

THE
NOVAFLEX[®]
GROUP



Engineered Hose Systems



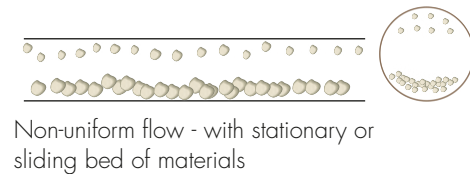
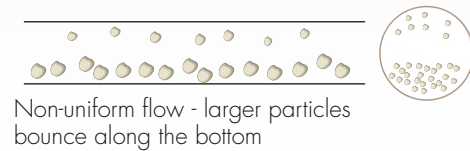
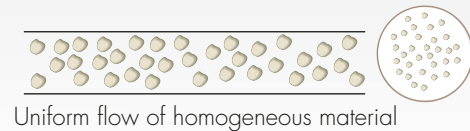
Hose Wear

For the transfer of material during a manufacturing process, flexible hoses are extensively used in preference to rigid, heavy and hard to install steel or plastic piping. Flexible hoses are used in the transfer of media such as; slurry (*liquid mixed with materials*) or dry material in a pneumatic application (*material blown with air*). To avoid sediment settling in a hose, it is necessary to keep the mixture flowing or turbulent. Deposits on the bottom of the conveying hose reduce efficiency and may cause clogging. Depending on the proportion of liquid to solids as well as the flow rate, material may be carried along in one of the following ways:

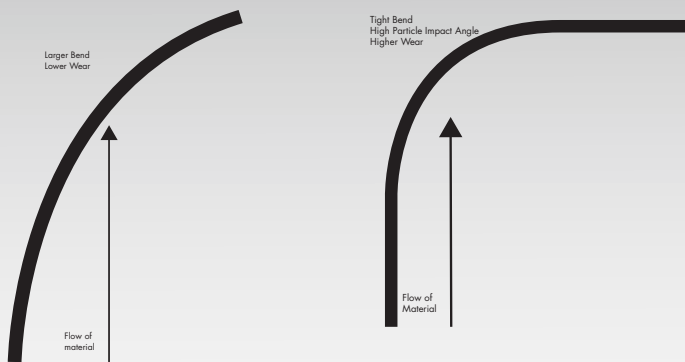
Causes of Wear

Abrasion is wear or undesirable removal of material from the surface of the hose tube. The degree of wear and or abrasion varies widely and is determined by some of the following factors:

- Material transferred (e.g. *size, sharpness, size distribution, hardness*)
- Velocity - flow rate
- Turbulence
- Angle of material impact - affected by bend radius
- Slurry or dry
- Contamination elements - presence of oil or chemicals (PH value of slurry liquid)
- Temperature



Hose Tube with Different Bends Depicting Particle Impact



To increase the service life of hose used in a bend; it is recommended that the hose be rotated around its axis so that the wear is more evenly distributed.

There is a cost benefit relationship in the selection of a hose tube for a specific application. Several compounds that can service an application are available. To provide added life, the hose may require a thicker tube. All aspects should be considered; cost of hose, cost of product, hose service life and cost to install and uninstall (plant down time).

In many applications the media is constant, but in some, the media being transferred changes radically. It is always best to evaluate the product in a consistent environment. One of the more valid approaches is measuring tonnage processed. (Exclusive of differences in media conveyed.)

On new or unmonitored applications, it may be necessary to evaluate several compound types to obtain the most cost efficient product for the application. NovaFlex® will develop the best hose for the application.

Choice of Wear Resistant Material

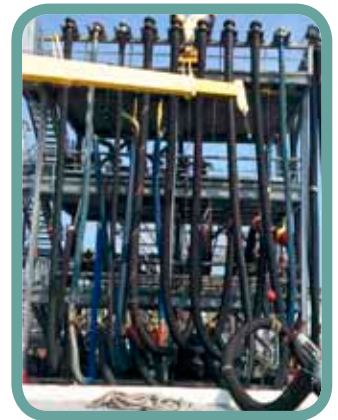
The choice of the tube compound (wear material) in a hose is dependent on the elements of the application.

Compared to the hardest steels, for wear protection rubber compounds are typically soft and elastic and thus display greater wear resistance.

A rubber compound's unique quality to absorb the kinetic energy of particle impact by elastically deforming, rather than chipping the wear surface found on hard surfaces, results in higher wear resistance. Wear resistant rubber typically has a hardness range of 35 to 65 Shore A Durometer.

It is challenging for a single compound to satisfy each abrasion application. Compounds are uniquely formulated to resist abrasion, cutting, ripping and other elements of wear. NovaFlex® utilizes the tube compounds most suited to the abrasion resistance requirements of the application being engineered. Typically, flexible material transfer hoses are designed for applications that require the adaptability to overcome bends, offsets, misalignments, expansion or contraction and vibration. Applications with bends are particularly demanding. It is important to note that the larger the bend radius engineered into a wear application, the greater the service life of the hose.

Hose wear is always on the outside radius of the hose bend. The greater the bend, the lower the angle of impact; therefore the lower the wear. To reduce wear, the optimum bend radius is ten times the inside diameter of the hose.



Elements of a Custom Hose

Hose Construction Options

Typically, custom hoses are plied constructions composed of the basic four hose elements: *tube, carcass, cover and hose ends*.

Most hose styles are built in standard plied construction using multiple layers of tire cord reinforcement. To maintain hose shape during bends and in vacuum, this may (or may not) include one or more steel helix wires.

A gimbal style is available in specific applications that require very high degrees of flexibility.

The specific tube recommended for an abrasion resistant hose depends on the material, its size, velocity of transfer, product mix and temperature.

Recommendations are only best estimates. The most cost effective hose is usually derived through measured testing.



Custom Hose Types

Plied Hose

Built with a smooth or corrugated cover. The plies of reinforcement are uniform throughout the hose. The use of various reinforcement types and combinations will affect the rated working parameters of the hose. A continuous wire helix runs the length of the hose. Some hoses may have two helix wires.



Gimbal Hose

Built with a smooth or corrugated cover. The plies of reinforcement are uniform throughout the hose. Special helix rings are built into the carcass. This provides extra flexibility as flex points are engineered between each helix ring.



Tube Wear Resistant Choices

NovaFlex® Compound Name	Rubber Type	Color	Din Abrasion Rating		Static Conductive	Operating Temperatures	Conductive Properties
			Dry (mm³)	Wet (mm³)			
NovaWear-TG	NR	Tan	208	65	not conductive	-40° to 160°F (-40° to 71°C)	>1000 gigaohms/ft
NovaWear-WG	NR	White	140	24	not conductive	-40° to 160°F (-40° to 71°C)	>1000 gigaohms/ft
NovaWear-BG	NR	Black	243	68	not conductive	-40° to 160°F (-40° to 71°C)	>1000 gigaohms/ft
NovaWear-RG	NR	Red	135	28	not conductive	-40° to 160°F (-40° to 71°C)	>1000 gigaohms/ft
NovaWear-YG	NR	Yellow	120	12	not conductive	-40° to 160°F (-40° to 71°C)	>1000 gigaohms/ft
NovaWear-BS	NR	Black	158	91	conductive	-40° to 160°F (-40° to 71°C)	< 1M ohms
NovaSyn	SBR	Black	320	141	conductive	-20° to 180°F (-28° to 82°C)	< 1M ohms
NovaWear-Petro	XNBR	Black	not applicable	not applicable	conductive	-30° to 300°F (-34° to 148°C)	not rated
Novapetro	NBR	Black	not applicable	not applicable	conductive	-30° to 180°F (-34° to 82°C)	not rated
Novachem	FKM	Black	not applicable	not applicable	not conductive	-30° to 300°F (-34° to 148°C)	not rated
Novalectra	SBR	Yellow	not applicable	not applicable	not conductive	-30° to 225°F (-34° to 107°C)	>1000 gigaohms/ft
Novalectra 2	EPDM	Green	not applicable	not applicable	not conductive	-30° to 250°F (-34° to 121°C)	>1000 gigaohms/ft

The DIN Abrasion Index referenced, is a lab test that confirms to ASTM D5963 and ISO 4649. This lab test attempts to measure the ability of a compound to resist abrasion only. It does not simulate cutting, gouging or tearing. It is a useful guide, but may not be representative of actual compound performance in an application.

It is impossible to test NovaFlex® products under all of the conditions to which they might be subjected in the field. It is therefore the buyer and/or end users' responsibility to test all products under conditions that duplicate service conditions prior to installation. Due to continuous improvements, technical data is subject to change without notice.

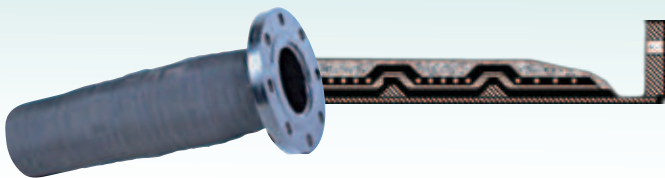
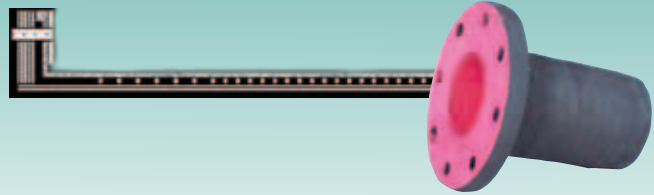
NovaFlex® Compound Name	Recommended Service
NovaWear-TG	very good abrasion, excellent cut and gouge resistance. very good dry /very good wet non-oily material transfer, large to small sharp material transfer
NovaWear-WG	very good abrasion resistance, good cut resistance for transfer of abrasive non-oily food grade products, small and medium size material transfer
NovaWear-BG	very good abrasion, very good cut & gouge resistance - excellent dry / excellent wet non-oily material transfer- large to small, sharp material transfer
NovaWear-RG	excellent abrasion, excellent cut & gouge resistance - excellent dry / excellent wet non-oily material transfer - large to small, sharp material transfer
NovaWear-YG	superior abrasion, cut & gouge resistance - superior dry / superior wet non-oily material transfer - large to small, sharp material transfer
NovaWear-BS	excellent static conductivity, excellent abrasion, cut & gouge resistance - excellent dry non-oily material transfer - small and medium size material transfer
NovaSyn	very good abrasion resistance, very good cut & gouge resistance - very good wet & dry non-oily material transfer for medium to small size material transfer
NovaWear-Petro	excellent abrasion resistance - for the transfer of oily materials - small and medium size material transfer
Novapetro	very good abrasion resistance - for the transfer of oily materials - small and medium size material transfer
Novachem	non rated for abrasive material transfer, excellent chemical & petroleum resistance
Novalectra	good abrasion resistance for small material transfer
Novalectra 2	non rated for abrasive material transfer, good chemical resistance

Hose End Connections

Duck & Rubber Flange

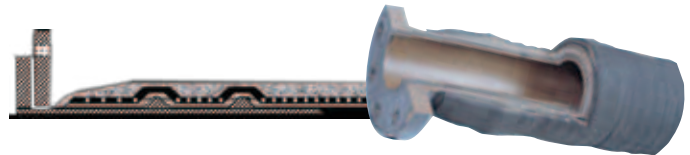
The tube and all fabric reinforcement is turned up the face of the flange end. A split steel back up flange is fitted to the back of the fabric flange face. Hose and flange are integral.

This design is used for light weight flanged connections and where there is abrasion or the media conveyed can damage standard steel ends.



Steel Nipple

Built-in-Steel nipples with either fixed or floating flanges. The strongest end connection design that can be used in higher pressure hoses. This design has the hose tube butted up against the hose nipple end, and continued over the built in nipple. This type of end is used where the media conveyed is not damaging to the steel connections.



Steel Nipple (Rubber Lined)

This is a superior design to duck and rubber flanges. The rubber tube is built under the hose nipple and turned up the face of the flange. This is a stronger end connection. This design is used where there is abrasion or the media conveyed can damage the metal used on end connections. The steel back-up flange rotates to easily mate with the bolt holes on the joining flange and eliminates potential damage from hose torque.



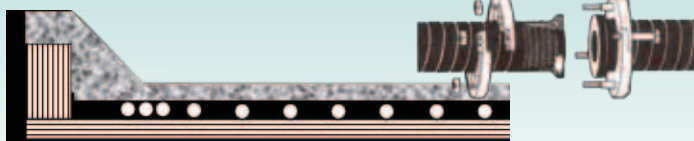
Capped End

The tube is turned up and vulcanized into the hose cover. The reinforcement of the hose is completely encapsulated in rubber. This design protects the interior and exterior of the hose from the media being conveyed.

Beaded End

A special angled build up at the hose end designed to provide a rubber to rubber seal.

This type hose end uses metal split back-up rings (150# drilling) to fit the angle of the built up area and are used to pull beaded end tight to its connection forming a good seal.



Slip Ring End

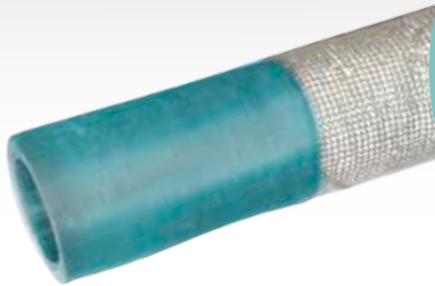
This special end permits the attachment of large ID discharge hose (8" to 24" ID) without the use of couplings. This special NovaFlex® end permits full flow and uses the internal hose pressure to form the liquid seal.

Furnace Cooling Hoses

NovaFlex® manufactures heat resistant hoses for all applications commonly found in metal smelt facilities. Highly flexible hose for furnace door, roof, cable cooling, castor coolant and water supply.

Hose Types Options

Standard	Hard wall or Soft wall
Gimbal	Smooth or corrugated
	Bumper—spiral or annular
	Fiberglass Shielded
	Non-conductive
	Conductive



NovaGlass Furnace Roof Cooling Hose

Designed as a more robust hose that has excellent flexibility. The elastomeric design will resist the effects of vibration, heat, flex fatigue and water hammer. This hose is made with multiple layers of fiber glass protection to provide maximum resistance to radiant and direct heat up to 1000°F. This hose is non-conductive with a resistance greater than 1000 gigaohms at 1000 volts DC. Hose can be made in a hard wall design with and without a steel helix in sizes 4" to 10".

NovaGlass 9155 Furnace Door Hose

Designed to be a highly flexible hose with an external temperature resistance to 1000 °F. This hose is non-conductive with a resistance greater than 1000 gigaohms at 1000 volts DC.



Part No.	I.D.	O.D.	WP psi	WT LBS/FT
9155GS-00500-00	½	1.05	400	0.34
9155GS-00750-00	¾	1.38	400	0.53
9155GS-01000-00	1	1.67	300	0.72
9155GS-01250-00	1¼	1.93	300	0.85
9155GS-01500-00	1½	2.18	250	0.99
9155GS-02000-00	2	2.80	250	1.58
9155GS-02250-00	2¼	3.05	250	1.75
9155GS-02375-00	2⅝	3.22	250	1.97
9155GS-02500-00	2½	3.35	250	2.06
9155GS-02750-00	2¾	3.60	250	2.25
9155GS-03000-00	3	3.85	250	2.43
9155GS-03250-00	3¼	4.10	250	2.61
9155GS-03500-00	3½	4.35	250	2.78
9155GS-04000-00	4	4.87	250	3.41
9155GS-04500-00	4½	5.37	250	3.78

NovaFlex® 9156 Nomex Furnace Door Hose

Designed to be a highly flexible hose with an external temperature resistance to 600° F. This hose is non-conductive with a resistance greater than 1000 gigaohms at 1000 volts DC.

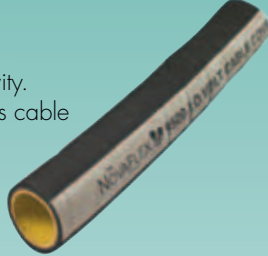


Part No.	I.D.	O.D.	WP psi	WT LBS/FT
9165GS-00500-00	½	1.05	400	0.33
9165GS-00750-00	¾	1.44	400	0.58
9165GS-01000-00	1	1.68	300	0.70
9165GS-01250-00	1¼	1.94	300	0.85
9165GS-01500-00	1½	2.18	250	0.98
9165GS-02000-00	2	2.82	250	1.56
9165GS-02250-00	2¼	3.08	250	1.73
9165GS-02375-00	2⅝	3.24	250	1.96
9165GS-02500-00	2½	3.37	250	2.04
9165GS-03000-00	3	3.85	250	2.41
9165GS-03500-00	3½	4.37	250	2.76
9165GS-04000-00	4	4.89	250	3.37
9165GS-04500-00	4½	5.39	250	3.74

Cable Cooling Hoses

NovaFlex® 9500

Soft wall hose with a low level of conductivity. This hose works well in applications such as cable covers and scuff barriers for cable. Hose has an electrical resistivity of 50 gigaohms per foot at 1000 volts DC.



Part No.	I.D.	O.D.	WP psi	WT LBS/FT
9500YS-00750-00	¾	1.21	200	0.44
9500YS-04100-00	1	1.46	200	0.58
9500YS-01125-00	1⅝	1.58	200	0.64
9500YS-01250-00	1¼	1.71	200	0.70
9500YS-01375-00	1⅝	1.84	200	0.76
9500YS-01500-00	1½	1.96	200	0.82
9500YS-01625-00	1⅝	2.13	200	0.98
9500YS-01688-00	1⅞	2.20	200	1.02
9500YS-01750-00	1¾	2.26	200	1.05
9500YS-01813-00	1⅞	2.32	200	1.09
9500YS-01875-00	1⅞	2.38	200	1.12
9500YS-02000-00	2	2.51	200	1.18
9500YS-02125-00	2⅝	2.63	200	1.25
9500YS-02250-00	2¼	2.76	200	1.31
9500YS-02375-00	2⅝	2.88	200	1.37
9500YS-02500-00	2½	3.01	200	1.44

NovaFlex® 9540

Superior designed non-conductive soft wall hose. Works well in applications such as cable covers and scuff barriers for cable. Hose has an electrical resistivity greater than 1000 gigaohms per foot at 1000 volts DC.



Part No.	I.D.	O.D.	WP psi	WT LBS/FT
9540YS-00500-00	½	1.00	200	0.38
9540YS-00750-00	¾	1.25	200	0.51
9540YS-01000-00	1	1.54	200	0.71
9540YS-01125-00	1⅝	1.72	200	0.86
9540YS-01250-00	1¼	1.84	200	0.93
9540YS-01375-00	1⅝	1.97	200	1.01
9540YS-01500-00	1½	2.09	200	1.08
9540YS-01563-00	1⅞	2.16	200	1.13
9540YS-01625-00	1⅝	2.22	200	1.16
9540YS-01750-00	1¾	2.36	200	1.33
9540YS-01813-00	1⅞	2.41	200	1.37
9540YS-01875-00	1⅞	2.48	200	1.41
9540YS-02000-00	2	2.71	200	1.71
9540YS-02250-00	2¼	2.99	200	2.11
9540YS-02375-00	2⅝	3.11	200	2.21
9540YS-02500-00	2½	3.23	200	2.31
9540YS-03000-00	3	3.73	200	2.71
9540YS-03500-00	3½	4.23	200	3.11
9540YS-04000-00	4	4.73	200	3.52



Cable Cooling Hoses

NovaSil Cable Cooling Hose

Designed for cooling electrical cables.

Has a superior external high performance thermal blanket layer. This hose's special exterior heat resistant design and proprietary compounds provide excellent service life. The hose design and working pressure is based on the application and is available with helical and annular bumpers (see below) to prevent damage due to cable dancing.

This hose is non-conductive with a resistance greater than 1000 gigohms at 1000 volts DC. The hardwall design uses a non-steel helix.



NovaGlass Hose

Designed for cable cooling hose. This robust hose is built to operate near furnaces that develop external temperatures of up to 1000°F. This hose is made with multiple layers of fiberglass and proprietary compounds for excellent service life.

The hose design and working pressure, if based on the application, is available with helical & annular bumpers (see below) to prevent damage due to cable dancing.

This hose is non-conductive with a resistance greater than 1000 gigohms at 1000 volts DC.

The hardwall design uses a non-steel helix.



Elements of Cable Cooling Hose

Available Designs

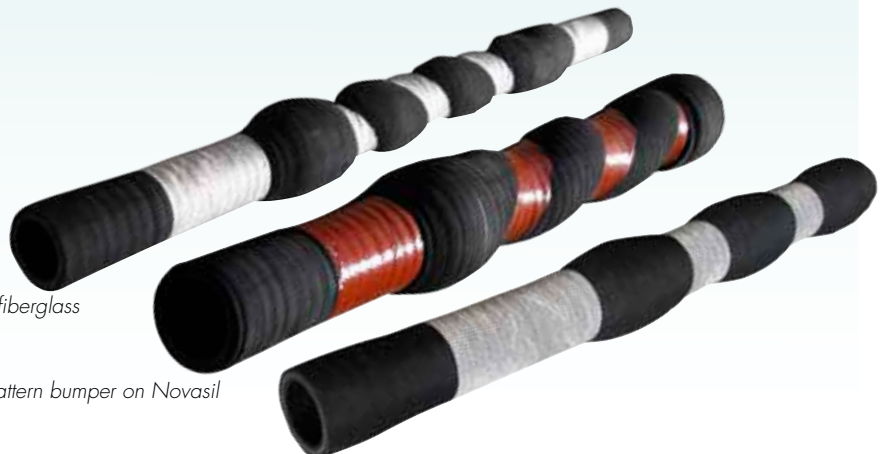
- Working Pressures up to 600 psi
- Hose Diameters 4" to 12"
- Lengths to 100 ft
- Electrical resistivity: Greater than 1000 gigohms at 1000 volts DC

Hose Bumpers

Hose bumpers are used to prevent damage to the hose carcass due to excessive wear or damage caused by hose or cable dancing, vibration, movement or abuse during installation.

(Bumpers may be added on to any style of hose.)

Bumpers are typically applied in an annular or spiral pattern.



Spiral pattern bumper on fiberglass

Spiral pattern bumper on Novasil

Annular pattern bumper on fiberglass

Engineered Mining/Slurry Hose

NovaTransfer

NovaTransfer is flexible rubber hose used in place of rigid piping and where a flexible connection is more advantageous. This hose can be used in both full suction and discharge applications.

NovaTransfer is custom engineered from design specific rubber compounds and various tube thicknesses.

NovaTransfer is manufactured to customer specific requirements and designed to maximize safe hose life.

NovaTransfer may be built with a variety of end connections to best meet the application's requirements.

End Connection Types: Full face rubber flange, beaded end (rotating flange), built in steel nipples (fixed or floating flanges), victaulic nipples, crimped on nipples

Tube Thicknesses: ¼", ⅜", ½", ⅝", ¾", 1", 1¼"

Tube Compound Types: NovaWear TG, NovaWear WG, NovaWear BG, NovaWear RG, NovaWear YG, NovaWear BS, NovaSyn



NovaTransfer 75psi

Tube	ID inches	ID mm	OD inches	OD mm	Working Pressure	Weight	
						lb/ft	Kg/m
¼"	2	50.80	2.88	73.2	75 psi	1.80	45.7
¼"	2⅝	60.33	3.26	82.8	75 psi	2.05	52.1
¼"	2½	63.50	3.38	85.9	75 psi	2.15	54.6
¼"	2⅞	73.03	3.86	98.1	75 psi	2.80	71.2
¼"	3	76.20	3.99	101.3	75 psi	2.91	73.9
¼"	3½	88.90	4.49	114.0	75 psi	3.35	80.1
¼"	4	101.60	4.99	126.7	75 psi	3.75	95.3
¼"	4½	114.30	5.5	139.7	75 psi	4.35	110.5
¼"	5	127.00	6.12	155.5	75 psi	5.18	131.6
¼"	6	152.40	7.21	183.1	75 psi	7.00	177.8
¼"	6⅞	168.28	7.84	199.1	75 psi	7.88	200.2
¼"	8	203.20	9.24	234.7	75 psi	9.80	248.9
¼"	8⅞	219.08	10.12	257.1	75 psi	13.32	338.3
¼"	10	254.00	11.50	292.1	75 psi	15.29	388.4
¼"	10¾	273.05	12.41	315.2	75 psi	17.18	436.4
¼"	12	304.80	13.66	347.0	75 psi	19.05	483.9
¼"	12¾	323.85	14.41	366.0	75 psi	20.15	511.8
¼"	14	355.60	15.84	402.3	75 psi	25.20	640.1
¼"	16	406.40	17.84	453.1	75 psi	30.85	783.6
¼"	20	508.00	22.42	569.5	75 psi	43.30	1099.8
¼"	24	609.60	26.42	676.1	75 psi	53.80	1366.5

NovaTransfer 150psi

Tube	ID inches	ID mm	OD inches	OD mm	Working Pressure	Weight	
						lb/ft	Kg/m
¼"	2	50.80	2.97	75.4	150 psi	1.98	50.3
¼"	2⅝	60.33	3.36	85.3	150 psi	2.32	58.9
¼"	2½	63.50	3.49	88.6	150 psi	2.42	61.5
¼"	2⅞	73.03	3.92	99.6	150 psi	2.98	75.7
¼"	3	76.20	4.04	102.6	150 psi	3.09	78.5
¼"	3½	88.90	4.54	115.3	150 psi	3.52	89.4
¼"	4	101.60	5.04	128.0	150 psi	3.96	100.6
¼"	4½	114.30	5.65	143.5	150 psi	5.03	127.8
¼"	5	127.00	6.22	158.0	150 psi	5.82	147.8
¼"	6	152.40	7.35	186.7	150 psi	7.75	196.9
¼"	6⅞	168.28	7.97	195.6	150 psi	8.71	221.2
¼"	8	203.20	9.37	238.0	150 psi	10.80	274.3
¼"	8⅞	219.08	10.1	258.1	150 psi	13.71	348.2
¼"	10	254.00	11.61	294.9	150 psi	15.72	399.3
¼"	10½	273.05	12.41	315.2	150 psi	17.31	439.7
¼"	12	304.80	13.66	347.0	150 psi	19.20	487.7
¼"	12¾	323.85	14.55	369.6	150 psi	21.97	558.0
¼"	14	355.60	16.00	406.4	150 psi	27.18	690.4
¼"	16	406.40	18.00	457.2	150 psi	33.09	840.5
¼"	20	508.00	22.62	574.5	150 psi	43.70	1110.0
¼"	24	609.60	26.76	679.7	150 psi	57.28	1454.9

Slurry King Hose

Slurry King 5000

A tough versatile alternative to engineered hoses or steel pipe installations. This unique system of quick installation hose (up to 14" ID), eliminates excessive down time due to long deliveries for custom length hose. Stock the bulk hose and couplings. Simply cut the hose to length, attach the couplings and install the finished assembly in minutes. Slurry King is available in three tube compounds to maximize service life.

I.D.	O.D.	Lining Thickness (in)	MBR (in)	Max Prod Lgth(ft)	WP psi	WT lbs/ft
2	3.00	$\frac{3}{16}$	12	100	150	2.0
3	4.50	$\frac{3}{8}$	14	100	150	4.0
4	5.25	$\frac{3}{8}$	20	100	150	5.4
5	6.45	$\frac{3}{8}$	26	60	150	8.0
6	7.50	$\frac{3}{8}$	30	60	150	9.4
8	9.50	$\frac{3}{8}$	69	40	150	12.1
10	11.50	$\frac{3}{8}$	79	40	150	14.8
12	13.75	$\frac{3}{8}$	99	40	150	18.8
14	16.00	$\frac{3}{8}$	119	40	150	26.0



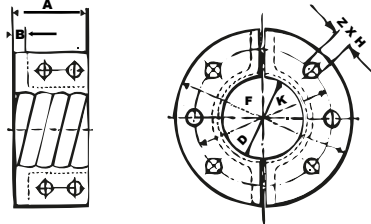
Tube Options:

NovaWear - Y Part # 5000YG
NovaWear - R Part # 5000RG
NovaWear - T Part # 5000TG

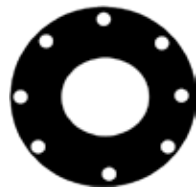
Slurry King Flanges & Gaskets

Slurry King Flanges

Aluminum split flanged specifically designed to provide a safe tight seal on Slurry King 5000 hose.



Size"	Part No
2	7SKFGASK02
3	7SKFGASK03
4	7SKFGASK04
5	7SKFGASK05
6	7SKFGASK06
8	7SKFGASK08
10	7SKFGASK10
12	7SKFGASK12
14	7SKFGASK14



Slurry King Gaskets

Designed to fit and seal with mating 50# drilled flanges

'D' ID Inches	'A' Inches	'B' Inches	'K' Inches	'P' Inches	'Z' Inches	'H' Inches	Approx/ WT/LBS
2	$3\frac{11}{32}$	$\frac{5}{8}$	$4\frac{3}{4}$	6	4	$\frac{3}{4}$	3.30
2½	$3\frac{5}{16}$	$\frac{5}{8}$	$5\frac{1}{2}$	7	4	$\frac{3}{4}$	4.40
3	$3\frac{5}{16}$	$\frac{5}{8}$	6	$7\frac{1}{2}$	4	$\frac{3}{4}$	4.40
4	$3\frac{5}{16}$	$\frac{5}{8}$	$7\frac{1}{2}$	9	8	$\frac{3}{4}$	6.60
4½	$4\frac{1}{8}$	$\frac{5}{8}$	$8\frac{1}{2}$	10	8	$\frac{7}{8}$	7.70
5	$4\frac{1}{8}$	$\frac{5}{8}$	$8\frac{1}{2}$	10	8	$\frac{7}{8}$	7.70
6	$4\frac{1}{2}$	$\frac{1}{16}$	$9\frac{1}{2}$	11	8	$\frac{7}{8}$	8.80
8	$5\frac{7}{8}$	$\frac{3}{4}$	$11\frac{3}{4}$	$13\frac{1}{2}$	8	$\frac{7}{8}$	13.20
10	$6\frac{7}{8}$	$1\frac{1}{8}$	$14\frac{1}{4}$	16	12	1	25.40
12	$7\frac{11}{16}$	$1\frac{1}{8}$	17	19	12	1	30.90
14	$7\frac{11}{16}$	$1\frac{1}{8}$	$18\frac{3}{4}$	21	12	$1\frac{1}{8}$	35.30

Dredge Hoses

NovaFlex® has developed a series of custom designed hose styles to meet the demanding requirements of dredging applications. There is NovaDredge Suction, NovaDredge Discharge (available in both a hardwall and softwall version) NovaDredge Sleeve and NovaDredge Gimbal. These hoses are available in various wear resistant tube configurations, based on the specific dredge requirement.

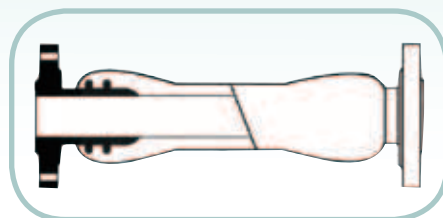
NovaDredge Suction 5333

I.D.	Tube Gauge	MBR"	WP (psi)	Vac (HG)
8	3/8	48	50	29
8 5/8	3/8	52	50	29
10	1/2	60	50	29
10 3/4	1/2	65	50	29
12	1/2	72	50	29
12 3/4	1/2	77	50	29
14	3/4	84	50	29
16	3/4	96	50	29
18	3/4	108	50	29
20	1	120	50	29
24	1	144	50	29

NovaFlex® 5333 NovaDredge Suction

Hardwall design with the most rugged tube compound found in the rubber industry NovaWear-YG.

This is a maximum cut, gouge, tear and abrasion resistant tube. The hose design is commonly used for both suction and boom/stinger applications. NovaDredge Suction is built with a helix wire spaced for flexibility and full flow ends for maximum wear resistance.



NovaFlex® NovaDredge Discharge

Built in both hardwall and soft wall design. Typically used in stern discharge applications.

NovaDredge 5334 Hardwall

Hardwall design has a rugged tube with a heavy steel wire helix designed to be used where the bend radius needs to be controlled. This hose holds its shape and handles end pull very well. Tube thickness typically is 3/8" to 1".

NovaDredge Discharge - Hardwall

I.D.	Tube Gauge	MBR"	WP (psi)	Vac (HG)
8	3/8	48	150	29
8 5/8	3/8	52	150	29
10	1/2	60	150	29
10 3/4	1/2	65	150	29
12	1/2	72	150	29
12 3/4	1/2	77	150	29
14	3/4	84	150	29
16	3/4	96	150	29
18	3/4	108	150	29
20	1	120	150	29
24	1	144	150	29

NovaDredge 5335 Softwall

Softwall design has the same tube but has no helix. This hose has a strengthened carcass with extra reinforcement. This design is used where kinking is unavoidable.

NovaDredge Discharge - Softwall

I.D.	Tube Gauge	MBR"	WP (psi)	Vac (HG)
8	3/8	48	50	29
8 5/8	3/8	52	50	29
10	1/2	60	50	29
10 3/4	1/2	65	50	29
12	1/2	72	50	29
12 3/4	1/2	77	50	29
14	3/4	84	50	29
16	3/4	96	50	29
18	3/4	108	50	29
20	1	120	50	29
24	1	144	50	29

Dredge Hoses

NovaFlex® 5331 NovaDredge Sleeves

Typically used on discharge piping applications to connect dredge pipe sections. This hose is connected with various end connections or through the use of external clamps.



NovaDredge Sleeves 5331

I.D.	O.D.	Tube Gauge	WP psi	WT LBS/FT
4½	5.73	¾	150	5.45
6	7.25	¾	150	7.51
6¾	8.017	¾	150	9.26
8¾	10.19	¾	150	12.97
10¾	12.50	½	150	17.83
12¾	14.55	½	150	22.80
14	16.04	½	150	27.21
16	18.04	½	150	30.82

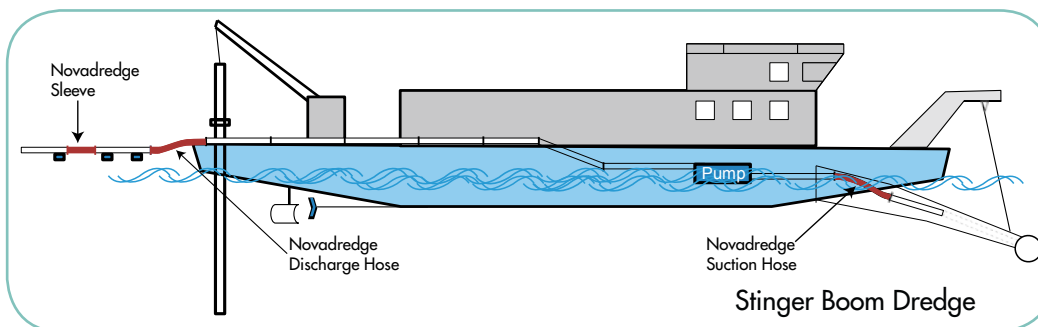
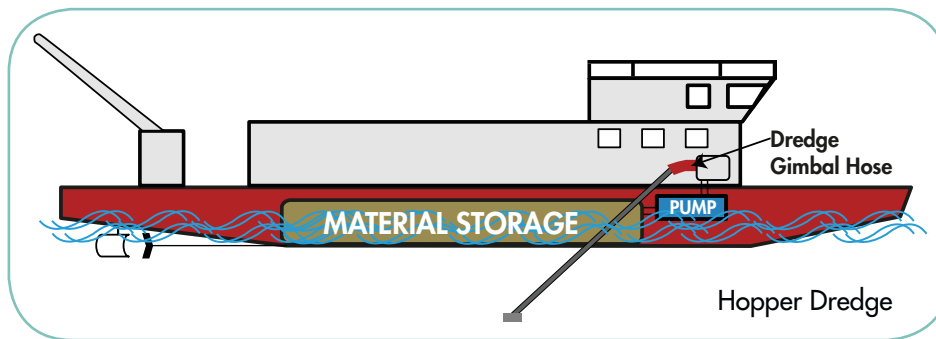
NovaFlex® 5335 NovaDredge Gimbal

Typically used on vacuum arms found on hopper dredges. Can also be utilized where extra flexibility is required. This type of hose is custom designed for each application. The gimbal design provides maximum flexibility. The thick tube is designed to maximize the longest safe service life possible. (Can be used in applications that require a smaller bend radius than standard helix wire hose can provide.)



NovaDredge Gimbal 5335

I.D.	Tube Gauge	MBR"	WP (psi)	Vac (HG)
8	¾	24	50	29
8¾	¾	35	50	29
10	½	40	50	29
10¾	½	43	50	29
12	½	48	50	29
12¾	½	51	50	29
14	¾	56	50	29
16	¾	64	50	29
18	¾	72	50	29
20	1	80	50	29
24	1	96	50	29



NovaFlex® Engineered Systems

Prior to any application of the information within, please read carefully the following information:

This catalogue is a guide for use in selecting the correct hose for the correct application. It contains warnings, reference directions and directions for the safe use of industrial hose. All guidelines should be clearly understood before specifying or using any NovaFlex® product. Failure to follow recommended application information and recommended procedures may result in premature failure, resulting in bodily injury or property damage. Contact NovaFlex® or your local NovaFlex® distributor for assistance.

Coupled Assemblies

NovaFlex® hoses have specific working pressures published. Never exceed the working pressure for any reason. The choice of coupling and the attachment method may cause the assembly to have a lower working pressure because the couplings may not be able to take the hose to its rated burst pressure.

Chemical Hose

- Always consult the NovaFlex® Chemical Resistance Chart to verify chemical compatibility. (See: www.novaflex.com)
- Do not use chemicals at higher temperatures than shown on the Chemical Resistance Chart. Higher temperatures increase the effect of chemicals on hose tubes. If temperatures above +125° F (+52° C) are applicable, please consult NovaFlex®.

Proper Care Use & Maintenance

See NovaFlex® Correct Care and Maintenance Guide form no 2003-1
(See: www.novaflex.com).

It is impossible to test NovaFlex® products under all of the conditions to which they might be subjected in the field. It is therefore the buyer and/or end users' responsibility to test all products under conditions that duplicate service conditions prior to installation. Due to continuous improvements, technical data is subject to change without notice.



NovaFlex® recommends the use of NAHAD hose assembly guidelines.

Terms and Conditions of Sale

The items described in this document and other documents provided by NovaFlex® Hose Inc., NovaFlex® Industries Inc., Z-Flex U.S. Inc., their subsidiaries and their authorized representatives ("Seller") are available for sale at prices established by Seller. An order from any customer ("Buyer") shall be governed by all of the following terms and conditions of sale ("Terms and Conditions"). Upon Seller's acceptance of Buyer's purchase order the Terms and Conditions from apart of the agreement between Buyer and Seller. All goods available for sale are referred to as "Products". The Terms and Conditions are also available on our website at www.novaflex.com.

Prices; Price Adjustments; Payments. Prices stated in this document are valid for 30 days. Minimum purchase per order is \$250. After 30 days, Seller may change prices to reflect any increase in its costs resulting from state, provincial, federal or local legislation, price increases from its suppliers, or any change in the rate, charge, or classification of any carrier. The prices in this document do not include any sales, use, or other taxes unless so stated. Buyer shall be responsible for any present or future sales, exercise or similar tax applicable to the sale or use of the Products. Unless otherwise specified by Seller, all prices are F.O.B. Seller's facility, and payment is due 30 days from the date of invoice. After 30 days, Buyer shall pay interest on any unpaid invoices at the rate of 1.5% per month.

1. Delivery Dates; Title and Risk; Shipment. All delivery dates are approximate and Seller shall not be responsible for any damages resulting from any delay due to a cause beyond its control. Regardless of manner of shipment, title to any Products and risk of loss or damage shall pass to Buyer upon tender to the carrier at Seller's facility. Unless otherwise stated, Seller may exercise its judgment in choosing the carrier and means of delivery. At Seller's option carrier charges shall be prepaid and invoiced to Buyer. A \$5.00 handling charge will be added to all UPS shipments. No deferment of shipment at Buyers' request beyond the respective dates indicated will be made except on terms that will indemnify and hold Seller harmless against all loss and additional expense. Buyer shall be responsible for any additional shipping charges incurred by Seller due to Buyer's changes in shipping or product specifications.

2. Buyer Responsibility and Acceptances. Buyer, and user, if different, through their own analysis and testing are solely responsible for making the final selection of Products and assuring that all performance, endurance, maintenance, safety and warning requirements are met. User must analyze all aspects of the application in the field and follow applicable industry standards and Product information. Adequate testing in actual service conditions must be carried out by Buyer and/or user to establish definite suitability for end use. If Seller suggests Products for an application based on data, drawings, designs, diagrams, specifications or other communications ("Information") provided by Buyer or user, then Buyer and user are responsible for determining that the Information is suitable for use of the Product in the application. Submission of an order for production quantities of a Product following receipt of a final version of a prototype is (a) Buyer's acceptance of the prototype as meeting all of Buyer's requirements as set out in the Information supplied by Buyer and, (b) Buyer's acceptance of the Products based on the prototype, provided the Products are manufactured within Seller's standard tolerances.

3. Returns, Cancellations and Changes. Returns shall not be accepted. Orders shall not be subject to cancellation or

change by Buyer for any reason, except with Seller's written consent on terms which protect Seller from any loss. Seller may change product features, specifications, designs and availability with notice to Buyer.

4. Claims. Buyer shall promptly inspect all Products upon delivery. No claims for corrections or deductions from invoices will be allowed unless reported to Seller within 30 days of delivery.

5. Contingencies. Seller shall not be liable for any default or delay in performance if caused by circumstances beyond the reasonable control of Seller.

6. Warranty. Seller warrants that the Products sold hereunder shall be free from defects in material or workmanship for a period of twelve months from the date of delivery to Buyer. This warranty is made only to Buyer and does not extend to anyone to whom Products are sold after purchased from Seller. The prices charged for Seller's products are based upon the exclusive limited warranty stated above, and upon the following disclaimer: **DISCLAIMER OF WARRANTY:** This warranty comprises the sole and entire warranty pertaining to Products. Seller disclaims all other warranties, express and implied, including merchantability and fitness for a particular purpose.

7. Limitation of Liability. For a period of 30 days from delivery Seller will, upon notification, at its option, repair or replace a defective product, or refund the purchase price. In no event shall Seller be liable to Buyer for any special, indirect, incidental or consequential damages arising out of, or as the result of, the sale, delivery, non-delivery, servicing, use or loss of use of the Products or any part thereof, or for any charges or expenses of any nature incurred without Seller's written consent, even if Seller has been negligent, whether in contract, tort or other legal theory. In no event shall Seller's liability under any claim made by Buyer exceed the purchase price of the Products.

8. Improper Use and Indemnity. Buyer shall indemnify, defend, and hold Seller harmless from any claim, liability, damages, lawsuits, and costs (including lawyer's fees), whether for personal injury, property damage, patent, trademark or copyright infringement or any other claim, brought by or incurred by Buyer, Buyer's employees, or any other person, arising out of: (a) improper selection, improper application or other misuse of Products purchased by Buyer; (b) any act or omission, negligent or otherwise, of Buyer; (c) Seller's use of Information furnished by Buyer to manufacture Products; or (d) Buyer's failure to comply with the Terms and Conditions. Seller will not indemnify Buyer under any circumstances except as otherwise provided.

9. Limitation on Assignment. Buyer may not assign its rights or obligations under this agreement without the prior written consent of Seller.

10. Entire Agreement. This agreement contains the entire agreement between the Buyer and Seller with respect to the subject matter of this agreement and supersedes all prior agreements, understandings, negotiations and discussions whether written or not.

11. Waiver. Failure to enforce any provision of this agreement will not waive the provision nor prejudice Seller's right to enforce the provision in the future.

12. Governing Law. This agreement shall be governed by and construed in accordance with the laws of the State of New Hampshire.

Custom Hose for Industry

NovaFlex® is proud to be one of the largest **Custom Hose** manufacturing companies in North America and Europe.

The NovaFlex Group® is a privately held company committed to continuous advancement in hose and connector solutions. NovaFlex® has one of the broadest product ranges available in the hose and ducting marketplace, as well as in the HVAC, Industrial Venting and Hose Industries and in Commercial Exhaust Venting Systems.

Design Capabilities

Based on the specifications of the application, NovaFlex® is able to design virtually any required feature into a product.

With close client consultation, the process begins with knowledgeable field staff evaluating the application, followed by hose designers and experienced hose craftsman developing and manufacturing an appropriate hose. With this process, custom solutions for every material transfer requirement can be provided.

Typical Industries Served

Chemical Plants

Concrete Production

Dock (ship & barge operations)

Dredging Operations

Mining

Petroleum Processing

Power Plants

Sand & Gravel Operations

Smelting Facilities

Steel Mills

Canada

Ajax, Ontario

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Fax: 905.686.8349

U.K.

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Fax: 44(0)151.334.7145

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Burlington, NC

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Fax: 336.578.5554

800.334.4270

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