Flon-22 thermal stability

- Long-term stable temperature: 150°C (maximum temperature at which can be used in coexistence with steel, lubricating oil)

### Effect on coexisting substances

Coexisting substance	Temperature x test length	Test results (R-22 decomposition ratio)
Fe	200°C x 2 years	0.29%
Cu	Same as above	0.16%
Fe + naphthenic oil	200°C x 300 days	1.05%
Cu + naphthenic oil	Same as above	0.28%
SUS316 + naphthenic oil	Same as above	0.45%

### Asahi Flon-22 thermal decomposition product under high temperatures due to flame

	R-22 concentration Vol%	Decomposition product (vol%)			
		HCl	HF	COCl <sub>2</sub>	Cl <sub>2</sub>
Gas combustion *1	2.5	0.07	0.14	0.04	0.001
Same as above *2	2.5	0.2	0.3	0.07	0.001
Wood combustion	4.8	0.01	0.34	0.12	0.0003
Coexistence with iron at 550°C	4.4	1.39	2.61	0.52	0.001

Other CO create trace amounts.

\*1 Start test 5 min. later \*2 Start test 30 min. later