

## **Section 3: General Characteristics of Lining Materials**



The following are general characteristics of common materials used for protective linings. These should be used as broad guidelines only. **Always refer to the chemical resistance table contained in Section 4 for recommendations for specific chemicals. Contact your Polycorp representative for more detail.**

**Polycorp recommends that customers use the Material Recommendation Request Form in Appendix III to gather the specifics of a particular application. This provides Polycorp Engineers with the ideal amount of information to make optimum lining recommendations.**

## SOFT NATURAL RUBBER (NR)

Good resistance to most inorganic chemicals with the exception of strong oxidizing agents. They exhibit outstanding abrasion resistance and will expand and contract with thermal variations of the metal substrate.

### ADVANTAGES

- Lowest cost of all elastomers
- Ease of application
- Ease of cure
- Ease of repair
- Excellent low temperature properties
- Good general chemical resistance within temperature limitation
- Superior to excellent abrasion and tear resistance

### CONSIDERATIONS

- Not oil resistant
- Not flame resistant

### TYPES

- Hardness range from 30 to 70 Shore A
- FDA compliant
- Chemical cure - for quick atmospheric cure and repairs

### USES

- Chemical storage tanks
- Tank trailers, railroad tank cars
- Tumblers, vibrators, cyclones, fans, pumps, pipe and fittings, etc

### DO NOT USE

- In tumblers or vibrators where oily parts may be processed
- For plating tanks

### STANDARD PRODUCTS:

1032, 1060, 1061, 1064, 1068, 1097, 1099, 2000, 2001, 2002, 2004, 2019, 2020, 2027, 2033, 2033P, 2041, 2042, 3049, 60714, 64025, T1000, T1001, T1003, T1004S, T1200, T1300, T8000

## HARD NATURAL RUBBER (SEMI AND EBONITE)

Better chemical and heat resistance than soft natural rubber. Wide application in organic and inorganic acids and chlorine gas. Specific grades have excellent permeation resistance and heat resistance.

### ADVANTAGES

- Moderate cost
- Ease of application and repair
- Ease of cure
- Excellent chemical and permeation resistance
- Heat resistance up to 200°F (93°C)

### CONSIDERATIONS

- Not oil resistant
- Not flame resistant
- Subject to damage by cold weather exposure or sudden extreme temperature changes

### TYPES

- Semi-hard
- General purpose Ebonite
- FDA compliant and electroplating tank Ebonite (no graphite)
- Chlorine and hot brine resistant Ebonite (graphite)

### USES

- Chemical process tanks, agitators, mixers, pumps, fans, water treatment columns
- Plating tanks (nickel, copper, cadmium)
- Pipe and fittings
- Pickling tanks

### DO NOT USE:

- For chrome plating tanks
- For nitric or hydrofluoric acid
- Where abrasion is severe
- Where oil is present

### STANDARD PRODUCTS:

1003, 1004, 1006, 1017, 1035, 1036, 1038, 1040, 1042, 1048, 1053, 2017, 3014

## TRIFLEX™

Three ply natural rubber lining (soft-hard-soft) that has excellent chemical and moderate abrasion resistance. The semi-hard rubber center layer provides a permeable barrier and the soft cushion allows maximum adhesion to steel.

### ADVANTAGES

- Moderate cost
- Ease of application
- Ease of cure
- Ease of repair
- Good flexibility reducing danger of cracking in cold or temperature changes
- Excellent chemical and permeation resistances

### CONSIDERATIONS

- Not oil resistant
- Not flame resistant

### USES

- Phosphoric acid process equipment and hydrochloric acid storage
- Acid pickling tanks where brick sheathing is used

### DO NOT USE

- Where oil or solvents are present
- For tumblers or vibrators

### STANDARD PRODUCTS:

1000, 1001, 1008, 1019HT, 1020HT, 1066, 1077HT, 3015, 3016

## CHLOROBUTYL /BROMOBUTYL (CIIR/BIIR)

Good resistance to acids and caustic solutions up to 260°F (127°C). Recommended for applications that require ozone, sunlight and aging resistance. Excellent low temperature properties.

### ADVANTAGES

- Heat resistance up to 260°F (127°C)
- Good resistance to ozone, sunlight and aging
- Good chemical and permeation resistance

### CONSIDERATIONS

- Not oil resistant
- Not flame resistant

### USES

- For hydrofluoric acid, super phosphoric acid and sodium hypochlorite storage and process
- Mixed acid wastes
- For sodium hypochlorite storage and transportation

### DO NOT USE

- For plating tanks
- Where oil or solvents are present

### STANDARD PRODUCTS:

1024, 1051, 1054, 1055, 1056HT, 1058, 2006, 2007, 2040, 2055, 2056, 4631, 6511, 6512, 17001, T6005, T6105

## CHLOROPRENE (CR, Neoprene®)

A synthetic elastomer with some physical properties similar to natural rubber. Superior to natural rubber in resistance to heat, ozone, sunlight, weather, flame and oil.

### ADVANTAGES

- Oil resistant
- Heat resistant up to 200°F (93°C)
- Flame resistant - will not support combustion
- Good chemical resistance
- Excellent resistance to ozone, sunlight and weather
- Excellent abrasion resistance

### CONSIDERATIONS

- A preheated table required for application

### TYPES

- General purpose
- High abrasion resistance

### USES

- Caustic storage and transportation tanks
- Chemical process and storage tanks
- Mining equipment, such as tumbling barrels and vibrators
- Agitators, pumps, fans, pipe and fittings, other equipment

### DO NOT USE

- For plating tanks
- Where solvents are present (halogenated solvents, ketones and lacquer solvents)
- In kerosene or mineral spirits

### STANDARD PRODUCTS:

2010, 2011, 2012, 2013, 2034, 5621, 5821, T5009, T5109

## NITRILE (NBR)

Good resistance to greases, oils, petroleum hydrocarbons and other non-polar solvents. Good heat aging resistance up to 239°F (115°C).

### ADVANTAGES

- Good resistance to oil, fuel and hydraulic fluids
- Excellent resistance to water
- Good abrasion resistance and tensile strength
- Good low temperature properties
- Heat resistance

### CONSIDERATIONS

- A preheated table required for application
- Poor resistance to sunlight and ozone
- Poor weathering qualities
- Poor resistance to highly polar solvents: acetone, MEK

### TYPES

- General purpose

### USES

- Fuel and oil handling hoses, tanks

### DO NOT USE

- Highly polar solvents such as acetone, MEK, ether
- Exposure to sun, weather and ozone

### STANDARD PRODUCTS:

2048

## STYRENE-BUTADIENE RUBBER (SBR)

Good abrasion resistance, excellent impact strength, very good resilience and a high tensile strength. The operating temperature of SBR lining is up to 160°F (71°C).

### ADVANTAGES

- Excellent sliding abrasion resistance
- Excellent tear and wear resistance
- Good resistance to dilute acids, alkalis and alcohols

### CONSIDERATIONS

- Not resistant to oil, gasoline, hydrocarbon or oxidizing agents
- Not flame resistant
- Poor resistance to ozone, sunlight and weather

### TYPES

- General purpose

### USES

- Pulley lagging and sliding abrasion application
- Mining equipment

### DO NOT USE

- Where oil, gasoline and hydrocarbons are present

### STANDARD PRODUCTS:

9159, 9160, 9169, 55159, 55160

## MOR (MODERATE OIL RESISTANCE) RUBBER

Blended rubber lining for general purpose use for abrasion and moderate oil resistance.

### ADVANTAGES

- Excellent abrasion resistance
- Resistance to trace quantities of oil, fuel and hydraulic oil
- Operating temperature range from -40°F (-40°C) to 160°F (71°F)
- Ease of application and repair

### CONSIDERATIONS

- Not flame resistant
- Poor resistance to ozone, sunlight and weather

### TYPES

- General purpose

### USES

- Flotation process in mining industry
- General mining applications

### STANDARD PRODUCTS:

3049