

Compressed air

The cylinders have been designed for use with unlubricated air, in which case no maintenance is required. If lubricated air is used, lubrication must be continuous because the additional lubrication removes the lubricant applied at the factory. With reference to ISO/DIN 8573-1, the compressed air to use is class 3-4-3, i.e.:

- oil residue: 1 mg/m³
- powder residue: filtering 40 µm, 10 mg/m³
- water residue: dew point -20°C, 0.88 mg/m³.

Gasket material

Some families of Metal Work cylinders are available with gaskets made of different materials.

Polyurethane: the best in terms of long-life, resistance to wear and reduced friction.

Chemically compatible with:

- Pure aliphatic hydrocarbons (butane, propane, gasoline). Any impurities (moisture, alcohol, acid or alkaline compounds) can chemically attack polyurethane.
- Mineral oil and grease (some additives can chemically attack the material)
- Silicone oil and grease
- Water up to +50°C
- Resistance to ozone and ageing

Not compatible with:

- Ketones, esters, ethers
- Alcohols, glycols
- Hot water, steam, alkali, amines, acids.
- Good elasticity down to -35°C (for low temperature PU version only).

NBR: These gaskets have a shorter life than polyurethane gaskets. However, they are recommended for use in environments causing the formation of water condensate, such as tropical climates, where polyurethane gaskets may tend to deteriorate quickly due to hydrolysis.

Chemically compatible with:

- Methane, butane, propane, oily acids
- Aliphatic hydrocarbons
- Lubrication oils
- Gasoline

Not compatible with:

- Ozone and exposure to sunlight.
- Good elasticity down to -35°C (for low temperature NBR version only).

FKM/FPM: Can withstand temperatures as high as 150°C. This makes them ideal for use on rodless cylinders, high-speed applications, involving high temperatures at the sliding lips.

Chemically compatible with:

- Mineral oil and grease, slight swelling with oil grade ASTM no. 1 and 3.
- Silicon oil and grease
- Animal and vegetable oil and fat
- Aliphatic hydrocarbons (gasoline, butane, propane, natural gas)
- Aromatic hydrocarbons (benzol, toluene)
- Chlorinated hydrocarbons (tetrachloroethylene)
- Fuels
- Ozone, atmospheric agents, ageing

Not compatible with:

- Polar solvents (acetone, methylethylketone, diethyl ether, dioxane)
- Glycol-based brake fluids
- Ammonia gas, amines, alkali
- Superheated water vapour
- Low molecular organic acids (formic and acetic acid)

No-stick-slip cylinders:

Standard cylinders are designed to ensure trouble-free operation under any conditions, particularly at high speed. Operation tends to be irregular and jerky at very low speeds in the presence of side loads. In this case, no-stick-slip cylinders are recommended as they allow smooth operation. These versions feature specific tribological properties and polyurethane gaskets.

Radial oscillation of the piston rod

These cylinders have been designed to apply forces in the direction of the axis and not to withstand side loads. If you intend to use the cylinder piston rod with side loads, the play between the piston rod and guide bushing must be taken into account. Indicatively, each 100-mm stroke corresponds to 1-mm radial oscillation measured at the end of the piston rod.

Cylinder operating life

The life of cylinders depends on numerous factors including axial and radial loads, speed, frequency of use, temperature, shocks, air loss (limits). Below are a few factors that must be taken purely as a reference. They are not binding or guaranteed due to the variability of different factors.

Without radial load:

- ISO 6431 cylinders and round cylinders with polyurethane gaskets: 15,000 km.
- ISO 6431 cylinders and round cylinders with NBR gaskets: 8,000 km.
- ISO 6432 cylinders, SSC cylinders and compact cylinders with polyurethane gaskets: 30 million cycles.
- ISO 6432 cylinders and SSC cylinders with NBR gaskets: 15 million cycles
- Rodless cylinders: 5,000 km

Stroke tolerances

The actual cylinder stroke has a tolerance with respect to the nominal stroke, in compliance with any applicable laws, within the following ranges:

• ISO 6431 cylinders	32-50	-0	+2	mm
	63-200	-0	+2.5	mm
• ISO 6432 6432	8-25	-1	+1	mm
	32-50	-0,5	+1.5	mm
• Round cylinders	12-50	-1	+1	mm
	63-100	-1	+1.5	mm
• SSC cylinders	12-100	-0,5	+1.5	mm
	16-40	-1	+2	mm

Strokes exceeding the maximum value specified in the catalogue

Metal Work can supply cylinders with strokes greater than those specified in the catalogue, considering the production technological limits. The Metal Work Sales Department can provide you with full details. However, it is up to the end user to use these special cylinders properly, by guiding the piston rod, avoiding peak loads, etc.

Magnetic sensors

The magnetic field generated by permanent magnets housed in the piston assembly changes in shape and intensity depending on the presence of magnetic metal masses in the vicinity of the cylinder. These masses may prevent the sensors from switching correctly, in which case non-magnetic materials should be used. In particular, the tie rods of short-stroke and compact cylinders should preferably be made of stainless steel.