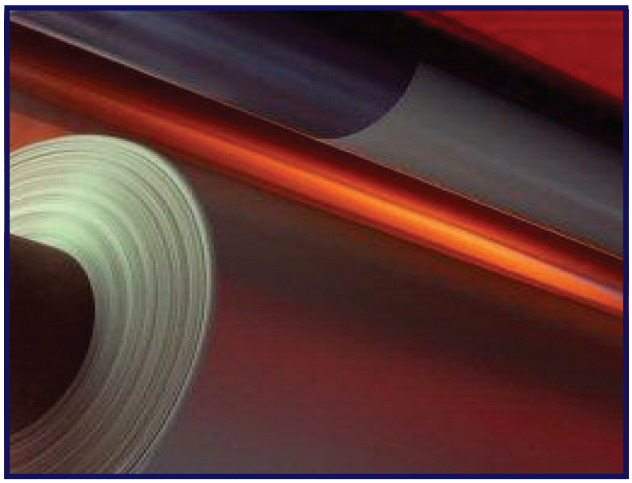
HEXPOL COMPOUNDING

GENERAL INDUSTRIAL ROLLER COVERINGS

Overview

The roller industry uses a very wide range of elastomers, which is largely due to the numerous physical property requirements, as well as the exposure to a wide variety of chemicals seen during specific applications. A unique characteristic of the roller industry is the variety of roller applications, and the demands those applications create, and nowhere is this more prevalent than general industrial roller applications.

"General Industrial" is a very broad classification of industries and applications that utilize rubber covered rollers in their processes. Industrial rollers are used in a variety of applications, such as food, paper, steel, textile, wood, and plastic industries, to accomplish various mechanical functions. Rollers can be used to protect, squeeze, feed, insulate or convey, and each compound used for the rubber covering must meet the specific requirements for the application parameters.



Typical industries that fall into this classification are coating rollers used to apply paint to various metal decorating applications; furniture industry where rollers are used in sanding and pressing operations also to apply glues, stains, varnishes; plastic industry where rollers are used to make plastic pellets, laminate, film coatings etc.; food industry where rollers are used in direct and indirect food packaging operations for rice, peanuts, meat; leather industry where rollers are used in stripping and treating operations; circuit board industry where rollers are used for conveying, cleaning and to apply chemical coatings; glass industry where rollers are used in forming processes, cleaning and application of chemical treatments/ tinting etc.

Rollers are used in all these industries and many others but the physical property requirements of each of these industries vary from application to application. The target objective in all of these applications is the same, elastomeric compositions must be capable of creating a uniform pressure zone called a "NIP". To insure that the nip region remains constant, the properties of the roll covering must be stable and not degrade with use.

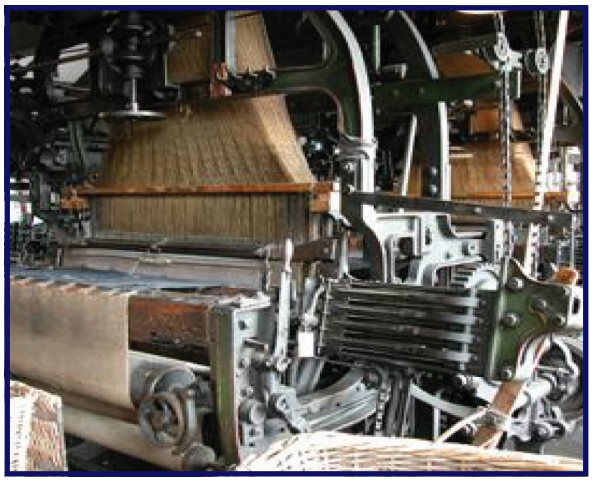
The selection of the roll covering must take into account the physical properties of the covering originally (i.e., static) as well as physical properties of the covering in use (i.e., dynamic). An effective covering must not change appreciably in use, as determined largely by the environment e.g. solvent and chemical exposure, as well as the dynamic properties of the roll covering. Chemical and solvent resistance are important aspect to consider in many applications. The difficulty in ascertaining the suitability of a compound in a specific roller environment has to do with the fact that the solutions typically are multi-component solutions that can be a blend of various
solvents and/or chemicals. This can drastically impact the selection process since chemistry varies so much. Most solutions have synergistic reactions taking place that makes the selection process much more complex. Also, the specific compound ingredients in the various roll coverings play a role in balancing the chemistry. This is why different roll covering materials of a given elastomer exhibit varied resistance to a given media.

Application Overview

Textile

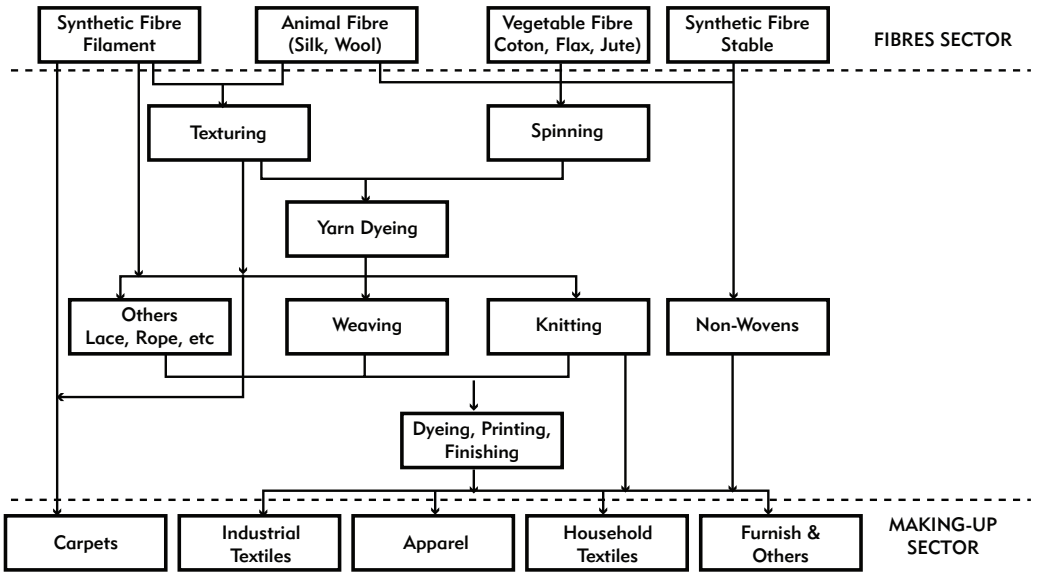
The textile industry utilizes rubber rollers in a variety of applications designed to squeeze water and or chemicals out of substrates that are being manufactured. These applications include bleaching, dyeing , mercerizing and slashing. Roll coverings used in these applications must withstand the chemistry being used to bleach and/or dye the fabric being processed. Normally a caustic media is used in the majority of the mills, and most wet applications operate in a temperature range from 80 to 100 C. Roll coverings must also exhibit excellent dynamic properties since rollers operate under high pressure and speeds. Lastly, roll coverings must be able to withstand elevated temperatures in the aqueous media and must not degrade from long term exposure. Common elastomers used are NBR, EPDM, CSM, XNBR, and HNBR.

Textiles have an assortment of uses, the most common of which are for clothing and containers such as bags and baskets. In the household, they are used in carpeting, upholstered furnishings, window shades, towels, covering for tables, beds, and other flat surfaces, and in art. In the workplace, they are used in industrial and scientific processes such as filtering. Miscellaneous uses include flags, backpacks, nets, tents, cleaning devices, such as handkerchiefs, transportations devices such as balloons, kites, sails, and parachutes.



Recommended Compounds for Textile Roll Positions:

BLEACHING	AF, BNB, HAL, HYB, 311, 354, 355, 362
MERCERIZING	AF, BNB, BT, 311, 362, 364
DYING/RINSING	AF, BNB, HAL, 311, 362, 365
SQUEEZE ROLLS	AF, 311, 362, 366
GUIDE/EXPANDER	AF, ATX
SEIDLE	XN, 38 SERIES



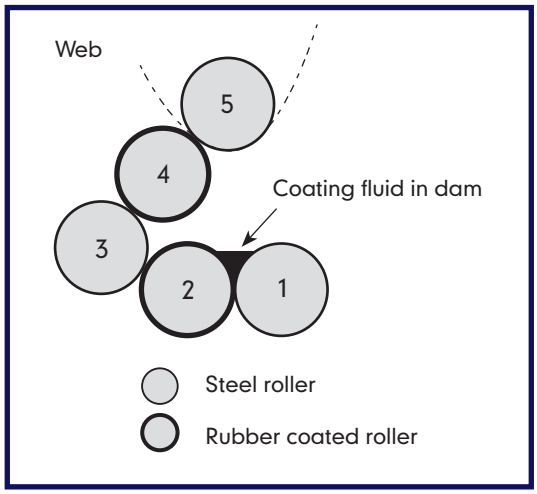
Product Offering

Specialty

With the different demands on these rollers, your normal roller manufacturing company will not attempt to make these rollers. The primary reason is the lack of expertise or knowledge of different applications. Basically industrial rollers are still rubber covered and are processed the same as smaller rollers. If the roller manufacturer will ask the right questions, it then gets down to a compound recommendation for the application. Other companies will stay away from this market due to the cost to stock a number of different rubber compounds since each application might require a different hardness or physical property to ensure the roller performs successfully. Another factor to consider is the actual size of the rollers involved, which is usually much larger than these customers are used to seeing.

OTHER CATEGORIES

Conductive, Anti-static, FDA Compliant, corona treater, silicone.



Compound Benefits

AF	45-95 Duro. Aquaflex. Black-Filled Nitrile. Good for use in aggressive hot aqueous media. Outstanding hardness stability, abrasion resistance, and resiliency.
ATX	40-90 Duro. Nitrile. General purpose. Not for high abrasion resistance.
BNB	40-95 Duro. Specially Formulated Nitrile compound offering resistance to hot aqueous media.
38	75-95 Duro. Anti-Static Carboxylated Nitrile. Nonblack compound used for high abrasion resistance & low heat build up. Anti-static to prevent fiber wrap up.
311 & 362	80 Shore D. 311 is Natural Rubber & 362 is Nitrile. For hard roller in squeezing operations. Resistant to textile additives, wetting & bleaching agents, alkalis & acids.
354/355	75-95 Duro. Hypalon. Resistant to bleaching, alkaline, acid, and desizing solutions. Resistant to swelling & softening in hot water. 354 is black, 355 is non-black.
364/365/366	55-95 Duro. Nitrile compounds. Resistant to dyeing, washing, and mercerizing solutions as well as acids & alkalis. The 364 is for mercersizing, the 365 is for acids, and the 366 is black loaded and used for squeeze applications where high load is needed.
HYB	60-95 Duro. Hypalon compounds formulated for resistance to hot aqueous media.
HY	30-95 Duro. Hypalon compounds offering outstanding abrasion and heat resistance.
NE	5-95 Duro. Neoprene compounds formulated for general industrial use.
XN	40-95 Duro. Unique Nitrile compounds offering outstanding abrasion resistance.

General Industrial

Industry	Application	Compound
PLASTICS	CORONA TREATER	HY, SI
PLASTICS	LAMINATING	60-70 Duro. HY, EP, ES, SI
PLASTICS	HOT SEALING FILM	Wide range duro. HY
PLASTICS	PLASTIC BAGS	Wide range duro. BN, NE , HY
PLASTICS	EMBOSSING FILM	60-70 Duro. HT, BNP
PLASTICS	COOLING HOT FILM	60-70 Duro. HT, HY
PLASTICS	PELLETIZING	60-85 Duro. HYP, XN
METALS	COATING	40-60 Duro. EP
METALS	SHAPING	Wide range duro. XN, HY
METALS	POLISHING	Wide range duro. XNP, BNP, HY
METALS	EMBOSSING	Wide range duro. XNP, BNP, HY, HN
METALS	BEVERAGE CONTAINERS	40-60 Duro. EP, BN, HY
CORRUGATED	CUTTING	60-80 Duro. XNP, BNP, HT
CORRUGATED	GLUEING	40-60 Duro. BN, EP, NE
CORRUGATED	COATING	Wide range duro. EP, BN, HY
CORRUGATED	FOLDING	80-95 Duro. XNP, BNP, HT
CORRUGATED	FEEDING / PULLING	30-40 Duro. BN, HT, NE
DE-WATERING	SQUEEZE / NIP	70-90 Duro. AF, BNP
DE-WATERING	TENSION	70-90 Duro. AF, BNP
GLASS	FORMING	40-60 Duro. NE, SI
GLASS	CONVEYING	40-60 Duro. AF
GLASS	CLEANING	40-60 Duro. AF
FOOD	SHELLING PEANUTS	
FOOD	RICE ROLLERS	
FOOD	FOOD LINES	FDA Compliant. BN, NE, EP
FOOD	COATING	FDA Compliant. BN, NE, EP
WOOD / FURNITURE	PRESSED WOOD PRODUCTS	50-70 Duro. AF, NE, XN
WOOD / FURNITURE	SANDING	50-70 Duro. AF, NE, XN
WOOD / FURNITURE	STAINING	30-60 Duro. EP, NE
MISCELLANEOUS	ABRASIVE DRIVE	60-80 Duro. AF, XNP, HN
MISCELLANEOUS	CONVEYING	60-90 Duro. AF, MU, NR/SBR, XN
MISCELLANEOUS	FARMING	60-90 Duro. NR/SBR

Technical Rolls - Specialities

Technical Rolls	Description
HNBR	Waxed paper application rollers Tumbler drums in textile mills (towelling) Metal coating foil (photographic film packets).
EPDM/Silicone	Blown film - First nip rollers.
Foam	Wood staining and varnishing Leather buffing belt drive rollers Tile staining Newsprint spool-butting rollers.
Corona Rollers	Silicone for standard film Chase Corona-Hypalon for thick film.
High Friction Compounds	Pumice compounds (can be abrasive) Cork dust filled compounds.
(Nylon Substitute) Ebonite	Hard Nylon substitute.
Coating Rollers Metal coating/lacquering	292 grade for optimum solvent resistance EC grade EPDM for good solvent resistance & resilience EG grades for solvent resistance, recovery & grindability.
Compounds with good release	Teflon filled NBR, Hypalon or EPDM Compounds containing glass beads for good release, especially against soiled surface (paper).
Bonding Silicone	Bonding silicone for applications where superior bond strength is required.
Polyurethane Substitutes	MU grade, Millable Polyurethane XN grades, Carboxylated Nitriles.
Food Grade	NBR, CR grades using FDA approved ingredients

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